SEMINAR ON THE NATURE OF AND RATIONALE FOR THE PROTECTION OF PLANT VARIETIES UNDER THE UPOV CONVENTION

Buenos Aires, November 26 and 27, 1991

Organized by

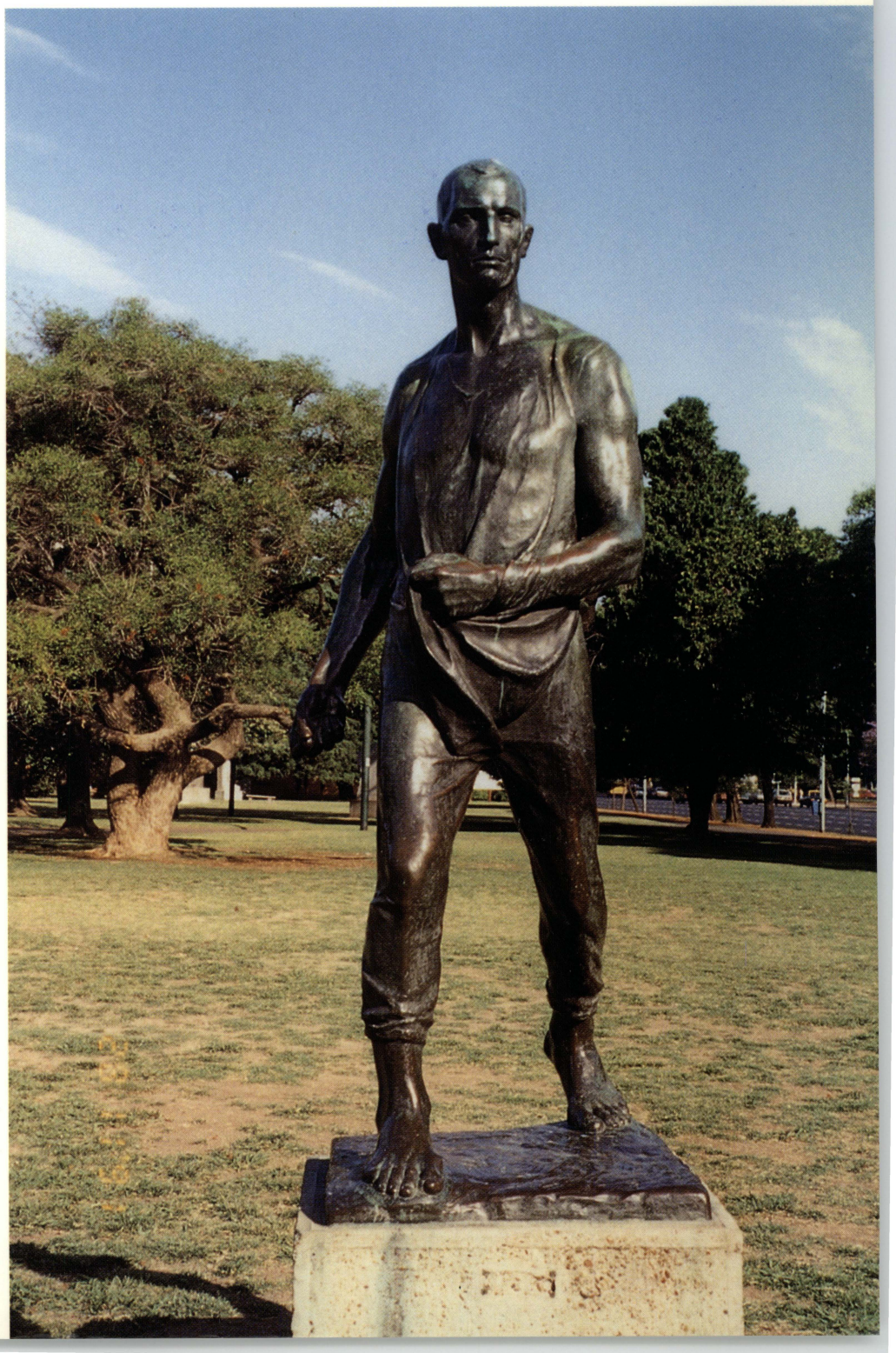
the International Union for the Protection of New Varieties of Plants

in Cooperation with

the Secretariat of Agriculture, Livestock and Fisheries of Argentina

and with the Assistance of

the Ministry of Agriculture, Fisheries and Food of Spain



UPOV

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Cover: "El Sembrador" (The Sower), a figure sculptured made by Constantin Emile Meunier (1831-1905) and erected in 1936 in Justo José de Urquiza Square, in Buenos Aires.

(Photo: José María Elena Rosselló)

FOREWORD

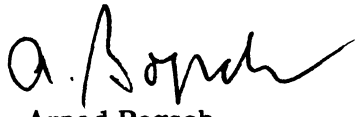
The International Union for the Protection of New Varieties of Plants (UPOV), in cooperation with the Secretariat of Agriculture, Livestock and Fisheries of Argentina and with the financial assistance of the Ministry of Agriculture, Fisheries and Food of Spain, organized a Regional Seminar on the Nature of and Rationale for the Protection of Plant Varieties under the UPOV Convention in Buenos Aires on November 26 and 27, 1991.

The Seminar was held at the Buenos Aires Grain Exchange; the practical arrangements had been made by the Secretariat of Agriculture, Livestock and Fisheries of Argentina and the Argentine Association for the Protection of New Plant Varieties (ARPOV). I should like to take this opportunity to renew UPOV's appreciation and thanks for their contribution to a successful event, and also for the warm welcome and hospitality extended to all the participants and speakers. Special thanks go to Mrs. Adelaida Harries and Messrs. Héctor Laurence, Héctor Ordóñez, Luis Quintero and Norberto Severo.

The Seminar was the first of its kind in Latin America. Its objective was to afford participants, especially government officials who are or would be involved in the formulation and implementation of policies concerning plant breeders' rights, an opportunity to understand better the basic principles, the functioning and the wide-ranging benefits of a plant breeders' rights system based on the UPOV Convention. To this end, the Government of Spain provided funds to cover the travel and daily subsistence expenses of one government official from each invited country. This foreword provides an opportunity to express once again UPOV's appreciation for the contribution made by the Government of Spain in the form of human resources and financial means.

The Seminar considered the following: the history of the UPOV Convention and the rationale for plant breeders' rights; the basic provisions of the UPOV Convention; the concept of variety and the examination of varieties; the experience and views of managers and users of the plant variety protection system; finally, genetic resources and plant breeders' rights, then a highly topical subject in view of the United Nations Conference on Environment and Development (UNCED) which was to be held subsequently, in June 1992, in Rio de Janeiro.

This publication contains the texts of the addresses and presentations given by the speakers and other relevant information.



Arpad Bogsch
Secretary-General
International Union for the Protection
of New Varieties of Plants

Geneva, December 1993

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OPENING ADDRESS

by

Mr. Marcelo Regúnaga,
Secretary of Agriculture, Livestock and Fisheries of Argentina

Mr. President of the Council of UPOV, Mr. Ricardo López de Haro y Wood,
Mr. Vice-President of the Council of UPOV, Mr. Bill Whitmore,
Mr. Vice Secretary-General of UPOV, Mr. B. Greengrass,
Distinguished representatives of friendly countries,
Ladies and Gentlemen,

I wish to state at the outset that it is a great challenge and honor for the Secretariat of Agriculture, Livestock and Fisheries to organize this Seminar for this area--the area of seeds and intellectual property--is is one of those that are considered as strategic in the policy that are being implemented in Argentina. Strategic, in the sense that the world market--which is at the background of our present agricultural policy--requires continuous improvements in the quality and the health status of the products if they are to find their way onto that market; the improvement of yields is a further challenge currently facing us.

These aspects of the technological development of agriculture become of fundamental importance in the context of the present economic policy. Competitiveness, added value, improved quality, these are the factors which enabled us to enter dfifficult markets, markets which are demanding and increasingly competitive at international level. Genetics is one of the fundamental instruments which permitted Argentina to achieve the increases in competitivity of the last decades. And we have no doubt that genetics will continue to be one of the keys to the technological development of our country in the decades to come.

Argentina has been making important investments for quite some time, both in the public and the private sector, to develop this important area of knowledge. Significant efforts are being made both at the National Institute of Agricultural Technology (INTA) and in private enterprises to place Argentina at a high level on the international market. But these efforts will be of no use, in the private and in the public sector as well, if there is no legal, normative instrument to guarantee adequate protection for the research and development undertakings. And not only an adequate protection, but also an adequate follow-up in terms of quality and certification and, as I mentioned before, protection of intellectual property.

Many of these activities have taken place in Argentina already long ago, but I will mention a number of landmark events in the insertion of our country into the worldwide system of standards in the field of seeds.

Concerning the quality norms, for which our country has made important efforts in recent years, we could mention that we joined the International Seed Testing Association (ISTA) in 1981, accepted the certification norms of the Organisation for Economic Co-operation and Development (OECD) in 1982 and, finally--with great pleasure--that we took during the 1991-92 campaign the steps that are necessary to adhere to the Union, to UPOV.

The objective of our Secretariat's policy in the field of seeds has been, in relation to the last-mentioned step, to amend the implementing decree to our Seed Law to bring it closer to the conditions and standards required at international level, by UPOV, in the field of intellectual property; the second fundamental objective is to restructure the National Seed Service and to transform it into a Seed Institute that responds to the requirements of the time and the style that we try to give to the economic policy in general and the policy in this area in particular. A modern, decentralized institute that enjoys great financial autonomy and is not bureaucratic. We are currently making the administrative adjustments that are necessary to seek approval of the final decree which will enable us to create that institute.

Finally, we now have a legal framework that responds to the main requirements of our seed policy, of quality, certification, intellectual property; we are about to have a modern Seed Institute replacing the current National Seed Service. With all this and the research and development programs that we are implementing, we hope to be up to the standards of the times so that genetics may become one of the fundamental factors of progress for the agricultural sector of our country.

To conclude, I wish to thank UPOV, the Ministry of Agriculture, Fisheries and Food of Spain and the Association of Argentine Seed Producers, and also the officials of the Secretariat of Agriculture, for all the efforts which they have made to organize this Seminar which I have the pleasure to declare open.

ADDRESS TO THE INAUGURAL SESSION

by

Mr. Ricardo López de Haro y Wood,
President of the UPOV Council

and

Technical Director of Seed Certification and the Register of Varieties,
National Institute of Seeds and Nursery Plants, Spain

I should like to start by telling you of the pleasure that it gives me to be in a country of Latin America, in this instance Argentina, as President of the Council representing the International Union for the Protection of New Varieties of Plants (UPOV), but without overlooking the fact that I am a Spaniard, which in a certain way, I know, brings me much closer to those present here. Although accustomed to taking part in many international gatherings, both within the purview of this organization and also in other forums in which Spain takes part, I have to tell you sincerely that I have always come up against communication problems, albeit not irretrievable ones, but which in one way or another have made relations difficult with the various people I have had dealings with, owing mainly to language problems.

On this occasion my pleasure is twofold, firstly because I am delighted to spend a few days in your midst, in the company of people that I have known for a long time, and secondly because I know that, even though we may have different conceptions of the subject matter that we are going to apply ourselves to over the next few days, we are certain to understand each other perfectly. It is a great pleasure to be able to address myself to you in my own language and to be sure that all those listening will be able to follow. It is not the first time that I have visited the countries of Latin America; they have been known to me for a long time, and that indeed is why I am so pleased to be back once again. I trust that we will be able not only to make the most of the opportunities that this Seminar gives us of exchanging opinions, but also to enjoy the cordiality of our Argentine colleagues, which I am certain will ensure that we feel as if we were in our own homes. I am further pleased to be able to take part in the first seminar on plant variety protection to be held in Latin America, coincidentally at a time when the honor of being President of the UPOV Council has been conferred on me. Perhaps this will be a great opportunity for closer relations to be achieved between UPOV and the countries of this area; as yet they have not materialized, but no doubt they will thanks to the initiative taken by both the Argentine Government and the Uruguayan Government, those two countries being the first to have almost finally entered into close relations with UPOV, whereupon the system may be extended to other countries of this region; I am well aware that this is the objective of UPOV and all its member States at the present time, and I trust that in one form or another it is also that of Latin America.

I also wish to record UPOV's gratitude to the Argentine Government for the opportunity that it has given us of organizing this Seminar, but without forgetting to mention the involvement of Spain in the holding of the event, which is an illustration of our country's interest in drawing the countries of Latin America towards the Union, as we have the firm conviction that the results of such a development will be beneficial to all.

Moving on now to the reasons for this Seminar and the aims pursued in holding it, I am going to pass on to you a number of thoughts on the significance and importance of plant breeders' rights.

I take it to be universally accepted that one of the aims pursued by modern society is the well-being of its members, a well-being which, while this may be considered a subjective interpretation, certain countries, above all the industrialized ones, have already achieved, whereas other undeveloped or developing countries are still following the tortuous and difficult path towards it. The achievement of this basic aim is undoubtedly dependent on a set of different circumstances, including the responsibility of those in government, greater or lesser potential wealth and available resources, the ability of politicians to set out precise objectives, and ultimately, in the majority of cases, the success of citizens in electing the right politicians. In any event, well-being starts with something as simple as the elimination of hunger. The factors governing an effective food policy are many, but there is no doubt that the most important and perhaps the fundamental one, on which it depends very directly, is the country's agricultural productivity. The first step towards the attainment of a set of coherent agricultural policy objectives is to succeed, as far as possible, in providing oneself with one's own basic food products for human consumption, and ultimately of becoming self-sufficient and not dependent on other countries. This is a critical objective, and generally everything is done so that it may be achieved as soon as possible. The second step is to improve the quality of the goods intended for consumption, but on condition that minimum requirements have first been met. Clearly such measures have to be complemented with other foreign trade measures, this being determined to a greater or lesser extent by agricultural and climatic circumstances, which in certain cases may make the domestic production of certain commodities impossible. So a policy of social well-being ultimately depends very directly on good agricultural policy, and agricultural policy is geared to productivity, independently of the other connotations that I have just mentioned. Confining myself therefore to what constitutes agricultural production and leaving aside any thoughts on livestock production, which probably would also have a bearing on what we are talking about, especially in the future, but which is not relevant to the present occasion, I wish to emphasize the importance of the use of varieties of the various species that can be grown in a particular country. There is no doubt that varieties and their continuing development, which always concentrates on the achievement of greater production and quality, will be an important influence on agricultural productivity. Nowadays the more developed countries, where varieties offering quite high levels of productivity have been achieved, are focusing their work on improving the quality of the end products derived from the varieties. There are other countries in which development levels have not attained quite the same heights, and where the most important thing is to deal first with the problems of production in the quantitative sense, leaving for later the idea of quality, which could be considered at the same time as the new technology available. So in either case the importance of the varieties of the various cultivated species is crucial; it is varieties, their improvement and their constant replacement with new creations that will be instrumental in bringing about the increases in both productivity and quality that I was referring to earlier.

The part played by new varieties in productivity increases is a proven fact in many countries. Various studies conducted in Europe have shown clearly that research directed towards the breeding of new varieties is one of the areas of activity most relevant to the achievement of substantial growth in production. Let me give you some examples. An interesting study carried out in the United Kingdom, more specifically at the National Institute of Agricul-

tural Botany, has demonstrated the contribution to greater productivity made by new varieties of wheat and barley, species which as you probably know occupy a high percentage of the area under cultivation in that country. The study revealed that, over a reference period of 30 years, wheat and barley yields increased by approximately 94% and 67% respectively. Analysis of the various factors that contributed to these increases has shown that, in the case of wheat, 56% was due to the use of new varieties, whereas in the case of barley the figure was 32%. The balance of the percentages was made up of factors different from the variety input, such as new growing techniques, improvements in seed distribution and fertilization, new and more efficient disease treatments, etc. Similar studies conducted in France have come to more or less the same conclusions, revealing that it could be claimed without serious risk of error that about 50% of the increases in yield could be attributed to the use of more productive varieties. With regard to other species, including those in which seed production techniques have developed substantially through the use of hybrids, for instance maize and sunflower, while I do not in fact have information on the subject, it does seem clear that the trend towards productivity increases, again over periods of 20 or 30 years, has been even more spectacular than in the cases that I have just mentioned. We are not concerned here with a species-by-species analysis of what has happened over long periods of time, so I shall not go any further into this, but what I do want to bring to the attention of all of you is the importance, as I said before, of plant brreding to the increased size of harvests, but without of course overlooking the fact that, when in the course of time a variety improvement takes place, it is apparent not only in the yield factor but also in other factors such as improved quality of the end product, and also resistence to the various pathogens which are now presenting a serious problem in all regions of the world.

Using as a basis the information available to me from the work undertaken in France and the United Kingdom, I carried out a study in my country in 1987 which covered the main agricultural species in cultivation, including winter cereals, maize, sunflower, cotton, potato and beet, totalling about 14 species. Using a period of 20 years as a reference I studied, from the statistics available, the increases in yield that had occurred in those species during the reference period. Having calculated the increases I deduced, on the basis of the work carried out in the two countries mentioned, what percentage of the increases would, if of course the circumstances were the same in Spain, be due to the introduction of new varieties; what I found was that the increased annual yield in this group of species as a result of the use of new varieties represented approximately 46 million dollars a year. Just imagine the figure that we could achieve by extrapolation to every single cultivated species! The results would be truly spectacular, affording a ready understanding of the importance of research in this area of plant breeding, and of the economic benefits that it makes possible. One thing that clearly follows from these conclusions is that the breeding of new plant varieties is becoming more and more important to the human race. We are aware that food is becoming scarce in the world, that the alarming rate of population growth is not being matched by an adequate increase in arable land at our disposal, which means that everything possible has to be done to improve our crops through the breeding of varieties that are more productive, have better quality characteristics and of course are resistant to diseases, which develop just as steadily and can sometimes prevent the achievement of the desired yields. Now the real driving force in the creation of new plant varieties are the plant improvers or breeders, who have to be given the necessary attention and protection that will prevent them from becoming discouraged and enable them to carry on their improvement work with the necessary assurance. New varieties are the result of considerable investment and man's creative ability, sometimes through the

personal work of individuals and sometimes that of small or larger undertakings, but the purpose is the same, namely the production of new cultivars that give better results than the old ones. New plant varieties cost time and money, while the breeders have to have large tracts of land at their disposal for their experiments, they have to build glasshouses and laboratories and procure the other means necessary for the work that they do, and we therefore have to be aware that work costing so much time and money will only have any meaning if the efforts involved are adequately rewarded. The only means of protecting breeders is by granting them a right by virtue of which, for a specified period and for commercial purposes, only they may produce or sell propagating material of their new plant varieties or authorize others to produce it under the appropriate exploitation licenses.

According to the experience of the last 30 years, based on what has happened in a number of countries, plant breeding can actually be stimulated by the conferment on breeders of the above-mentioned legal protection.

A legal framework in the protection of new plant varieties can benefit a country in a great many ways, which are not confined to plant improvers alone.

The rights of persons who do research on new varieties are protected, so that, at least for a specific period of years, they have exclusive rights in the propagation and exploitation of their new varieties, and are given some reward for their contribution to technological development in agriculture.

Variety researchers are given a status comparable to that of people who devote themselves to other areas or activities like industrial property, literary and artistic property, etc., for whom such rights have long existed in the majority of countries; it would be unfair if one were not to give the same treatment to those who engage in plant variety research as to those who do other kinds of creative work.

Private research is stimulated, and investment in plant breeding by official bodies, drawing on the appropriate research budgets, is promoted, so that private initiative may be backed up by an increase in the creative content of a new variety, which in turn will dispel the misgivings that researchers may have in the absence of any assurance that they will receive the just reward to which they are entitled.

The exchange between countries of recently created varieties will likewise be stimulated, and that will unquestionably have a favorable effect on the interests of each party. At present this exchange is a cause of distrust owing to the suspicions harbored by breeders, who are afraid of not receiving their adequate reward for want of the requisite plant variety protection in the country to which they would be sending their varieties. Such exchange contributes actively to the availability of more and better-quality germplasm of the various species, which could be of the utmost benefit to the creation of new varieties.

Contradictory though it may seem, there would be a drop in the payment of royalties to breeders from other countries due to the creation of national varieties. On this subject I am in a position to tell you that, during the 14 years that protection has been available in Spain, there has been a noteworthy increase in new national varieties at the expense of foreign varieties, and this is an obvious result of the new legal system having been put into operation.

The means would be provided of concluding agreements on plant breeding with other national or foreign institutions, and of course of becoming party to conventions like that establishing the International Union for the Protection of New Varieties of Plants, and this makes for a multitude of subsequent advantages in this protection system, as I shall explain in the talk that I am going to give you later.

These advantages that I have just mentioned as being the most striking, combined with the experience that I personally have gained in Spain and with what I know of events in other countries, lead me to the conclusion, to which I for one firmly adhere, that it is the legal framework for the protection of plant breeders' rights which, apart from placing those rights, as it should, in a position similar to those of researchers in other areas, is sure to bring about an increase in research in the field of plant breeding. That, without any doubt, will in turn effect a substantial increase in production levels of the various species grown in each country, and then there will be an increase in agricultural productivity, whereupon we shall eventually witness, in the not-too-distant future, the achievement of the aim of creating well-being that I mentioned at the start of this address, and which undoubtedly is the basis of a coherent economic policy that will improve the living standards of every citizen; this is a very important consideration above all in those countries where such levels of well-being have yet to be achieved, but where I am sure that in time, perhaps sooner rather than later, they will indeed be achieved.

I trust that we will be enabled in these few days to achieve understanding, to reconcile our ideas and in any event to ensure that our contacts will in the future have a favorable effect on all those who in one way or another will be taking decisions based on our recommendations.

F I R S T S E S S I O N

THE HISTORY OF THE UPOV CONVENTION AND THE RATIONALE FOR PLANT BREEDERS' RIGHTS

Speaker: Mr. André Heitz, Director-Counsellor, UPOV

THE UPOV CONVENTION - THE SCOPE OF PROTECTION AND ITS GENERAL PROVISIONS

Speaker: Mr. Barry Greengrass, Vice Secretary-General, UPOV

THE UPOV CONVENTION - THE CONCEPT OF VARIETY AND THE TECHNICAL CRITERIA OF DISTINCTNESS, UNIFORMITY AND STABILITY

Speaker: Mr. José María Elena Rosselló, Head of Section, Register of Varieties, National Institute of Seeds and Nursery Plants, Spain

THE UPOV APPROACH TO THE EXAMINATION OF APPLICATIONS FOR PROTECTION - PAST, PRESENT AND FUTURE

Speaker: Mr. Ricardo López de Haro y Wood, Technical Director of Seed Certification and the Register of Varieties, National Institute of Seeds and Nursery Plants, Spain

Chairman: Mrs. Adelaida Harries, Director General, National Seed Service, Argentina

THE HISTORY OF THE UPOV CONVENTION AND THE RATIONALE FOR PLANT BREEDERS' RIGHTS

> "I have the honor of addressing Your Excellency in order to submit to your consideration a Bill entitled 'Seeds and Phytogenetic Creations Law' which is to be an important and constructive instrument to improve and attain a greater and sustained development of our agriculture, of extraordinary consequence to the social and economic welfare of the country."

This is the introduction to the explanatory memorandum to the Law[1] which governs plant breeders's rights in Argentina and will enable that country to become a member of UPOV. It was written some 12 years after the adoption of the UPOV Convention by a handful of European States, at a time when UPOV comprised only six member States and had taken no special measure to promote its Convention. It is therefore appropriate to pay tribute to the initiative of the Argentinian Government before addressing the history of the UPOV Convention and to the men of vision who encapsulated in that sentence the rationale for a global plant varieties and seeds system, one element of which is the National Register of Cultivar Ownership.

PART I

THE HISTORY OF THE UPOV CONVENTION

The Ancient Art of Plant Breeding - The First Scientific Insights

Man has probably become a plant breeder with the very beginnings of agriculture. For a number of crops, the earliest archaeological remains show an evolution in relation to the wild ancestors that is inconsistent with a short period of domestication.[2] He has used--and maintained--varieties for millennia. In the case of vegetatively propagated species, varieties have been mentioned by Roman authors.[3] Yet it was only recently, in fact in this century, that the empirical notion of variety received a scientific basis. In the case of sexually reproduced species, the prerequisite was an understanding of the mating systems and of the laws of heredity. The latter were discovered by the Moravian Johann (or Gregor) Mendel, but the importance of his findings, published in 1865, was not captured by the scientific community of his time. They were to be 'rediscovered' in 1900 by K.E. Correns, E. von Tschermak and H. de Vries. The concept of pure line, to name but one type of variety, was

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1 No. 20.247 of March 30, 1973.

2 A general historical overview can be found in R.W. Allard, Principles of Plant Breeding, John Wiley & Sons, 1960, pp. 7 et seq.

3 For instance the lady-apple (appiana mala) by Plinius the Naturalist or the muscat grape (apiana uva), again by Plinius and by Columella.

then elucidated by W.L. Johannsen, a Danish biologist, in two famous publications of 1903 and 1926.[4] By that time, pure line selection was already a well-established breeding method. Mendel indeed owed his success, among other things, to the use of pure lines.

The Papal States: A Possible Precursor

As far as the protection of plant varieties is concerned, tradition attributes to the Papal States the role of forerunner. However, the Edict of September 3, 1833, concerning declarations of ownership of new inventions and discoveries in the field of art (technology) and agriculture was general in nature and has never been implemented.[5] It was to remain unique in its kind for almost a century.

For, to our knowledge, the question of rights in respect of plant varieties has not been addressed until the first requests were voiced by industry: around the turn of the century in the United States of America and, in Europe, in 1904 and 1911 at the Congrès pomologique de France (French Fruit Growing Congress).[6] It was also in 1911 that the question of the relevance of a sui generis form of protection was raised for the first time. But, for various reasons, the attention of the official circles could not be captured. In particular, it seems that the laudable intellectual effort of Mr. Martinet, the Director of the Swiss Federal Seed Testing Station of Mont-Calme near Lausanne, and Mr. Louis Martinet, a horticulturist of Lausanne, have not been followed up. The seeds thus sown were to bear fruit only some decades later.

The United States Plant Patent Act

The efforts in the United States of America were pursued much more vigorously. They led to the tabling, in 1906, of "A Bill to amend the laws of the United States relating to patents in the interest of the originators of horticultural products."[7] Further Bills were introduced in Congress in 1907, 1908 and 1910, but also without success.

The attempts to place the plant breeder on a similar footing as the inventor or author finally succeeded in 1930 with the enactment of the Townsend-Purnell Act, or 'Plant Patent Act,' now consolidated into Title 35 of the U.S.

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4 Ueber Erblichkeit in Populationen und reinen Linien, Gustaf Fischer, Jena, 1903; Elemente der exakten Erblichkeitslehre, Gustaf Fischer, Jena, 1926.

5 B. Laclavière, La protection des droits des obtenteurs sur les nouvelles espèces ou variétés de plantes et la Convention de Paris du 2 décembre 1961 pour la protection des obtentions végétales, Bulletin technique d'information des ingénieurs des services agricoles, No. 168 (April 1962).

6 Anonymous, De la protection des nouveautés fruitières et végétales, La Propriété industrielle (PI), 1911, pp. 191-192.

7 R.G. Adler, Können Patente und Pflanzenzüchterrechte nebeneinander bestehen?, Gewerblicher Rechtsschutz und Urheberrecht, Internationaler Teil (GRUR Int.), 1988, pp. 11-26.

Code (Patents) as Sections 161 to 164.[8] Although it is a part of the Patents Code, the Act, as consolidated in 1952 and amended in 1954, is a sui generis system which anticipates in many respects the UPOV Convention. It is therefore appropriate to consider its interesting features:

(i) The Act was restricted to asexually reproduced varieties on account of the belief that sexually reproduced varieties would not remain true to type, i.e. true to their description, i.e. stable.[9]

(ii) It excluded tuber-propagated plants--in practice potato and Jerusalem artichoke--from patentability, officially, because of the enforcement problems caused by the identity between the propagating material and the material sold

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8 The currently applicable text is as follows:

"Section 161. Patents for Plants

"Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of title. (Amended September 3, 1954, 68 Stat. 1190.)

"The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided.

"Section 162. Description, claim

"No plant patent shall be declared invalid for noncompliance with section 122 of this title if the description is as complete as is reasonably possible.

"The claim in the specification shall be in formal terms to the plant shown and described.

"Section 163. Grant

"In the case of a plant patent the grant shall be of the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced.

"Section 164. Assistance of Department of Agriculture

"The President may by Executive order direct the Secretary of Agriculture, in accordance with the requests of the Commissioner, for the purpose of carrying into effect the provisions of this title with respect to plants (1) to furnish available information of the Department of Agriculture, (2) to conduct through the appropriate bureau or division of the Department research upon special problems, or (3) to detail to the Commissioner officers and employees of the Department."

9 S.B. Williams, Jr., Intellectual Property Aspects of Plant Variety Genetic Engineering: View of an American Lawyer, in: Genetic Engineering and Plant Breeding, UPOV, 1983, pp. 23-46.

as food[10] and, unofficially, because of the then strongly-felt (and still widespread) fear of 'monopolies' in the field of basic foodstuffs (the reluctance to such monopolies was also material in the exclusion of sexually reproduced varieties from patentability).[11]

(iii) It included discoveries into the scope of the Act--a major innovation in view of the 'product of nature theory' which has been held against the patentability of varieties for decades[12] and is still playing a role today.[13] However, in line with the original intent of the lawmaker, "a wild variety, a chance find of the plant explorer"[14] was excluded through the reference to "a plant found in an uncultivated state."

(iv) It required from the applicant that he asexually reproduce the new variety to demonstrate the permanence of the characteristics of the plant claimed (and thus the homogeneity and stability of the variety). This is of perhaps anecdotical interest in the context of the recent debate on the definition of 'variety' that was to be inserted in the 1991 Act of the Convention and on the question whether a variety may be 'constituted' or merely 'represented' by a single plant.

(v) It set out the requirement of distinctness, without further precision, but the Congressional documents provided some guidance on this.[15] There was in particular a requirement for a 'clear distinction,' without any relation to

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10 Senate Report accompanying S. 4025, Report No. 315, 71st Congress, 2nd Session:

> "The bill excepts from the right to a patent the invention or discovery of a distinct and new variety of a tuber-propagated plant. The term 'tuber' is used in its narrow horticultural sense as meaning a short, thickened portion of an underground branch. It does not cover, for instance, bulbs, corms, stolons and rhizomes. Substantially, the only plants covered by the term "tuber-propagated" would be the Irish potato and the Jerusalem artichoke. This exception is made because this group alone, among asexually reproduced plants, is propagated by the same part of the plant that is sold as food."

11 E.M. Thomas (co-author), Outline of the History of the United States Patent Office, Journal of the Patent Office Society (JPOS), July 1936, No. 7.

12 The objection was still raised in 1961 in La Propriété industrielle / Industrial Property (IP) by L.E. Le Grand (L'invention en biologie - Les nouveautés végétales (ou animales) sont-elles brevetables?, pp. 30-36) some months before the adoption of the UPOV Convention.

13 Particularly in the field of microorganisms, where practitioners propose that a distinction be made between 'isolation' and 'discovery,' also to satisfy the requirement of non-obviousness or inventive steps.

14 Quoted by J. Rossman, The Preparation and Prosecution of Plant Patent Applications, JPOS, 1935, pp. 632-644.

15 Rossman, op. cit., quoted the following from the Senate Committee report No. 315, 71st Congress, 2nd Session, accompanying S 4015:

[Cont'd]

'inferiority' or 'superiority' since "experience has shown the absurdity of many views held as to the value of new varieties at the time of their creation," but with a reference to the "practice among botanists."

(vi) The novelty requirement is the same as for "utility patents,"[16] and is assessed essentially against prior knowledge, use, patenting or description.

(vii) The applicability of the non-obviousness requirement enshrined in Section 103 is uncertain.[17] Whereas the Supreme Court elaborated an interpretation requiring a value judgment in Yoder Bros. v. California-Florida

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[Footnote 15, cont'd]

> "In order for the new variety to be distinct it must have characteristics clearly distinguishable from those of existing varieties, and it is immaterial whether in the judgment of those of the Patent Office the new characteristics are inferior or superior to those of existing varieties. Experience has shown the absurdity of many views held as to the value of new varieties at the time of their creation.
>
> "... In order for a variety of plant to be distinct it is not necessary that it be a variety of a new species. A variety of plant may be patented if it is a new and distinct variety either of an existing or of a new species, or if it is an entirely new species of plant.
>
> "The characteristics that may distinguish a new variety would include among others, those of habit; immunity from disease; resistance to cold, drought, heat, wind, or soil conditions; color of flower, leaf, fruit, or stems; flavor; productivity, including everbearing qualities in case of fruits; storage qualities; perfume; form; and ease of asexual reproduction. Within any one of the above or other classes of characteristics the differences which suffice to make the variety a distinct variety, will necessarily be differences of degree. While the degree of difference sufficient for patentability will undoubtedly be a difficult administrative question in some instances, the situation does not present greater difficulties than many that arise in the case of industrial patents.
>
> "In specifying the differences in characteristics the Patent Office will undoubtedly follow the practice among botanists in making use of verbal descriptions and photographic and other reproductions, taking some known plants as a basis of comparison. Modern methods of identification, together with such amplification thereof as may reasonably be expected, will render it possible and practicable to describe clearly and precisely the characteristics of a particular variety. When this can not be done by an applicant for a patent, the variety is not clearly distinguishable as a distinct variety, and no patent would issue."

16 i.e. as defined in Section 102.

17 Section 103 reads as follows:

> "Section 103. Conditions for patentability; non-obvious subject matter

[Cont'd]

Plant Corp.,[18] the practical operation of the system results rather in a requirement of 'meaningful' distinctness as provided by Article 6(1)(a) of the 1961 and 1978 Acts of the UPOV Convention on the basis of the notion of "important characteristics."[19]

(viii) It alleviated the requirement that the patent disclosure contain sufficient information and direction to allow a person of ordinary skill and knowledge to put the invention into practice and work it. It thereby overcame the problem of reproducibility of the breeding process, which is still of current interest.[20]

(ix) It provided for a limitation to a single claim for the "plant" (or variety) and thus excluded vertical extensions (e.g. to the fruit or flower) and horizontal extensions (to similar varieties).

(x) It defined a limited effect of the right, which related to the asexual reproduction of the "plant" and the sale and use thereof. Royalty collection is to take place at the reproduction level according to the Yoder decision. A major element of uncertainty derives from the phrase "reproducing the plant." It is suggested in Yoder that infringement of a plant patent presupposes the use of material from the patentee or derived therefrom.[21] The Pan-American

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[Footnote 17, cont'd]

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18 193 USPQ 264 (5th CA-1976):

> "... If the plant is a source of food, the ultimate question might be its nutritive content or its prolificacy. A medicinal plant might be judged by its increased or changed therapeutic value. Similarly, an ornamental plant would be judged by its increased beauty and desirability in relation to the other plants of its type, its usefulness in the industry, and how much of an improvement it represents over prior ornamental plants, taking all of its characteristics together."

19 S.D. Schlosser, in: Records of the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants, 1978 (Records of 1978), UPOV, 1981, at p. 183.

20 For instance in Canada as shown by the Supreme Court decision of June 22, 1989, in Pioneer Hi-Bred v. Commissioner of Patents.

21 "Plant Variety Protection statute, 7 U.S.C. 2321-2583, applies only to sexually reproducing plants; asexual reproduction is only way that breeder can be sure he reproduced plant identical in every

[Cont'd]

Plant Co. v. Matsui decision[22] affirmed the contrary one year later in a footnote recalling the fate of the move by the defendant for a summary judgment.[23]

The American lawyers were conscious of the fact that the Plant Patent Act was experimental[24] or embryonic.[25] Experience shows, however, that once the basic questions left open by the conciseness of the Act had been settled during the formative period, it did very well indeed as demonstrated by the success of one of the branches of industry which has extensively used the plant patent system, the American fruit tree breeders. But it could not serve as a model to be readily copied by other countries (only Cuba in 1937, South Africa in 1952 and the Republic of Korea in 1973 introduced plant patents, probably in an effort to align their overall patent system to the American one). Rossman (op. cit.) regretted in 1935 that "the provisions for plant patents were hastily injected into the basic patent laws without fully providing for all contingencies which may arise"; he expressed the view that "it would be much more satisfactory to have a separate plant law as in the case of design patents."

European Attempts to Introduce an Integrated Variety and Seeds System

Although the aversion to patents in the field of food--based on the fear that "protection might increase the price of food [...] necessary for the greater masses of the population, and that all might suffer from the privilege

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[Footnote 21, cont'd]

respect to parent so that it is possible that plant patent infringement would occur only if stock obtained from parent plant is used, given unlikelihood that any other plant could actually infringe; accused infringer that proved it developed accused plant independently would not be liable in damages or subject to injunction for infringement, but whether it would be entitled to patent is problematic; asexual reproduction is heart of plant patent system; key to 'invention' of new plant is discovery of new traits plus foresight and appreciation to take step of asexual reproduction."

22 198 USPQ 462 (D.C. N. Calif. 1977)

23 "... Defendant contended that the Plant Patent Act prohibits only the sale of plants grown from plant material cloned directly from the patented plant. The Court concluded that defendant's interpretation of the Plant Patent Act is incorrect, and that the Act bars the asexual reproduction and sale of any plant which is the same variety (i.e., has the same essential characteristics) as the patented plant, whether or not the infringing plant was originally cloned from the patented plant. Since plaintiff's claim of infringement will be denied on other grounds, however, there is no need to discuss the asexual reproduction question in detail."

24 Anonymous, Plant Patents Criticisms and Suggestions, JPOS, 1934, pp. 184-185; Anonymous, Plant Patent Symposium, JPOS, 1934, pp. 252-255.

25 D.H. Sweet, Disclosure in Plant Patents, JPOS, 1934, pp. 661-663.

granted to a single person"[26]--was as strong in Europe as in the United States of America, the efforts to secure a source of revenue for breeders were particularly directed in the initial phase at agricultural crops in the Old World. They were deployed in two directions: organization and moralization of the seed trade, and patenting.

In the 1920's and 30's various States introduced (or tried to introduce) the embryos of the current seed certification and national lists of varieties (catalogs) systems,[27] in some cases on the basis of the arrangements that had already been made on a private or semi-official basis.[28] Through the exclusive use of control signs and of denominations, the breeder was to be given an improved position, at least on the high-quality seed market. In some instances, however, that position was soon to be eroded again.[29]

Czechoslovakia.- Czechoslovakia was to take the lead with its Law on the Recognition of the Originality of Types, Seeds and Seedlings, and the Testing of Horticultural Types[30]. It provided in particular that the entry into one of the registers or lists held for the plant material of the various kinds entitled the registered horticulturalists and producers to put their

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26 Anonymous, Convient-t-il d'accorder des brevets pour les produits chimiques, alimentaires et pharmaceutiques, PI, 1885, 49-51 (this article attempted to explain that the fears were not justified). In the Federal Republic of Germany, for instance, the exclusion of inventions relating to foodstuffs, alcoholic beverages and tobacco (Genussmittel), medicaments, and substances produced by chemical processes, which was quite commonplace in the first part of this century, was removed in 1967 only.

27 e.g. France (Decree of December 5, 1922, concerning the Introduction of a Register for Newly-bred Plants and the Setting-up of a Seed Control Committee, see PI, 1923, pp. 28-29) and the Netherlands (setting-up of the Netherlands General Department for the Control of Agricultural Seed and Potato Seedlings (NAK) in 1932).

28 For instance, the first seed testing station seems to have been established in 1869 at Tharandt in Germany by Professor F. Nobbe, who published his Handbuch der Samenkunde in 1876. The first Austrian seed testing station was founded in 1881 by the Agriculture Society, and the first Swiss in 1871 (see R. Meinx, 100 Jahre Bundesanstalt für Pflanzenbau und Samenprüfung in Wien - 1881 bis 1981, Festschrift, Eigenverlag, 1981). The first Danish seed testing station was set up in 1871 in Copenhagen under the management of Möller-Holst, and the first Swedish in 1876 following an initiative of the Royal Academy of Agriculture (see H. Esbo, Swedish Seed Testing 100 Years, Berlingska Bocktryckeriet, Lund, 1975, 140p.).

29 So in Germany, where, in 1920, the Oberstes Landgericht (Kammergericht) of Prussia decided that third parties could use a trademark relating to a variety in conjunction with 'Nachbau' when putting on sale a generation of seed following those of "elite" (produced under the supervision of the breeder) or "original." The Chamber of Agriculture of the province of Brandenburg played a leading role in this highly controversial decision.

30 No. 128 of March 17, 1921. See PI, 1922, pp. 70-71 (the translation, itself based on a translation from German, may not be reliable).

material into commerce, but only under the registered indications (but other seed or plant owners could obtain the same authorization from the Qualification Committee). In addition, individuals and establishments who produced original material were the only ones allowed to make use of a registered trademark.

Germany.- Of particular interest in the context of the background to the UPOV Convention is the draft Seeds and Seedlings Law submitted to the German Parliament in 1930, i.e. in the same year as the United States Plant Patent Act was adopted[31]: it contained a chapter on the "Protection of the Breeder." Such protection was to be available for new varieties, that were distinguishable from existing varieties by important characteristics that were inheritable or transferable by vegetative propagation and also capable of being shown experimentally. This language announces Article 6(1)(a) of the 1961 and 1978 Acts of the UPOV Convention. Varieties obtained by a mere selection within an existing variety had, in addition, to reflect important or substantial (erheblich) progress, which could also be accepted if its expression was limited geographically. The anticipation of the issue of 'dependence' or 'essentially derived varieties' currently dealt with in the framework of the revision of the Convention is remarkable.

The proposed effect of protection related as in Czechoslovakia to the use of additions to the variety denomination; however, the exemptions for trade not using the written form or in respect of later generations, or again for trade without use of the denomination or with the use of a different one would have offered vast opportunities for competitors to tap in on the breeder's achievement. A further exemption was made in favor of direct exchanges between seed producers and users, relating to quantities to be specified, where the firm's own facilities were used for transport. A somewhat analogous exception has been written 40 years later into the Plant Variety Protection Act of the United States of America.[32] Finally, the draft authorized registration of a variety denomination as a trademark, but prohibited the assertion of the trademark in certain circumstances, a principle which will be found in the original (1961) text of the UPOV Convention.

The draft never became law, however, and the Law of June 27, 1953, on the Protection of Varieties and the Seeds of Cultivated Plants (Seed Law)[33] had to be awaited to see the efforts to do justice to the breeder recompensed. That Law played a substantial part in the making of the UPOV Convention.

Under Article 1, the purpose of protection was to promote the creation of useful (wertvoll) new varieties of cultivated plants. Consequently protection was reserved for varieties produced by breeding or improvement (Züchtung), which were of agronomic value. An exception was provided, however, for non-food plants and for varieties intended for export. In addition, the variety had to be "individualized" and stable. The individualization criterion corresponds more or less to the present concept of distinctness written into Article 6(1)(a) of the 1961 and 1978 Acts of the UPOV Convention, and also to the distinctness concept in the 1930 draft.

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31 See GRUR, 1930, pp. 244-251.

32 Public law 91-577 of December 24, 1970, Section 113. See Plant Variety Protection (PVP) No. 37 (December 1983).

33 Bundesgesetzblatt, 1953, Part I, pp. 450-462.

Protection conferred on its owner the exclusive right to produce seed of the protected variety for the purposes of the seed trade, to offer them for sale and to market them. So protection was now immediate, and no longer contingent on use of the denomination. Export of one of the first generations of multiplication (Hochzuchtsaatgut) was subject to specific authorization by the breeder.[34] Conversely--and this is a throwback to the past--the production and marketing of certified derived seed could be carried out without restriction, but against payment of remuneration to the breeder, when certification was provided for (Article 13). Finally the principle of the freedom of use of the seed of a protected variety for the creation of a new variety was expressly stated; this anticipates Article 5(3) of the 1961 and 1978 Acts of the UPOV Convention.

Anyone who marketed seed of the protected variety had to use the variety denomination, as provided subsequently in Article 13(7) of the 1961 and 1978 Acts of the UPOV Convention. If the denomination was the subject of a trademark registered in favor of the owner of protection, the latter could not prohibit the use of the denomination where such use was compulsory or alternatively permitted, in the case of certified derived seed. This provision was severely criticized by the lawyers as being contrary to the fundamental principles of trademark law. Yet that did not prevent it from giving rise, in Article 13(3) of the 1961 Act, to provisions that were similar in principle.

Netherlands.- Yet the Seed Law was not the first to provide for breeders' rights in Europe: it was preceded by the 1941 Breeders Ordinance of the Netherlands, published on July 5, 1942.[35]

This text was also concerned both with breeders' rights and with the regulation of the seed trade. From the latter point of view it introduced, for certain species, a system for the cataloging of varieties passed for marketing. The seed of those varieties could only be marketed under a registered denomination; in addition, they had to be tested. When seed of an inferior category was tested, a fee was charged for the benefit of a fund to remunerate breeders.

In the case of species that were not subject to cataloging, the breeder was granted the exclusive right for 25 years to market the seed of his variety (mandatory use of the registered denomination was also provided for varieties of such species). In the case of the other species, the right related only to the first generation of seed ("original" or "elite" seed) and to the grant of a royalty drawn from the remuneration fund.

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34 This provision is still a feature of the Plant Variety Protection Law of the Germany (Article 10, item 4, of the Law of December 11, 1985; see PVP, No. 51 (September 1986)). It is also contained in the Hungarian Law on the Protection of Inventions by Patents (Article 68(2); see PVP, No. 49 (January 1986)). A similar provision was inserted in the 1991 Act of the UPOV Convention (Article 16(1)(ii)) in the form of an exception to the exhaustion of the breeder's right.

35 See PI, 1944, pp. 44-48.

The Exploration of the Patent Avenue

Germany.- The Dutch Ordinance was the first to introduce a breeder's right similar to the minimum right provided for in Article 5(1) of the original text of the UPOV Convention, albeit in respect of ornamental plants only. Those plants were excluded from the scope of the German Seed Law. Their protection could therefore only be obtained through patents. In this respect, on account of the evolution of the situation since the 1930's and with a view not to upset the patent circles, the Seed Law contained a provision to ensure a smooth operation of both systems in the case of 'double protection': the rights deriving from the patent could only be exercised to the extent that they were not at variance with the provisions of the Seed Law.

The efforts to have the patentability of plant varieties accepted started in the early 1930's in Germany.[36] The figureheads in this movement were Franz and Freda Wuesthoff, who also played a major role in AIPPI. The first positive decisions of the Beschwerdesenat (appeal body) were issued in 1934 in relation to "tobacco seed" and "lupin seed" and in 1936 in relation to "seed of a small-seeded garden pea." But owing to opposition and pressure from the Reichsnährstand based on considerations of agricultural policy, the applications were subsequently withdrawn. What was then left was a lively debate in doctrine over the patentability of plant varieties. Strong views were voiced against the patentability on the basis of patent law considerations; the lupin seed application, which had been extensively commented on by the Wuesthoff's, in fact showed that obstacles were to be overcome through clever formulation of the claims.

Patents were then granted after the war, mainly for ornamental plants, but the continuing controversy over the patentability of varieties and the need to resort to carefully drafted claims of dubious validity did not make the patent an efficient form of protection. The advent of the UPOV Convention, the celebrated "red dove" decision handed down in 1969 by the Supreme Court,[37] and the magistral analysis thereof by H.G. Hesse[38] then closed the debate until the advent of 'biotechnology.'

Other West-European Countries.- The relation between patents and varieties was quite as hectic in France following a decision handed down by the Nice Commercial Tribunal on March 23, 1921, in re Valuy v. Brun which stated that "the creator of a flower has no proprietary right in his creation, as no law recognizes the existence of such a right."[39] Several attempts made

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36 Detailed accounts can be found in recent contributions published by the Max-Planck Institute, in particular R. Moufang, Genetische Erfindungen im gewerblichen Rechtsschutz, 1988, 401 p., and H. Neumeier, Sortenschutz und/oder Patentschutz für Pflanzenzüchtungen, 1990, 247p.

37 GRUR, 1969, pp. 672-676 (with a note by Heydt).

38 Zur Patentierbarkeit von Züchtungen, GRUR, 1969, pp. 644-653.

39 The decision related to the alleged theft of some 1000 cuttings of a carnation variety during the First World War, whilst its breeder was serving in the army (see M.-A. Hermitte, Histoires juridiques extravagantes - La reproduction végétale, in: B. Edelman et M.-A. Hermitte, L'homme, la nature et le droit, Christian Bourgeois éd., 1988, p. 42).

between June 1921 and 1930, in particular by Deputy Humbert Ricolfi, to 'create or regularize horticultural patents' or introduce 'agricultural and horticultural property' failed, not least because patent specialists had claimed that the matter was covered by the patent law.

The first patent was then issued in 1949, after the celebrated rose breeder Francis Meilland secured the assistance of the Ministry of Agriculture and the Industrial Property Office for the drafting of a patent for the rose 'Rouge Meilland-Happiness.'[40] That patent was then to serve as a model for applications in Belgium, where the patentability of varieties was subsequently affirmed by the First Instance Court of Termonde by a decision of May 2, 1958.[41]

In Italy, the decision of the Appeal Board of the Central Patent Office of April 9, 1948 (which concerned a process for the "formation of plants having several root systems"), recognized patentability in the plant world.[42] Francis Meilland then obtained his first patent on November 5, 1951. As in France and Belgium, many patents have been granted, almost exclusively for ornamental plants, mainly roses and carnations. But the breeder's position remained most insecure owing to differing case law.[43] By that time, the usages and practices of the trade had offered an alternative in relation to the cut flower production: the system of contracts based on the lease or rent of plants, which had developed first in the Province of Imperia, was acknowledged in 1949 by the Chamber of Commerce, Industry and Agriculture of the Province in its Official Compilation of Usages and Practices and affirmed by case law.[44]

Francis Meilland was unsuccessful, however, in Switzerland, where a ruling of the Federal Tribunal was handed down on January 27, 1953.[45] In

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40 B. Laclavière, The French Law on the Protection of New Plant Varieties, IP, 1971, pp. 44-47.

41 See GRUR, 1959, pp. 395-397.

42 L. Lodi, La tutela delle novità vegetali nell'ordinamento giuridico italiano e nelle legislazioni estere, Edagricole, 1976, 195p.

43 A series of tribunals affirmed the validity of the granted patents in infringement proceedings; another affirmed patentability but declared the patent at issue null and void on account of insufficient description (this decision hit in particular the famous rose 'Baccara'); a third found the patent laws to be inapplicable to living matter (see L. Lodi, op. cit.).

44 On this interesting development, see L. Lodi, Usage, Practices and Contracts for the Distribution of New Plant Varieties, UPOV Newsletter No. 10 (September 1977), pp. 5-12.

45 The Tribunal considered that the invention was not in the variety itself, because the creative activity would not be deployed in the course of its propagation, which would occur through known methods. It lay in its creation, which, however, was not repeatable, a fact which resulted in a lack of industrial applicability.

countries such as Denmark, the Netherlands and the United Kingdom, patents were not available.[46]

In Spain, some rose varieties were granted utility model protection.[47]

In Austria, the Federal Law of December 12, 1946, on the Protection of Austrian Plant Breeding (Law on Plant Breeding)[48] offered some protection to breeders on the basis of the well known obligations imposed on the seed trade since Czechoslovakia paved the way for them in 1921. But Austria also offers us an example of successful recourse to competition law: the Supreme Court indeed held on October 9, 1957, that it was unlawful to propagate a new variety without the consent of the breeder and market it under another denomination.[49]

Hungary.- The evolution of the situation in the East-European countries had no impact on the advent of the UPOV Convention. Nevertheless, the description of the background to the UPOV Convention would not be complete if no mention were made of the evolution in Hungary.

A curious second-hand report appeared in Le Droit d'auteur in 1941.[50] It was then reported that according to an article published in Pester Lloyd, "breeders have been assured by the official circles that the provisions of copyright law would soon be extended to their products..." The editor wondered whether the term 'Urheberrecht' appearing in the communication he received was correct; but if it was, then Hungary would have been the first to point to the similarities in the exploitation of e.g. printed works and varieties. It may also be that the report referred to the system of plant qualification which was introduced in the same year.

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46 Although a patent containing a product claim had been granted for a process for the production of fast-growing trees in the United Kingdom. On February 24, 1954, the Patents Appeal Tribunal rejected an application by N.V. Philips Gloeilampenfabrieken for a process for the cultivation of a poinsettia on the ground that it was not a "manner of manufacture" to modify the conditions under which natural phenomena take their inevitable course. The same application was rejected in the Netherlands on account of a narrow interpretation of the term 'industry' (decision of the Appeal Board of the Patent Office of February 6, 1958). It was upheld on appeal in the Federal Republic of Germany. See H. Schippel, Zur Patentierung landwirtschaftlicher Kulturverfahren, GRUR Int., 1958, pp. 333-337 and the decisions, ibid., pp. 337-339.

47 See Actes des Conférences internationales pour la protection des obtentions végétales, 1957-1961; 1972 (Actes de 1957-1961; 1972), UPOV, 1974, at p. 24, and J.G. Reixach, La protection juridique des nouveautés végétales en Espagne, PI, 1955, pp. 119-120.

48 Bundesgesetzblatt, February 26, 1947, pp. 309-313. For an analysis in a historical perspective, see R. Hron, Sortenzulassung und Sortenschutz in Oesterreich, in Festschrift - 100 Jahre Bundesanstalt für Pflanzenbau und Samenprüfung in Wien - 1881-1981, op. cit.

49 "Concerto" decision. See GRUR, 1959, p. 397.

50 Anonymous, Sur la protection des nouveautés végétales, pp. 119-120.

Patents were then granted under the old patent law, on account of the definition appearing in Article 1(3) of the Paris Convention of 1883[51] and the absence of a definition in the law. Pálos[52] noted that the same difficulties arose in Hungary as in other countries from the exclusion of products used as human or animal food, from the provision whereby biological processes were refused protection, and from the definition of the right--which was to manufacture and sell the invention. And he concluded that the protection afforded was not adequate.

This was in fact the conclusion of the Government, since it led to the currently applicable patent law[53] which contains a special part on the protection of plant varieties and--this is an innovation--animal breeds along the lines of the UPOV Convention. That law formed the basis for Hungary's accession to UPOV in 1983.[54]

The Contribution by the International Non-governmental Organizations

A decisive role in the elaboration of the UPOV Convention is to be recognized to the International Association for the Protection of Industrial Property (AIPPI) and to the International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL). They were about the only NGO's, with the International Chamber of Commerce, which promoted the idea of protection for plant varieties and paved the way for an international conference on the subject.

The AIPPI has been concerned with the issue since 1932, under the enthusiastic leadership of the Wuesthoff's. But the issue could only be placed, as a major question, on the agenda of the Vienna Congress in 1952. Various texts were adopted at that congress and at further events, a token of the impossibility for industrial property lawyers to achieve a common position.[55] It remains however that, in the Notes of invitation to the 1957 Paris Conference which was to lead to the UPOV Convention, the AIPPI was the first organization whose activities were referred to. In particular, it was noted that "at the

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51 "Industrial property shall be understood in the broadest sense and shall apply not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured or natural products, for example, wines, grain, tobacco leaf, fruit, cattle, minerals, mineral waters, beer, flowers, and flour."

The interpretation according to which all branches of industrial property should apply to all quoted activities and products seems, however, farfetched.

52 The New Hungarian Law on Inventions, PI, 1969, pp. 254-259.

53 Law on the Protection of Inventions by Patents (No. II of 1969, as amended by Decree-Law No. 5 of 1983) (see PVP No. 49 (January 1986)).

54 The instrument of accession was deposited on March 16, 1983.

55 For the evolution, see A. Heitz, The History of Plant Variety Protection, in: The First Twenty-five Years of the International Convention of the Protection of New Varieties of Plants, UPOV, 1987, pp. 53-96.

close of its Congresses of Vienna (1952) and Brussels (1954), it expressed wishes to the effect that protection for new plant varieties be provided on the basis of the patent for invention or of any other means."[56]

ASSINSEL was founded in 1938 and was soon to pass a resolution asking for the international recognition of the filing of trademarks and appellations as a means of protection (pending introduction of a patent), for the adoption of the principle of a license to be drawn up by ASSINSEL for the purposes of multiplication and sale, and for the acceptance of the notion of 'original seed' being seed produced, offered or sold by the breeder of the variety or under his control by his licensees or successors in title.[57]

After the war, and after it had realized that the patent route was in fact a blind alley, it passed in June 1956 in Semmering (Austria) an emphatic resolution calling for the organization of an international conference to consider the question of protecting plant varieties officially, and if possible to lay down principles to govern that protection. France was approached for the organization of such a conference. This resolution then served as the basis for the invitations to the 1957 Paris Conference. The Notes mention their strong wish that "an international Convention sanction the established practices and facilitate the international trade with new plant varieties."[58]

The Discussions on Patents at International Level

If the ASSINSEL resolution--which had been carefully prepared with the French authorities[59]--opened the way for an international conference, its success was dependent upon the removal of the patent cloud; the controversy over the patentability of plant varieties, which in effect paralyzed both the partisans and opponents of patentability, had to be set aside. This task fell on the patent experts under the auspices of the Council of Europe and the Paris Union for the Protection of Industrial Property, which was administered by the United International Bureaux for the Protection of Industrial, Literary and Artistic Property (BIRPI), the predecessors of the World Intellectual Property Organization (WIPO).

An unprecedented move towards harmonization and integration in the field of patents was initiated by the Council of Europe, almost immediately after its inception, on May 5, 1949. It was to produce the Convention on the Unification of Certain Points of Substantive Law on Patents for Inventions, signed in Strasbourg on November 27, 1963,[60] and the Convention on the Grant of European Patents (European Patent Convention), signed in Munich on October 5, 1973.[61] The former provided in its Article 2 that "the Contracting States

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56 Actes de 1957-1961; 1972, p. 13.

57 Congress of July 8 and 9, 1939, held in Paris.

58 Actes de 1957-1961; 1972, p. 14.

59 B. Laclavière refers to this fact in a number of his publications.

60 See IP, 1964, pp. 13-15.

61 See IP, 1974, pp. 51-89.

shall not be bound to provide for the grant of patents in respect of [...] plant or animal varieties or essentially biological processes for the production of plants or animals; this provision does not apply to micro-biological processes and the products thereof." The latter provided in its Article 53 for an exclusion of that subject matter from patentability under it. This principle seems to have been agreed upon at a rather early stage, and in any event before the adoption of the UPOV Convention.[62] Some of the experts who worked on these important texts also participated in the drafting of the UPOV Convention, and therefore ensured a welcome coordination.

The Paris Convention for the Protection of Industrial Property of March 23, 1883, was to be revised in a Diplomatic Conference held in Lisbon from October 6 to 31, 1958. In 1955, a meeting of experts responsible for preparing that Conference agreed not to include the question of new plant varieties in the Conference agenda because, in the experts' opinion, it was not yet ready for inclusion.[63] The representatives of member States also resisted in the course of the Diplomatic Conference the attempts by AIPPI and the ICC to have that question, or the question of the creation of a catalog of agricultural and horticultural novelties, examined.[64] As a result of a misunderstanding, a proposal attributed to the observer of FAO led to the entry of the question of plant novelties on the agenda of Committee I and its withdrawal on the next day since "no delegation of a Unionist country took up such request."[65] The

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62 The explanations given by K. Pfanner, Vereinheitlichung des materiellen Patentrechts im Rahmen des Europarates, GRUR Int., 1962, pp. 545-554, are now increasingly taken to mean that plant varieties are excluded from patent protection only to the extent that they are covered by the plant variety protection system. The report given by G. Finniss, Rapporteur-General, to the Committee of Experts on Patents on November 28, 1960, (unpublished) indicates, however, that the concurrent work on a plant variety protection system was only incidental:

> "A constructive effort to harmonize the European systems should aim at reconciling current conceptions in the limited sector just described, which is where the divergences are found.
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> [...]
>
> "It would be highly inexpedient to try to impose a common solution for the highly controversial question of the patentability of new plant varieties.
>
> [...]
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> "It is known, moreover, that the legal protection of plant varieties is at present under study in another context, following the French Government's initiative in calling a conference in 1957, attended by the majority of European countries, with the object of drafting a Convention on the subject."

63 See Die Lissaboner Konferenz zur Revision der Pariser Verbandsübereinkunft, GRUR Int., 1959, p. 59.

64 The requests are published in Actes de la Conférence réunie à Lisbonne du 6 au 31 octobre 1958, BIRPI, 1963, pp. 973-974.

65 See Actes de la Conférence réunie à Lisbonne du 6 au 31 octobre 1958, op. cit., p. 305, and Die Lissaboner Konferenz zur Revision der Pariser Verbandsübereinkunft, op. cit., p. 80.

International Bureau of BIRPI itself tried, also in vain, to keep the emerging UPOV Convention within the framework of the Paris Convention, by giving it the form of a special agreement. Equally in vain was its attempt to make the representatives of member States--mainly patent office directors--aware of the risk of drift, and then of the actual drift towards a specialized Convention and Union. Thus those responsible for industrial property in the Paris Union as a whole, through their resistance, left the coast clear for the Paris Conference and the UPOV Convention.

The Emergence of a New Convention and a New Organization

The proceedings of the two conferences which were held in Paris from May 7 to 11, 1957, and from November 21 to December 2, 1961, and of the various committees[66] will not be described here, since the sources are limited in number[67] and since an account has already been given elsewhere.[68]

To maximize the chances of success,[69] the French Government issued invitations to twelve countries only, all from Western Europe, which were known to share the same concerns and the same hopes (Austria, Belgium, Denmark, Finland, Federal Republic of Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom). All were to participate at one stage or another in the elaboration of the UPOV Convention.[70]

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66 In chronological order:

Paris, April 22-25, 1958	Committee of Experts, first meeting
Paris, September 16-19, 1958	Committee of Experts, second meeting
Paris, January 8-9, 1959	Drafting Committee
Paris, April 2-3, 1959	Drafting Committee
Munich, June 30-July 3, 1959	Committee of Experts, third meeting
Paris, November 4, 1959	Group of Legal Experts on the Relation Between Protection of the Names of New Plant Varieties and Trademark Protection
Paris, January 18-19, 1960	Group of Legal Experts on the Relation Between the Paris Convention for the Protection of Industrial Property and the Preliminary Draft of the Convention for the Protection of New Varieties of Plants
Paris, January 20-23, 1960	Drafting Committee
Rome, February 15-20, 1960	Committee of Experts, fourth meeting
Paris, April 20-22, 1960	Drafting Committee

67 Actes de 1957-1961; 1972, op. cit., and H. Schade & K. Pfanner, Das internationale Uebereinkommen zum Schutz von Pflanzenzüchtungen, GRUR Int., 1962, 341-364.

68 A. Heitz, op. cit.

69 B. Laclavière, personnal communication.

70 Finland and the United Kingdom were not represented at the first conference. The United Kingdom participated actively in the subsequent work. Finland participated in the second conference, whereas Norway did not.

The Rationale of Plant Variety Protection in the Perspective of the 1957 - 1961 Diplomatic Conference.- The Notes of invitation to the 1957 Conference had been carefully drafted and hinted to the desirability of a (special) system of protection. Particular emphasis was placed on the promotion of the seed trade. We have already noted the wish of ASSINSEL in this connection. The Notes also mentioned the fact that the European Conference on the Development of Seed Production and Trade held in Stockholm in July 1954 had made some conclusions in respect of plant variety protection. After referring to the special needs of agriculture, they concluded that "it appears therefore desirable to reach an agreement among the various countries which are favorable to the promotion of the seed trade on the principles which should govern the protection of new plant varieties and, if possible, on the appropriate institutions to ensure such protection." They also suggested that the conference "might have the main purpose to study the technical aspect of the problem, taking into account in particular the requirements of the seed trade," whereafter the participating States could discuss the usefulness of a new Convention containing the common principles that could have been agreed upon, either in the form of a special agreement under the Paris Convention of 1883 or "in the form of a Convention establishing a distinct international Union which would be open to any State wishing to adhere to it."

At the opening of the first conference, the Under-Secretary of State for Agriculture Kleber Loustau further referred to the principle of equity as between breeders, inventors and authors--a principle that had already been used emphatically at the beginning of the century in the United States of America[71]--and, more generally, to Article 27(2) of the Universal Declaration of Human Rights.[72]

Kleber Loustau could not ignore the objection that "it would be contrary to the interest of mankind to allow monopolies over agricultural products which are indispensable foodstuffs." He replied that it was "a pressing need to promote research in all its forms, public or private, individual or collective," and that "according to an expression in use in a neighboring country, research is 'tomorrow's bread'."

He further stated that "it is beyond doubt that in the absence of any governmental control one could indeed fear monopolistic or malthusian attempts which could slow down the spreading of valuable new varieties" and suggested that breeders' rights would be a form of control. And he concluded with the needs of international trade and the growing internationalization of economic activity.

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71 Luther Burbank, a famous plant breeder, has expressed this principle in the following terms before the House of Representatives:

> "A man can patent a mousetrap or copyright a nasty song, but if he gives to the world a new fruit that will add millions to the value of the earth's annual harvests, he will be fortunate if he is rewarded by so much as having his name connected with the result."

72 "Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author."

All these considerations were to find their way into the Preamble to the original text of the Convention[73] and to be reaffirmed at the revision of 1978. They can also be found, for instance, in the full title of the Plant Variety Protection Act which was enacted on December 24, 1970, by the United States of America to complement its Plant Patent Law in respect of sexually reproduced varieties[74], and in the explanatory memorandum to the Seeds and Phytogenetic Creations Law of Argentina.[75]

How, and how much, the UPOV Convention has served the purpose in practice will be described in the next part.

The Basic Principles of the 1961 UPOV Convention.- In the final analysis, the basic principles of the protection system were already set out in the Final Act adopted on May 11, 1957.

With regard to the technical conditions to which the grant of a title of protection was to be subject, the conference agreed that the variety had to be distinct from pre-existing varieties, sufficiently homogeneous and stable in its essential characteristics, and that the artificial or natural origin of the initial variation that gave rise to it was of no consequence. The condition of distinctness was to be amplified subsequently to read "clearly distinguishable by one or more important characteristics." The adjective, "important" was adopted "in spite of its imprecision, because it does not seem possible to protect a variety that has only minimal differences."[76]

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73 "The Contracting States,

"Convinced of the importance attaching to the protection of new varieties of plants not only for the development of agriculture in their territory but also for safeguarding the interests of breeders,

"Conscious of the special problems arising from the recognition and protection of the rights of breeders and particularly of the limitations that the requirements of the public interest may impose on the free exercise of such a right,

"Deeming it highly desirable that these problems, to which very many States rightly attach importance, should be resolved by each of them in accordance with uniform and clearly defined principles,

"Anxious to reach an agreement on these principles to which other States having the same interests may be able to adhere."

74 "An Act to encourage the development of novel varieties of sexually reproduced plants and to make them available to the public, providing protection available to those who breed, develop, or discover them, and thereby promoting progress in agriculture in the public interest."

75 Law No. 20.247 of March 30, 1973. The developments on the rationale of the plant variety protection system concern Chapter V of the Law.

76 The reference to "one or more important characteristics" has been deleted in the course of the 1991 Diplomatic Conference for the Revision of the UPOV Convention, without thereby implying a substantive change.

The origin of the variety to be protected was also carefully examined. After having agreed that the mere selection of a genotype from among those included within a pre-existing variety would not be a creative act affording a right to protection and that there should be a requirement of effective work on the part of the breeder, the experts finally adopted the solution that had been written into the United States Plant Patent Act 30 years earlier.[77]

With regard to the fundamental right of the breeder, it decided that it was to relate to the trading of seed and seedlings of the variety and reserved the question of extension to the marketed product (foliage, flowers or fruit) in the case of ornamentals. No agreement could be reached subsequently on the latter point, so that the second conference decided to provide for a minimum scope of protection with a possibility for extensions.[78]

The first conference also stated the principle of the free use of the variety as parent material in breeding work ("breeder's exemption").[79]

It acknowledged the principle of the independence of protection in relation to the systems governing seed and seedlings and stated the principle according to which a variety not entered in the catalog of varieties passed for marketing could also be protected (in other words, in practice, the fact of not having sufficient value for cultivation and use for entry in the catalog was no bar to protection). The usefulness criterion was to be reconsidered subsequently, and discarded again.

Finally, at the first meeting of the Committee of Experts, it was agreed that the breeder should be placed under the obligation to ensure maintenance breeding of the variety during the period of protection. That obligation--which is also one justification for the plant variety protection system--was subsequently written into the Convention in the form of a ground for forfeiture in the event of failure to comply.

The Impact of the Patent Controversy.- Whereas the first conference was able to reach agreement on the 'technical aspect of the problem'--and meet the expectations of the organizers--the experts were soon to be confronted with the spinoffs of the patent controversy. Naturally, the representative of BIRPI took great pains to ensure that the emerging Convention would find its place under the Paris Convention of 1883 and, when that became unlikely, that it

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77 The 1991 Diplomatic Conference adopted a definition of 'breeder' applying, in particular, a "person who bred, or discovered and developed, a variety" (Article 1(iv) of the 1991 Act). This definition entails no change in relation to the present practice of member States, which recognizes the importance of e.g. the discovery of mutants for varietal progress.

78 No change was made to that provision during the 1978 revision. The Diplomatic Conference, however, adopted a recommendation to the effect that member States should take adequate measures, i.e. grant more extensive rights, where this was desirable to safeguard the legitimate interests of the breeders (see Records of 1978, p. 274). In 1991, the relevant provisions were completely reformulated (Articles 14 to 16 of the 1991 Act).

79 The amendments incorporated in the 1991 Act (Article 14(5)) concern the exploitation--and not the breeding--of certain kinds of varieties.

would not contain conflicting provisions. This must also have been the objective of other delegates throughout the preparatory work.

This led in particular to the inclusion of a provision on priority, although the experts noted that the question of the right of priority did not arise in the same way for new varieties of plants as it did for industrial inventions. They therefore adopted the principles governing that right in the Paris Convention, but adapted them: the breeder who claimed the right of priority within the Convention time limit of twelve months was to be granted an additional period of four years within which to provide the additional documents and the plant material for testing. This was justified by the fact that a breeder making multiple applications might not have enough plant material to supply all national offices for testing purposes.

In addition, whereas in the patent system an inventor is usually obliged to make his further applications within the priority period because of the 'suicidal effect' of the publication of the first application, the breeder was to be granted a period of five years within which to file applications in other countries (without claiming priority); in that case no disclosure or exploitation that occurred during the intervening period could be held against him if it concerned his own variety.

Later on, the experts realized the need to distinguish between 'distinctness'--a technical requirement--and 'novelty'--a legal requirement for protection. To protect a conscientious breeder who would test the commercial potential of his variety before filing an application for protection, they proposed that such tests, or an application for entry in a catalog, or an entry in such a catalog would not be held against the breeder if his own variety had not been the subject of an act of effective marketing on the territory of the State concerned. At the second conference, the proposed provisions were reorganized: the requirement that there should be no act of marketing was extended to all applications (i.e. to the initial application and to the subsequent ones, with the effect that there is no time limit for filing subsequent applications other than that which results from the acts of marketing carried out by the breeder or with his authorization), but restricted to the country of application; the five-year 'period of grace' was reduced to four and made applicable to all applications, but restricted to countries other than the country of application (Article 6(1)(b) of the 1961 Act).

Contrary to what happens under patent law, novelty is not affected by the publication of the variety (in the form of the publication of its description or the exhibition of plants of the variety). This is due to the fact that a description is not sufficient to make the variety available to the public. In the same way, the mere publication of its breeding history does not enable a person skilled in the art to 'recreate' the variety; this is one of the reasons for which the breeding history is usually not published in connection with the grant of plant breeders' rights. Another reason is the fact that the breeding history is frequently not known, in particular when recurrent selection is applied, or of no practical value, in particular when the genitors are not maintained.

The absence of publication of the breeding history does in no way disrupt the balance of the 'deal' between the State and the individual who is granted a temporary monopoly right (for a minimum of 15 or 18 years, as the case may be, under the 1961 and 1978 Acts and 20 or 25 years under the 1991 Act): the individual meets his part of the deal by marketing the variety.

The refinement of the novelty condition had a consequence on the distinctness rule, which was to be related, not to any variety being a matter of common knowledge, but to any other such variety. The term 'other' is somewhat troublesome insofar as the concept of variety does not leave room for the concept of 'identical varieties'; in essence it refers to the competitors' products, whether identical or not clearly distinguishable by one or more important characteristics, and to the applicant's own products that are not so distinguishable (the case of identity would be dealt with under the novelty condition).

These provisions were slightly amended at the 1978 revision, whose principle purpose was to enable accession to the Union by further States, primarily the United States of America which, for the historical reasons outlined in this study, had developed a protection system that was not fully in line with the principles of the UPOV Convention.[80] Member States were authorized to reduce the four-year period arising from a priority claim in the case where the priority application was rejected or withdrawn--to eliminate any abuse of the priority provisions. The four-year period under the novelty requirement was extended to six in the case of trees and grapevine, and member States were given the possibility of introducing a one-year period of grace in respect of marketing in the State of application.[81] Furthermore, newly adhering States providing for protection under two forms for the same genus or species (through a special title of protection and patents) were given the possibility of continuing to apply the patentability criteria and the period of protection of the patent legislation to the varieties protected thereunder. This provision had been tailored for the United States of America in view of the unlikelihood of an amendment of the Plant Patent Act to bring it into conformity with the

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80 The Preamble to the International Convention for the Protection of New Varieties of Plants of December 2, 1961, as Revised at Geneva on November 10, 1972, and on October 23, 1978, contains the following statements:

> The Contracting Parties,
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> [...]
>
> "Considering that the idea of protecting the rights of breeders has gained general acceptance in many States which have not yet acceded to the Convention,
>
> "Considering that certain amendments in the Convention are necessary in order to facilitate the joining of the Union by these States,
>
> "Considering that some provisions concerning the administration of the Union created by the Convention require amendment in the light of experience,
>
> "Considering that these objectives may be best achieved by a new revision of the Convention."

81 The 1991 Act has reduced the four-year period arising from a priority claim to two years and made the one-year period of grace in relation to novelty mandatory (Articles 11(3) and 6(1)(i), respectively).

UPOV Convention; the United States of America were also the only State to make use of that provision.[82]

The forms of protection just mentioned were one of the major issues dealt with between 1957 and 1961. The Netherlands were strictly opposed to a system under the Paris Convention of 1883, owing to their opposition to patents in the field of agriculture.[83] Other countries were not ready to accept one form and exclude the other. It is significant in this respect that it was only in preparation for the second conference that the Government of Italy stated that some of the proposed provisions were incompatible with its previous commitments under the Paris Convention of 1883, and thereby clearly signalled its intention to use the patent system.[84] According to the report made by the Italian group of AIPPI to the AIPPI Congress of Vienna in 1952, a draft law to complement the Patent Law was under consideration at that time; it provided in effect for the introduction of a plant patent system comparable to that of the United States of America. But it also corresponded to a text drawn up by a joint Franco-Italian commission which met in December 1950. The time needed in France to pass a plant variety protection law[85] is a further indication that the matter was not finally decided even after the adoption of the UPOV Convention. Indeed it seems that France has considered for quite some time a solution along the lines of the system applied in the United States of America.

Throughout the preparatory work, the consensus among the experts was that member States should be free to choose the form of protection deemed most appropriate to their national circumstances. To that effect they did their utmost to adopt no provision which would prohibit the protection under the patent for invention. States choosing that form would be bound by two sets of obligations. And the majority of the experts had simply expressed the wish that, for varieties of the same botanical species, there should be only one form of protection in any given State.[86]

However, at the Conference of 1961, a text was adopted with the following wording (Article 2(1)): "Each member State of the Union may recognize the

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82 The 1991 Act no longer contains any provision on the forms of protection. The 1978 Act, through the derogations in respect of the patentability criteria and the period of protection under patent law, assimilated the United States plant patent to a form of protection under the Convention. This assimilation is no longer accepted in the 1991 Act. In its place, there is a possibility for the United States of America to make a reservation under Article 35(2).

83 See footnote 46 above. The same objection led to a provision in the Convention on the Unification of Certain Points of Substantive Law on Patents for Invention affording Contracting States the option of not providing, for a transitional period, for the grant of patents in respect of agricultural or horticultural processes.

84 See page 77 of the Acts of 1957-1961; 1972.

85 The law was adopted on June 11, 1970, and France was only the fifth country to ratify the UPOV Convention.

86 See in this respect, on page 70 of the Acts of 1957-1961; 1972, the report by Mr. J. Bustarret, President of the Committee of Experts.

right of the breeder provided for in this Convention by the grant either of a special title of protection or of a patent. Nevertheless, a member State of the Union whose national law admits of protection under both these forms may provide only one of them for one and the same botanical genus or species."

No explanation to this text has been recorded in the Acts, and this has created problems later on, in connection with the 1978 and 1991 revisions. For quite many years, its interpretation has been teleological and based on the fact that Belgium, France, the Federal Republic of Germany and Spain--the States which have granted patents in the past, but have introduced a special system of protection--have left open the possibility of obtaining a patent for invention in respect of a plant variety, restricting that possibility to the species not covered by the special system. According to that interpretation, "both these forms" would refer to patents not recognizing the right of the breeder "provided for in this Convention," which would entail a contradiction between the two sentences of Article 2(1). The literal interpretation made the provision irrelevant both for the past (since no State has introduced a dual system of protection) and for the future (since no State is likely to make the effort of introducing a specially-tailored piece of legislation and, at the same time, of adapting an existing one to the UPOV Convention). It is seems, however, that the provision has been included to cope with the situation in France which has been described above, which case the literal interpretation made sense in the context of that time.

In any event, it is the teleological interpretation which gave rise in 1978 to the special derogation for protection under two forms contained in Article 37(1) of the currently applicable text.[87]

The fathers of the Convention were also keen to introduce a system based on an examination of the variety undertaken by official services. This principle was to be softened later on to accomodate the system in force in the United States of America, and also to allow a broader coverage of the plant kingdom with the protection system.[88] It implied originally a progressive application of the Convention to the various genera and species. To ensure a certain degree of uniformity, they established a list of such taxa whose protection was to be achieved within a period of eight years. That list was to be deleted in 1978 as it was only relevant under west-european circumstances.[89] As a compromise, they also agreed that member States had to apply national

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87 "Notwithstanding Article 2(1), any State which, prior to the end of the period during which this Act is open for signature, provides for protection under the different forms referred to in Article 2(1) for one and the same genus or species, may continue to do so if, at the time of depositing its instrument of ratification, acceptance or approval of or accession to this Act, it notifies the Secretary-General of this fact."

88 See Records of 1978, p. 25.

89 The 1991 Act obliges its Contracting Parties to protect all genera and species within five years (States that are bound by the 1961 or 1978 Act and ratify the 1991 Act) or within 10 years (States and intergovernmental organizations that become members of UPOV on the basis of the 1991 Act) on which they become bound by the 1991 Act.

treatment in respect of the listed taxa, but were free to apply reciprocity in respect of the others.[90] For the purposes of Italy, a paragraph was added which enabled it to declare that it would apply Articles 2 and 3 of the Paris Convention of 1883.

The Organizational Set-up.- The patent controversy also reflected on the organizational set-up. Very soon it became clear that the emerging convention would not be placed under the umbrella of the Paris Convention of 1883 as strong opposition was voiced against this. The fathers of the Convention therefore decided to establish a separate Convention, with the necessary elements of harmonization as described above, and to set up a separate Union with a Secretariat which, "whilst maintaining its autonomy, could operate with [BIRPI], so that it could benefit of services that were already common to the two other Unions."[91] To this end it was provided in Article 25 of the UPOV Convention that the procedures for technical and administrative cooperation between UPOV and BIRPI would be governed by rules established by the Government of the Swiss Confederation in agreement with the Unions concerned.

Subsequent negotiations led to the present structure, in which the Director General of WIPO (the successor of BIRPI) is the Secretary-General of UPOV and is assisted by a Vice Secretary-General with a large degree of autonomy and a small number of collaborators. In the course of the 1978 revision, the status of UPOV, which--because of the large involvement of the Swiss Confederation as supervisory authority and of the extension to UPOV of certain arrangements made for BIRPI--may have been somewhat uncertain, has been updated, and UPOV was endowed with all features of a modern international organization, in particular with legal personality and capacity.

The Present Situation

The 1961 Act of the Convention was signed by the following States: Belgium, Denmark, France, Germany (Federal Republic of), Italy, Netherlands, Switzerland, United Kingdom. It entered into force on August 10, 1968, in respect of the first three countries which ratified it (Federal Republic of Germany, Netherlands, United Kingdom).

It was revised on November 10, 1972, by means of an Additional Act in respect of the financial provisions governing the Union and of the voting rights in the Council. There were then six member States: Denmark, France, Germany (Federal Republic of), Netherlands, Sweden, United Kingdom.

From October 21 to 23, 1974, the Council of UPOV organized a "Meeting Between Member and Non-member States,"[92] the purpose of which was to discuss

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90 This principle has been eliminated from the 1991 Act.

91 See in this respect, on page 70 of the Acts of 1957-1961; 1972, the report by Mr. J. Bustarret, President of the Committee of Experts. The Unions referred to are the Paris Union for the Protection of Industrial Property and the Berne Union for the Protection of Literary and Artistic Works.

92 Records published in UPOV publication 330(E), 1975.

the conditions under which other States would join UPOV. There were then still six member States. A decision to revise the Convention emerged by the end of the meeting.

The revision process took four years to the day: on October 23, 1978, a new Act was unanimously adopted by the then 10 member States (Belgium, Denmark, France, Germany (Federal Republic of), Italy, Netherlands, South Africa, Sweden, Switzerland, United Kingdom). The main amendments--which were quite limited in scope--have been described above. For all intents and purposes, the functioning of UPOV is governed today by the 1978 Act, although Belgium and Spain are still bound by the 1961 Act as amended by the 1972 Additional Act.

In October 1987, the Council decided to have a further Diplomatic Conference for the revision of the Convention. UPOV then had 17 member States: Belgium, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States of America.

The preparatory work took four years. When the Diplomatic Conference opened, on March 4, 1991, UPOV had three additional member States: Australia, Canada (which became a member on that very day) and Poland. The new Act (the 1991 Act was unanimously adopted on March 19 and subsequently signed by 12 States.

In the meantime, Czechoslovakia deposited its instrument of accession to the 1978 Act. It will become a member on December 4, 1991.

Argentina and Uruguay initiated the accession procedure and green light was given by the Council in October last.

PART II

THE RATIONALE FOR PLANT BREEDERS' RIGHTS

The rationale for plant breeders' rights has already been dealt with above to some extent in a historical perspective. Emphasis is regularly placed on the three following factors, but experience has shown that there are further ones:

(i) considerations of equity;

(ii) considerations of agricultural development;

(iii) considerations of public interest.

The considerations of equity

> "Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author."

We may accept with Murphy[93] that considerations of equity, even based on Article 27(2) of the Universal Declaration of Human Rights, may be dismissed as a motive for Government action. Yet it was mentioned in the Report of the Committee on Transactions in Seeds which was issued in the United Kingdom in 1960 and eventually led to the Plant Varieties and Seeds Act 1964. That report also drew a comparison with the situation of all other inventors and innovators, who were able to obtain a reward, whereas that possibility had been denied, for various, reasons to breeders.

The Considerations of Agricultural Development

It cannot be denied that improved varieties are an essential tool for the improvement of agricultural production in terms of quantity, quality, diversity and dependability. Yield increases brought about by new varieties have been quantified in various countries at about half the overall increase.[94] It should be remembered in this connection that improved crop husbandry can only exploit the in-build yield potential of plant varieties. Increases in quality (notably the baking quality) and radical changes (for instance double-zero rape) are exclusively or almost exclusively due to the breeders' efforts, as is also the introduction (or reintroduction) of certain crops into the agricultural landscape.

Although unchallengeable statistical evidence may be difficult to produce because of the effect of other factors, such as the incentives to the agricultural activity or the effect of the demand arising for instance from mechanization or from the needs of the market (industry, trade and consumers), it is undeniable that plant breeders's rights have been a strong and effective promoter in this.

The benefits arise not only in the field of plant breeding itself, but also in that of the seed trade, and they eventually accrue to the user.

The Benefits in the Field of Plant Breeding.- Several countries have reported sharp increases in the investments in plant breeding as a result of the introduction of plant breeders' rights, with a greater involvement of the private sector.[95] The level of research expenditures in plant breeding in

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93 Plant Breeders' Rights and the Improvement of Plant Varieties, in: The Use of Genetic Resources in the Plant Kingdom, UPOV publication No. 336(E), pp. 27-34.

94 Figures can be found in C. Mastenbroek, The Contribution of Plant Breeding to Food Production, in: The First Twenty-five Years of the International Convention of the Protection of New Varieties of Plants, op. cit., pp. 27-41 and, in respect of maize in Hungary, in L. Kálmán and M. Dickey, The Role of Plant Breeders' Rights in the Transfer of Technology - II, in: Seminar on the Nature of and Rationale for the Protection of Plant Varieties Under the UPOV Convention, Budapest, Hungary, September 19 to 21, 1990, UPOV publication No. 697(E), pp. 101-108.

95 So for instance P.W. Murphy, op. cit., who advances a 500% increase over five years. From 1967 to 1980, the number of members of the British Association of Plant Breeders (active in the agricultural and vegetable crops) rose from about ten to 23.

1988 has been estimated at 5.4% of the turnover in France, 5.1 in the EEC, 5.7 in the United States of America and 4.5 in the world, whereby it should be remembered that the EEC and North America (mostly UPOV member States) account for some 70% of the world seed market. The countries which grant plant breeders' rights represent 80% of innovative activities.[96]

It is noteworthy that the countries with the strongest breeding tradition and industries are those which have the longest tradition in protecting the breeders' interests either through plant variety protection legislation (Netherlands, Germany) or through a code of conduct, largely based on seed legislation, accepted by seed producers (France). The general feeling among them is that plant breeders' right have been material in their continued activities.

Those countries have also been able to maintain small and medium-size breeding enterprises. Lesser and Masson[97] suggested--in relation to the United States market--that hypotheses based on an assumed relationship between enhanced profits through breeders' rights and mergers seem inappropriate and that merger and divestiture activity appear to be an ongoing process better explained by ordinary events and the industry "life cycle" theory. This may have changed in the meantime as a result of certain reports by investment consultants, of the recognition of agriculture as a sustainable economic activity and of the prospects from genetic engineering; but this results first and foremost in increased investments.

This is certainly not true in relation to countries which do not protect the breeders' interests and offer low levels of guarantee in this respect.[98] Whilst mutual respect of two trading partners could be a substitute for plant breeders rights in the establishment of joint activities between Eastern and Western European enterprises, their role will be decisive in the future.[99] The same decisiveness should apply in relations with Latin America and between Latin American partners.

The increased number of breeding programs which enter into competition implies a diversification of the programs, with a resulting increased probability of obtaining superior and genetically diverse varieties. This is a strong counterbalance to the trend for uniformity that may be generated by the market demand in products.

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96 F. Desprez, A Plant Breeder's View--The Impact of Plant Breeders' Rights upon the Plant Breeding and Seeds Industries in an Enterprise Economy, in: Seminar on the Nature of and Rationale for the Protection of Plant Varieties Under the UPOV Convention, Budapest, Hungary, op. cit., pp. 87-94.

97 An Economic Analysis of the Plant Variety Protection Act, American Seed Trade Association, 1983, 127p.

98 B. Le Buanec, on the decision of Limagrain to cease its activities in Brazil, personal communication to Prof. D. Zylberstajn and the author.

99 J.E. Veldhuyzen van Zanten and G. Erdély, The Role of Plant Breeders' Rights in the Transfer of Technology - I, in: Seminar on the Nature of and Rationale for the Protection of Plant Varieties Under the UPOV Convention, Budapest, op. cit., pp. 97-98.

Plant breeders' rights also benefit public breeding. Public institutions use the system to generate income and optimize the exploitation of their varieties.[100] The income can be used as an argument to resist cutbacks in the programs.

More important is the possibility of organizing an optimal repartition of the tasks between the various partners.[101] In this respect, the purpose of plant variety protection under the Argentine law has been described as follows in the explanatory memorandum:

> "The Argentine outlook as to varieties has changed substantially in recent decades due to the activity of private and official phytogenetical improvers and to the introduction of new materials from other countries.
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> "However, it is considered that this action, although tremendously valuable and having contributed substantial benefits to national economy, can and must be increased and, in this sense, an increasingly important role is reserved for private enterprise, a role that may become preponderant so that the State may dedicate its greater efforts to basic research, to experimenting in the handling of varieties, in the use of fertilizers and irrigation, in the control of pests and diseases, etc., and especially in the propagation, promotion and extension of the new knowledge and materials among the producers in the various regions of the country."

The European States offer different models for such repartition, as well as examples of consultative decision-making processes involving all parties concerned.

The Benefits in the Field of the Seed Trade[102].- Plant breeders rights moralize the trade in seeds and plant material. Breeders will choose serious partners for seed production and combat sales in brown bags of their varieties--which constitute infringement of their rights. Their role is complementary to that of the catalogues of varieties authorized for sale and of seed certification, where such measures have been introduced.

Collectively, breeders organize the seed trade, possibly through licensing societies such as ARPOV in Argentina.

The genetic progress embodied in a variety is not the only key to its success. It must also be marketed properly. The countries in which plant

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100 For the recourse of the Argentine INTA to plant breeders' rights and related matters, see M.B. Guttierrez, La experiencia Argentina en la proteccion juridica de la propriedad de la variedades de plantas, contribution to the Second National Seed Seminar, Santa Fe de Bogotá, May 30-June 1, 1991.

101 This subject has been discussed by A. Cauderon in Plant Breeding: a Common Undertaking for Public Laboratories, Breeding Firms and Users of Varieties, in: The First Twenty-five Years of the International Convention of the Protection of New Varieties of Plants, op. cit., pp. 43-49.

102 This issue is discussed in particular by F. Desprez, op. cit.

breeders' rights have been successful had their seed production and distribution infrastructure improved considerably. It is able to cope with poor-quality harvest and to respond to brutal changes in demand (for instance after a crop failure at the early stages).

The quality standards set by the variety and seeds industry itself in some highly competitive markets are sometimes higher than the official ones.

The Benefits to the Primary Users.- The farmer does not just receive a genetic potential in a high quality seed. In the highly competitive markets, breeders also offer fringe benefits, for example in the form of crop insurances; they undertake extension activities, in particular comparative trials, and provide detailed technical information on crop management.

In the case of the specialized crops, when the breeder can also control the final product, producers under licence can claim from the breeder that he guarantees the peaceful enjoyment of the licence, that is to say, he can make claims for a secure production and marketing operation--of course within the limits set by the agroeconomic vagaries.

The Benefits in Terms of Transfer of Technology and Know-how.- Plant breeders' rights play an essential role in the introduction of foreign varieties which enrich the assortment available to the farmer and contribute to the improvement of agricultural production, both in permitting such introduction and in speeding it up.[103]

Foreign breeders also take a more direct interest in breeding activities in the country, in particular since breeding in the environment in which the resulting varieties are to be used is more effective. This is done both through the creations of subsidiaries and through partnership agreements. In both cases there is a flow of technology and know-how, in both directions (subsidiaries having to rely on the local seed trade).

In certain cases, plant breeders' rights promote specialization. For instance, France, Hungary and the United States of America are major maize seed producers; Denmark has specialized in perennial ryegrass; the Netherlands are leaders in flower bulb production, etc. In this respect, there are certainly assets in Latin America which await proper exploitation in a context which is in any way going towards free trade.

The Considerations of Public Interest

Considerations of public interest have played a major role in the success of the 1957-1961 Diplomatic Conference. It should be remembered that, at the time, many European countries were still excluding inventions in the field of the basic needs of mankind, notably those relating to foodstuffs and pharmaceutical products, from patentability. For many years, in particular under the influence of the founding fathers of the Convention, the rationale of a

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103 L. Kálmán and M. Dickey, op. cit., give some figures in respect of the introduction of maize hybrids into Hungary. They suggest that the so-called in-built protection offered by hybrids is not so much relied upon.

special Convention and a special form of protection was seen in the limited scope of protection afforded to the breeder.

The Limitation of the Scope of Protection Vis-à-vis Other Breeders.- This limitation is usually called 'breeder's exemption.' A protected variety may be used freely for breeding purposes, i.e. as a genetic resource. Limitations to this principle only concern the exploitation of certain varieties bred under the exemption and are designed to protect the opportunities for the breeder of the protected variety to obtain a proper reward.

The 'breeder's exemption' is a cornerstone of the protection of the intellectual property in the field of plant varieties: genetic progress can only be achieved if the material produced at any stage of development, in particular the most recent one, can be used as the basis for further breeding work. It is certainly of lasting importance.

The 'breeder's exemption' is the basis for the finding that the Argentine Seeds and Phytogenetic Creations Law "does not interfere with the exchange and use of germplasm"[104] and for the conclusion of the FAO International Commission on Plant Genetic Resources that plant breeders' rights as provided for under the UPOV Convention are not incompatible with the International Undertaking on Plant Genetic Resources.[105]

The Limitation of the Scope of Protection Vis-à-vis Users.- Agreement could be reached in 1961 on a minimum scope of protection only, covering the production for purposes of commercial marketing, the offering for sale and the marketing of generative or vegetative propagating material, as such, of the protected variety. A more extended protection covering the final product in the case of ornamental plants had been advocated by some delegations, but was not acceptable to the majority.

Two decades of experience in States which have adopted the minimum scope, on the one hand, and States like France which have extended protection to cut flowers, on the other, have shown that the initial misgivings were not justified.

In the light of the current trends in trade negotiations and enforcement of intellectual property rights, the extension of protection to the cut flower will be an important objective for the flower-exporting countries.

The minimum scope of protection defined in the 1961 and 1978 Acts of the Convention also implies a 'farmer's privilege,' i.e. the possibility for farmers to produce their own seed or planting material without having to seek an authorization from the breeder and pay him a royalty. The political sensitivity of the issues involved must be acknowledged. This was the reason for the inclusion of a provision in the 1991 Act whereby "each Contracting Party

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104 Explanatory memorandum to Law No. 20.247 of March 30, 1973.

105 Resolution 8/83 of the twenty-second session of the FAO Conference (November 5-23, 1983) and Agreed Interpretation of the International Undertaking included in the report on the twenty-fifth session of the FAO Conference.

may, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or a variety" that is essentially derived from the protected variety or not clearly distinct from it.

However, such a privilege may have major drawbacks in the perspective of national economy. It might totally undercut the ability of the breeder to recoup his investments in the case of crops grown on a relatively small area and in which propagation is easy, in particular in the case of fruit crops and vegetables.

In the case of small grain cereals, there seems to be a broad inverse correlation in UPOV member States between the strength of the breeding programs and agricultural productivity, on the one hand, and the use of farm-saved seed, on the other. It is also suggested that some cereal breeding programs might be discontinued for lack of profitability in the United States of America, where the 'farmer's privilege' includes the possibility of selling seeds under certain broad conditions.

The 'farmer's privilege' associated with certain agroeconomic conditions has also given rise in some member States to contractual cleaning, either on the farm with mobile seed cleaners or in plants. Contractual cleaners do not contribute to the strength of the seed trade, but rather undermine its capacity to respond to extraordinary needs.

The experience of some member States, in particular France where statistics on the use of certified seeds are available for each administrative region (départements) is also that the recourse to the 'farmer's privilege' is very unequal. In particular, farmers in areas where agriculture is difficult and cereal production marginal use more certified seeds than farmers in some of the major cereal production areas. In other words, genetic progress is paid by the former whereas the latter takes maximum advantage from it. One cereal production area shows a strikingly high use of certified seeds; this is due to an active promotion and extension activity on the part of the local agricultural cooperative which provides the inputs for crop production and collects the harvests.

This suggests that the 'farmer's privilege' may be a problem of perception rather than one of need. Developing countries with an important subsistance farming may have a special problem. In this respect, it is frequently claimed that the 'farmer's privilege' is essential because subsistance farmers cannot afford buying seeds. This opinion needs careful examination. Where the genetic potential of the crop is a limiting factor, it seems that the subsistance farmers would be much better assisted if they were given access to genetic progress. In France, the use of a protected variety of wheat costs the farmer some 40 French francs per hectare, or 40 kg of wheat, whereas the national average yield exceeded 6.5 tonnes per hectare in 1990 (they were at about 4 tonnes when the plant breeders' rights system was introduced).[106] This cost/benefit ratio alone is an incentive and shows the power of the plant breeders' right system as a tool for national economic development.

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106 F. Desprez, op. cit.

THE UPOV CONVENTION - THE SCOPE OF PROTECTION AND ITS GENERAL PROVISIONS

Mr. Chairman, Ladies and Gentlemen,

I am asked to address you on the subject of the UPOV Convention, its scope of protection and its general provisions.

First then, what is "UPOV" and what is the "UPOV Convention?"

The name UPOV is an acronym derived from the French translation of the words "Union for the Protection of New Varieties of Plants." UPOV is an international intergovernmental organization. This means that its members are States and not private associations or private individuals. UPOV is an independent organization with international legal personality. Its headquarter is in Geneva where it employs its own staff.

UPOV cooperates very closely in administrative matters with the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. The Secretary-General of UPOV is the Director General of WIPO, the UPOV headquarter is in the same building as WIPO, and UPOV receives a range of support services from WIPO.

The basis of UPOV's existence is the International Convention for the New Varieties of Plants, which was signed on December 2, 1961, and revised in 1972 and 1978 ("the 1978 Act").

This is the UPOV Convention that is in force. However, at the outset, I must explain that, in March this year, a Diplomatic Conference was held in Geneva which resulted in the unanimous adoption by the member States of UPOV of a new revised 1991 Act of the UPOV Convention ("the 1991 Act"). This new 1991 Act will not come into force until five States have acceded to it and even when it comes into force it will only bind States which have chosen to accede to it. Existing member States will only become bound by the 1991 Act when they have modified their existing laws and deposited an instrument of accession to the new Act.

My initial remarks will be limited to the 1978 Act. This is the Act which binds all existing member States of UPOV, which is the basis of the existing UPOV system of plant variety protection and to which UPOV expects a number of new member States to adhere in the years immediately ahead. The Governments of Argentina and Uruguay, for example, recently asked the Council of UPOV to advise them concerning the conformity of their laws for the protection of new plant varieties with the 1978 Act of the UPOV Convention. If and when they deposit an instrument of accession, they will accede to the 1978 Act of the Convention and not to the new 1991 Act.

The 1978 Act is, in effect, an agreement between States under which States adhering to the Convention undertake to create a system for the grant of plant breeders' rights, within their domestic laws, in accordance with internationally agreed and uniform principles. Each UPOV member State must entrust the granting of breeders' rights to an appropriate administrative unit. Under the 1978 Act, plant breeders' rights are granted in each member State for its own territory. They are not granted on an international basis.

The Criteria for Protection

The 1978 Act provides a system for the protection of a new plant variety, that is to say, the physical unit of plant material selected by the plant breeder with its set of morphological and physiological characteristics. If a legal right is to be granted in respect of the unit of plant material that constitutes a plant variety and if that right is subsequently to be effectively enforced, the identity of the plant material must be established beyond doubt. When seeking to conclude whether particular plant material constitutes or belongs to a "variety" the classifier must exercise judgement but inevitable elements in making a judgement will always include the extent of its distinctness from other material, its uniformity in the sense that variations from a standard description are within reasonable limits and its stability in the sense that it will retain its distinguishing features from one generation to the next. The 1978 Act accordingly requires in Article 6 that member States adopt the three criteria of distinctness, uniformity (the 1978 Act uses the word "homogeneity") and stability as the technical basis for the protection of plant varieties and adds the further two requirements of commercial novelty and the submission of an acceptable denomination for the variety, a total of five criteria for protection. The technical criteria will be covered in detail by subsequent speakers. I will however deal with novelty and the denomination.

A variety must be commercially novel to secure protection. Article 6(1)(b) of the 1978 Act provides that the variety must not, prior to the date of application, have been offered for sale or marketed with the agreement of the breeder in the territory of the state where the application in question has been filed. States are, however, given a choice in relation to this provision and are permitted, if they wish, to permit varieties to be offered for sale or market in their own territories for a maximum of one year prior to the date of application. In addition, the variety must not have been offered for sale or marketed with the agreement of the breeeder in the territory of any other state for longer than six years, in the case of certain woody species, or for four years in the case of all other plants. These periods of grace relating to commercialization in other countries, recognize the lengthy nature of trials to ascertain the agronomic value of varieties and enable the breeder to carry out necessary trials before making an application for protection without prejudicing his right to protection.

The novel variety must be given a denomination in accordance with the provisions of Article 13 of the Convention. Article 13 provides that the variety must be designated by a denomination which is destined to be its generic designation and it establishes rules designed to ensure that, in the interests of growers and consumers, this denomination does indeed provide a clear-cut generic designation. Thus the denomination may not consist solely of figures, except where this is an established practice for designating varieties of a particular species. It must not be liable to mislead or cause confusion concerning the characteristics of the variety or its value or identity and it must, of course, be different from every designation which designates in any UPOV member State another variety of the same species or of a closely related species.

The technical criteria of distinctness, uniformity and stability, and the further criteria of commercial novelty and the establishment of a denomination accordingly represent the standard conditions that must be fulfilled to secure protection for a new plant variety under the laws of UPOV member States. The 1978 Act provides in Article 6(2) that, provided the breeder complies with its necessary formalities, a UPOV member State may not make the grant of protection subject to conditions other than the five conditions described above.

The Scope of Protection

Article 5 of the Convention establishes the nature of the rights that member States undertake to grant to breeders. Breeders must be, in effect, given the exclusive right to produce reproductive or vegetative propagating material of their varieties for the purposes of commercial marketing and the exclusive right to offer for sale and market their varieties. The breeder's right is limited to the production and sale of reproductive or vegetative propagating material of his variety. The breeder does not, for instance, in the case of a cereal variety, have the exclusive right to sell grain of that variety, but only seed. It is a question of fact to be established by evidence whether a sale is of seed or grain. A further very important aspect to note here is that the breeder's exclusive right relates only to production for the purposes of commercial marketing. If production of reproductive material is not for the purpose of the commercial marketing of the material or if such material is not marketed, it is not covered by the breeders' rights so that a farmer, for instance, who produces seed on his own farm for the purposes of resowing on his own farm, can do so freely without obligation to the breeder.

The 1978 Act only establishes the minimum scope of the right that States must grant. Member States are expressly permitted, under their own laws, if they so wish, to grant to breeders of a particular genera or species, a more extensive right than that described above, even extending to the marketed product of the variety. In practice, however, few states have availed themselves of this right.

Article 5 further provides that any authorization given by the breeder in relation to the production or marketing of his variety may be made subject to such conditions as he may specify. The breeder is thus to be free to decide whether he will exploit his exclusive right by producing and selling all the reproductive or propagating material of his variety that is needed by the market or whether he will grant licences to others, perhaps in exchange for a royalty. The practice in individual States varies. In many countries, in relation to species where very large volumes of seed must be produced and sold, and where the ease of keeping their own seed influences the price which farmers will be prepared to pay, the practice of plant breeders is to select the least-cost method of production and distribution. For example, in the case of small grain cereals, in most European countries, licences are granted very widely to organizations such as local cooperatives and grain merchants, who provide a wide range of services and supplies to farmers. Organizations of this kind produce seed locally under contract and sell it back to local farmers thus minimizing the cost of transportation. The breeder is content to receive a royalty on each ton of seed which is sold. In the case of more specialized seed production such as the production of some cross-pollinating species, or of hybrid varieties or of high-quality vegetable seed, the practice of the breeder will probably be to control very tightly the production of seed in order to maintain the quality and reputation of his variety. In these cases he will seek his reward directly in the price of the seed. Many different situations exist, however, depending upon the commercial structure of seed distribution in each country and the logistical aspects of the production and distribution of a particular species. The 1978 Act is silent on all these marketing questions. It simply requires of UPOV member States that they permit breeders to specify conditions of licenses for their varieties.

Article 5(3) of the 1978 Act contains a truly fundamental principle. It states that the authorization of the breeder shall not be required for the utilization of the variety as an initial source of variation for the purpose

of creating other varieties. The only permitted exception to this rule arises when the repeated use of the variety is necessary for the commercial production of another variety. This limited exception relates to the use of an inbred line in the commercial production of seed of a hybrid. The free availability of protected varieties as a germplasm source for other breeders is a fundamental tenet of the 1978 Act and demonstrates that its authors were agriculturalists who were totally aware of the nature of plant breeding and of the manner in which incremental progress is achieved by building upon the progress embodied in existing varieties.

The 1978 Act requires States to grant a minimum period of protection of 18 years in the case of vines, forest trees, food trees, and ornamental trees and 15 years in the case of all other species.

The 1978 Act does not immediately impose its member States the obligation to protect all botanical genera and species. The 1978 Act states that its provisions may, and here I emphasize may, be applied to all botanical genera and species, but it does not require member States to protect all botanical genera and species. What it does require is that member States apply the Convention to a minimum of five genera when first acceding to the UPOV Convention and that, over a period of years, they progressively apply the Convention to a greater number of species. Most member States protect all species of economic importance in their countries and, in an increasing number of cases, protect the entire plant kingdom.

Article 10 of the 1978 Act includes amongst its provisions one to the effect that the breeder of a protected variety shall forfeit his right if he is no longer in a position to provide the authorities with reproductive or propagating material capable of reproducing the protected variety with its morphological and physiological characteristics as defined when the right was granted. In other words, the breeder must competently maintain his variety if he wishes to retain the benefit of protection.

Article 2 of the 1978 Act provides that a state may provide protection for plant varieties in the form of plant variety protection or of a patent but once it has opted to protect varieties of a species by plant breeders' rights it may not subsequently protect varieties of that same specie by patent. This is the so-called prohibition on "double protection." I refer to it in a simplified form for present purposes. Subsequent contributions in this Seminar will deal with this subject in more detail.

Article 3 of the 1978 Act states that each member State must accord to nationals and residents of other member States the same treatment as far as the recognition and protection of their varieties are concerned as that which it accords to its own nationals.

Article 7 of the 1978 Act provides that member States shall only grant protection after the examination of the variety in the light of the criteria of distinctness, uniformity, stability and commercial novelty which I have referred to. This provision has been interpreted to mean that member States should require a growing test which should be conducted either by the State or by the breeder provided that the test follows relevant guidelines and that the breeder is required to supply a sample of the variety at the time of application and to permit persons authorized by the State to visit the trials. Subsequent speakers will address the topic of the examination of varieties in detail.

Article 9 of the 1978 Act provides that UPOV member States may not restrict the exercise of the exclusive right accorded to the breeder otherwise than for reasons of public interest and that, where any such restriction is imposed, the member State involved shall take all necessary measures to ensure that the breeder receives equitable renumeration.

Article 10 of the 1978 Act provides that the right of the breeder should not

(i) be annulled unless it is shown that the variety did not fulfill the commercial novelty and distintness requirements when the rights were granted,

(ii) be cancelled unless the breeder fails to maintain the variety or pay the necessary fees.

Article 12 of the 1978 Act requires member States to establish rules giving priority for a period of 12 months to an application for a variety where an application has already been filed for that variety in another country. This means that an application in a member State must be treated as if filed on the date of an earlier application in another member State for which priority is claimed.

Article 14 of the 1978 Act provides that the grant or refusal of breeders' rights for a variety must be independent from the regulation in any UPOV member State which are concerned with the production, certification and marketing of seeds.

Articles 1 to 14 of the 1978 Act are the Articles which establish the main legal rules which the member States of UPOV undertake to incorporate into their national laws. The remaining provisions are for the most part concerned with the establishment of UPOV and its management.

I am sure you will wish to know how a State can become a member of UPOV. First, the State must have enacted and be in a position to implement a law on plant variety protection which conforms with the rules established in the particular Act of the UPOV Convention to which it wishes to accede and it must then ask the Council of UPOV to advise it in respect of the conformity of its laws with that Act. If the Council's advice is positive, the State in question must then deposit an instrument of accession to that Act of the Convention (a form of legal document) with UPOV and provide certain information to UPOV including its proposed basis for financial participation. It will become a member of UPOV one month later.

The period since 1961 has seen a steady growth in the number of States which are members of UPOV. Today UPOV has 21 member States. Argentina and Uruguay have modified their laws so as to conform with the UPOV Convention with a view to joining UPOV. The European Economic Community is in the process of elaborating a Community Plant Breeder's Right, which will enable the grant, pursuant to a single application filed in a central Community Breeders' Rights Office, of a breeder's right effective in all the 12 member States of the EEC. Austria, Bulgaria, Finland, Morocco, Norway, Portugal, Romania, Turkey, and the USSR have prepared draft laws on the protection of plant varieties. Kenya has had a plant breeders' rights law in its statute book for many years which has not been activated, but recent communications tell us that this law is now to be activated. We can thus hope to see something in excess of 30 countries with laws for the protection of new plant varieties, which conform with the UPOV Convention, by the mid-1990s. These countries will all have

reached a decision to adopt a plant breeders' rights law after detailed and careful consideration of their national circumstances. They will all probably have concluded that plant breeding needs to be conducted in most cases within their national borders if they wish to secure the maximum benefit from the potential offered by plant breeding and that a system of incentives to plant breeders will bring about an increase in the total amount of plant breeding relevant to their territories. Such breeding, being undertaken in programs which are independent from each other, is likely to have diverse breeding objectives and deploy diverse genetic sources.

I commend to you the 1978 Act of the Convention which is receiving increasing recognition throughout the world.

The question immediately arises: "Why should it be necessary to revise such an excellent Convention and what changes have been incorporated into the new 1991 Act of the Convention?" I will deal very briefly with these questions now but they will be considered in more detail in other contributions to this Seminar.

First, under the system of the 1978 Act, it is possible for breeders to discover that their particular varieties cannot be protected in some countries because the species in question is not protected in that country. The 1991 Act provides for the eventual protection in all UPOV member States of all plant genera and species.

Secondly, under the 1978 Act, the breeder's protection enabled him only to control marketing of the reproductive material of his variety and production of such material for the purpose of marketing. A number of difficulties arose with this formulation of the breeder's right. It had the advantage for farmers that the production of seed on their farms for sowing on their farms fell outside the scope of protection but it had the effect also that a person could buy one fruit tree and use it, after propagation, to plant a vast orchard with no obligation to the breeder. The modern techniques of tissue culture multiplies the potential for this kind of misuse of the breeder's variety. The 1991 Act accordingly extends the breeder's protection to all production and reproduction of his variety BUT permits member States on a discretionary basis to except from the breeder's right any traditional form of saving seed on the farm which they wish to retain.

Thirdly, under the 1978 Act, a variety can be taken to a country which does not provide protection for new plant varieties and used there to produce an end product, say, cut flowers, which is exported back to a country where the breeder's variety is protected. The breeder receives no remuneration from the exploitation of his variety in this way. The 1991 Act extends the breeder's protection in very limited circumstances to the harvested material of his variety so as to enable him to seek some reward from the exploitation of his variety in the kind of circumstance described above.

Fourthly, under the 1978 Act, a protected variety can be modified in a very limited respect, e.g. by reselection, mutation, the addition of a gene etc., and, provided the modified variety is clearly distinguishable from the protected variety, it can be separately protected without any obligation to the breeder of the protected variety. The 1991 Act provides that varieties that are "essentially derived" from a protected variety in this way can still be protected but cannot be exploited without the permission of the breeder of the protected variety from which they are derived. Varieties are "essentially derived" for this purpose only when they are virtually entirely constructed

upon the basis of the protected variety from which they are derived. This provision is designed to discourage parasitical breeding approaches.

There are other changes in the 1991 Act but the changes to which I have referred are the major substantive changes to which we must direct our minds.

I think that the changes which have been made are very rational and that they will provide plant breeders with a form of protection adapted to the needs of the Twenty-First Century but one which still represents a fair balance between the interests of breeders, farmers, and society at large.

THE UPOV CONVENTION - THE CONCEPT OF VARIETY AND THE TECHNICAL CRITERIA OF DISTINCTNESS, UNIFORMITY AND STABILITY

Introduction

The UPOV Convention states that its purpose is to recognize and protect the rights of the breeder of a new plant variety in so far as certain conditions are met.

In this exposé we shall consider the basic requirements to be met by a plant variety to qualify for protection, namely that it be distinct, uniform and stable. We shall also attempt to explain the plant variety concept in terms of the UPOV Convention, and to describe the methodology devised by the Union for the testing of the three requirements mentioned.

The Variety Concept

In the 1961 text of the Convention, Article 2 specifies the meaning that the word variety has for the purposes of the Convention, establishing that it applies to any cultivar, clone, line, stock or hybrid that is capable of cultivation and satisfies conditions laid down in other articles (it must be homogeneous and stable).

The above explanation was not retained in the Convention as revised in 1978; its Article 6 merely set forth the conditions to be met by a variety to qualify for protection, providing again that it had to be distinct, homogeneous and stable.

So neither the 1961 nor the 1978 text included an express definition of the plant variety.

During the preparatory work on the Diplomatic Conference that revised the UPOV Convention in March 1991, much emphasis was placed on the desirability of the Convention containing a definition of the plant variety for the purposes of its own provisions.

Before commenting on this and describing how the plant variety eventually came to be defined in the text of the Convention as revised in 1991, it is perhaps advisable to remind ourselves that any attempt to establish a variety concept has to take a number of different viewpoints into consideration. To do this I am going to adopt the method of summarizing the formula that the Office of UPOV devised in document PM/1/3 of April 20, 1990, in the course of the preparatory work on the revision of the Convention.

From the point of view of taxonomy, the species is considered the basic unit of classification and nomenclature. According to von Wettstein, a species is a group of individuals whose descendants resemble them as much as they resemble each other, in all the characteristics that appear to be important to the observer. Two or more similar species form a higher group known as a genus. That is followed by a succession of larger groups, making up the family, the order, the class and the division. Successive subdivisions may also be formed within the species, like the subspecies, the convariety, the (botanical) variety, the subvariety, the form and so on.

Considering now what might be called the economic or the user's viewpoint, the following could be taken as a definition:

> "A variety is a subdivision of the species which is distinguished for the purposes of the exploitation of the plant resources of the species."

Certain conditions are implicit in this definition, namely that the variety be useful, distinct, homogeneous and stable.

From the standpoint of genetics and plant breeding, which has much to do with our subject, we could consider the definition proposed in 1990 by A. Gallais:

> "From the plant breeding point of view, a variety might be considered an artificial population with a narrow genetic base, with rather well-defined agronomic characteristics, which is reproducible with more or less precision following a predetermined method of production."

Finally, from the standpoint of the production of seeds and nursery plants, the variety concept is variable at two levels:

1 - the level of a plant entity being recognized as a variety;

2 - the level of certain material being recognized as belonging to a specific variety.

Before the UPOV Convention was revised in 1991, as I have already mentioned, it became clear that a definition of the variety figuring in the revised text was desirable and necessary.

As the variety was the thing actually protected, it seemed logical that the new Act should expressly include the notion of the variety and define it. Other circumstances also militated in favor of inclusion. Certain legal provisions regulating the grant of patents at the national and regional levels, such as the European Patent Convention, exclude plant varieties, among other things, from protection; and as the plant variety was not defined, problems could arise with the demarcation of the areas of application of the legal systems affording protection to plant varieties on the one hand and patents on the other.

The working out of a definition for the variety turned out to be complex and highly laborious, requiring the setting up of an ad hoc committee at the Diplomatic Conference. In the end, among the various definitions written into Article 1 of the Convention as revised in 1991, it was provided that, for the purposes of the Convention,

> "(vi) 'variety' means a plant grouping within a single botanical taxon of the lowest known rank, which grouping, irrespective of whether the conditions for the grant of a breeder's right are fully met, can be
>
> - defined by the expression of the characteristics resulting from a given genotype or combination of genotypes,
> - distinguished from any other plant grouping by the expression of at least one of the said characteristics and
> - considered a unit with regard to its suitability for being propagated unchanged."

So, as we see, a definition of the plant variety has been worked out and adopted that is broader than the "protectable plant variety" under the Convention. The variety will in addition have to fulfill the requirements of being distinct, homogeneous, stable and new (neither marketed nor offered for sale) as required by Articles 5, 6, 7, 8 and 9.

As a result of the consensus achieved, there remains in the Convention a definition that of necessity retains sufficient flexibility to accommodate the various forms that the existing types of variety will take, at the same time allowing for and effectively satisfying expectations and clearing up the assortment of situations that caused the inclusion of an express definition to be desirable.

So groups of plants and varieties are included in the definition of the plant variety that do not necessarily qualify for protection if they do not also meet the requirements of distinctness, novelty, homogeneity and stability.

When considering the variety concept in the context of infringements of breeders' rights, marketed material different, but not clearly distinguishable, from the variety should be regarded as still belonging to the variety.

In Article 14 of the Convention as revised in 1991, the notion of "essentially derived variety" has been introduced. This new concept has a bearing on the scope of the rights granted to the breeder of a protected variety.

The Convention now provides that:

"... a variety shall be deemed to be essentially derived from another variety ('the initial variety') when

(i) it is predominantly derived from the initial variety, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety,

(ii) it is clearly distinguishable from the initial variety and

(iii) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.

"(c) Essentially derived varieties may be obtained for example by the selection of a natural or induced mutant, or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, or transformation by genetic engineering."

According to the provisions of the new Article 14, the material of an essentially derived variety is subject to the same system whereby the breeder of the original variety has to authorize the performance of a number of acts, which introduces a sort of dependency in relation to the original or initial variety.

The new concept as described does not alter the variety concept. One might, in relation to the effects of the rights, have expected some broadening of the definition of the variety, but there is none: what has been broadened in fact is the scope of the rights accorded to the breeder or owner of the initial variety.

Because of its novelty and importance, the new concept and also its effects will have to be thoroughly analyzed and developed. The Diplomatic Conference itself adopted a resolution to the effect that work should start immediately within UPOV on the drafting of provisions and guidelines on essentially derived varieties; that work has indeed already started.

Technical Criteria of Distinctness, Uniformity and Stability

All three versions of the UPOV Convention, those of 1961 and 1978 and the recent 1991 revision, have required, for a plant variety to qualify for the protection afforded by the system, that it be:

- new,
- distinct,
- homogeneous,
- stable.

In the 1978 text, the one now in force, Article 6 is devoted to the establishment of those requirements:

Distinctness:

> "(a) Whatever may be the origin, artificial or natural, of the initial variation from which it has resulted, the variety must be clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge at that time when protection is applied for..."

Novelty:

> "(b) At the date on which the application for protection in a member State of the Union is filed, the variety
>
> (i) must not--or, where the law of that State so provides, must not for longer than one year--have been offered for sale or marketed, with the agreement of the breeder, in the territory of that State, and
>
> (ii) must not have been offered for sale or marketed, with the agreement of the breeder, in the territory of any other State for longer than six years in the case of vines, forest trees, fruit trees and ornamental trees, including, in each case, their rootstocks, or for longer than four years in the case of all other plants.
>
> "Trials of the variety not involving offering for sale or marketing shall not affect the right to protection. The fact that the variety has become a matter of common knowledge in ways other than through offering for sale or marketing shall also not affect the right of the breeder to protection."

Homogeneity:

> "(c) The variety must be sufficiently homogeneous, having regard to the particular features of its sexual reproduction or vegetative propagation."

Stability:

> "(d) The variety must be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation or, where the breeder has defined a particular cycle of reproduction or multiplication, at the end of each cycle."

In the Convention as revised in 1991, Articles 6, 7, 8 and 9 cover the aspects that we are concerned with, namely novelty, distinctness, uniformity and stability respectively.

As the purpose of this exposé is to enlarge on the technical criteria of distinctness, uniformity and stability, we shall now look at the reality of how they were dealt with in the recently approved new text (of March 19, 1991).

Distinctness

Article 7 of the 1991 text provides that:

> "The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application. In particular, the filing of an application for the granting of a breeder's right or for the entering of another variety in an official register of varieties, in any country, shall be deemed to render that other variety a matter of common knowledge from the date of the application, provided that the application leads to the granting of a breeder's right or to the entering of the said other variety in the official register of varieties, as the case may be."

Two changes should be pointed out in the new text. First, the adjective "important" qualifying the characteristic or characteristics determining distinctness in the 1978 text has been removed. According to practices and interpretations observed up to now, the epithet "important" has related to the actual distinguishing of varieties and not to the economic or practical interest or relevance that the characteristic serving to distinguish varieties might have.

The second thing that should be mentioned is the change written into the new Article 7 concerning the notion of "common knowledge" or of the existence of a variety being a "matter of common knowledge" for the purpose of determining the distinctness of a variety before rights are granted to the breeder or his successor in title. This change, the implications of which are being thoroughly analyzed, may well call for certain procedural changes; in particular it seems that it will intensify information exchange among the protection offices of member States, and could perhaps highlight the desirability of some centralization or cooperation in the preliminary examination of varieties.

Notwithstanding the above two changes, it does not appear necessary to impose any change in the systems and executive procedures that now govern the practical aspects of the technical work involved in testing distinctness.

Uniformity

Article 8 of the 1991 text provides that:

> "The variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics."

There is no change of practice in relation to the requirement in the 1978 text that we saw earlier.

Stability

This requirement is described in Article 9, which provides that:

> "The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle."

This condition has likewise not changed appreciably in relation to the 1978 Act.

Preliminary Examination

Both Article 7 of the 1978 text and Article 12 of the 1991 text make the grant of rights to the breeder of a variety subject to the establishment by examination that the prior conditions of novelty, distinctness, uniformity and stability are fulfilled.

This examination has come to be known as the "preliminary examination."

Various methods have been recognized for the conduct of the examination or set of trials for the testing of distinctness, homogeneity or uniformity and stability. It may be carried out entirely by the competent authority in each member State, entrusted to another agency or to the competent authority of another State, carried out by the applicant for protection under the supervision of and subject to endorsement by staff of the competent authority, or again carried out entirely by the applicant according to testing systems and procedures laid down by the competent authority or agency, with the possibility of supervision by the latter.

All these methods of carrying out examination are to be found in the 20 member States of the Union, being known as "DUS testing" or "essais DHS" in French or "ensayos DHE" in Spanish.

The UPOV System for the Testing of Distinctness, Uniformity and Stability

In view of the fact that it was an essential requirement, before a variety was afforded protection or a breeder granted rights, to have made a genuine check on compliance with the requirements of distinctness, homogeneity and stability, UPOV has devoted special attention since its creation in 1961 to the development of a technical system which, on being adopted by its member States, would bring about the harmonization of testing methods and procedures, with the result that test and examination findings would be comparable, and if necessary standardized and made acceptable to States other than the one that did the work.

A Technical Committee was set up within UPOV as a standing body reporting to the Council. One of its main tasks was to devise a system of variety identification for the testing of distinctness, homogeneity and stability of varieties in the plant species for which protection was being introduced.

The Technical Committee set up a number of specialized Technical Working Parties for the further development of its work. At present there are five in operation for various groups of species, four of them for agricultural, vegetable, fruit, and ornamental and forest species respectively. The fifth is specialized in computerization matters and does horizontal back-up work for the other four.

From 1970 onwards, technical experts specialized in variety identification from UPOV member States carried on their work with great diligence and efficiency, and succeeded in devising the present system, which we could call the UPOV system, for variety identification and the testing of distinctness, uniformity and stability of new varieties of plants.

The system has to date covered 140 economically interesting cereal, fodder, textile, oil-bearing, industrial, fruit, ornamental, aromatic and vegetable species. The work is still going on, concentrating now on methods applicable to new species, at present 28 in number, and on the revision of some of the existing Guidelines where necessary.

Let us now consider in some detail the system that has proved its effectiveness through application by UPOV member States on the five continents, and which has enabled breeders' rights to be granted for several thousand varieties without any noticeable operational problems.

The system consists in UPOV working out a method for testing the distinctness, uniformity and stability of varieties of the various species or genera, which is published in what are known in English as the "UPOV Test Guidelines." These Guidelines, the drafting of which involves technical experts from the member States, are adopted by the UPOV Technical Committee and their use is recommended to the authorities responsible for protection.

In the document issued by UPOV called "Revised General Introduction to the Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties of Plants," a detailed description is given of the system which thereafter is developed in the actual Guidelines drawn up for each species or genus.

In essence, and with the necessary simplification, the system could be described as follows: the UPOV method consists essentially in establishing a List of Characteristics or features for each species which are useful for the description of varieties and for distinguishing between them.

Levels of expression or degrees of prominence shown or likely to be shown are laid down for each of the various characteristics.

For each characteristic it is necessary to determine and define the most suitable circumstances or time for carrying out observations and determining the level of expression of the characteristic in each specific variety.

Growing conditions, observation methods or laboratory techniques, depending on the circumstances in which the trial, test or analysis has to be carried out, likewise have to be decided upon and standardized as far as possible.

This work of variety description and identification makes use of those morphological, physiological, cytological, chemical, biochemical, agronomic and other characteristics that are suitable for the definition (description) and subsequent differentiation of varieties. The usefulness of characteristics is bound to be contingent on their reliability and their possible taxonomic value. That value is shown in consistency of expression in all circumstances, growing conditions or climates. There is generally a degree of fluctuation in the expression of all characteristics, higher in some than in others. A low or limited degree of fluctuation of a characteristic affords an indication of its usefulness and reliability.

A narrow range of fluctuation makes for ease of observation.

According to this method, individuals of the variety (plants or organs) are observed, and the level of expression of each characteristic in the list is noted. In the end we thus have a description of the variety.

By comparing the descriptions obtained for varieties of the same species with the previously determined criteria of class-breadth or minimum distance between varieties in respect of each characteristic, we can confirm whether or not the varieties are sufficiently different or distinct from each other.

By confirming, after having carried out the appropriate observations, that all the individuals constituting the variety or the sample under examination match the description, we confirm the uniformity or homogeneity of the variety. The presence of any off-types is acceptable within set limits, depending on the species or type of variety concerned.

By observing samples of the variety corresponding to successive generations and confirming that the levels of expression of the various characteristics are the same, in other words that the description made at each succeeding generation remains unchanged, we have confirmed the stability of the variety under examination.

In practice, as far as the stability of varieties is concerned, it should be mentioned that it is not normally possible with most species, in the two or three years necessary for or taken by the preliminary examination or DUS test, to conduct a trial in which samples from several successive generations are studied and compared. In order to overcome this difficulty, a variety is generally considered stable when a sample has proved homogeneous. If in such cases it is found, after the grant of rights to the breeder of the variety, that the material is not stable after all, the authority responsible could revoke the grant of rights.

UPOV Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties of Plants

These documents, drawn up by UPOV, with the participation of variety identification experts from member States, as we mentioned before, are a set of documents which, each for a given species or genus, describe and explain the exact method for describing varieties and for determining the presence of distinguishing characteristics of the variety, its homogeneity and its stability.

For the handling and application of the Guidelines it is necessary to take into account, use and refer to another document issued by UPOV and likewise

mentioned above, namely the "Revised General Introduction to the Test Guidelines," which is a broad presentation of the system elaborated on and specified for each genus or species in the actual UPOV Guidelines that we are describing here.

Layout and Arrangement of the UPOV Test Guidelines

At present, these documents are presented in three-language (English, French, German) versions. In view of the fact that the 1991 revised version of the UPOV Convention has included Spanish as an official language of the Union, the Guidelines may be expected to appear shortly in Spanish also.

The main headings into which these documents are divided are the following:

1 - Subject of the Guidelines

2 - Material Required

3 - Conduct of Tests

4 - Methods and Observations

5 - Grouping of Varieties

6 - Table of Characteristics

7 - Explanations on the Table of Characteristics

8 - Literature

9 - Technical Questionnaire

The information or guidance given under each of these headings may be summarized as follows:

1.- Subject of the Guidelines: The species or genus concerned by the principles set forth later in the document is named here.

2.- Material Required: In order that the trial sowings or plantations necessary for the observations, measurements and tests to be carried out may be made, plant material corresponding to the variety under test has to be received from the breeder. This consists of seed, tubers, plants, cuttings, grafting material, seedlings, etc.

This heading gives the quantities and type of material recommended by UPOV so that the authorities appointed to carry out the trials may instruct the breeder accordingly.

It mentions whether the material should be supplied in one consignment or yearly for as long as the trial lasts. Recommendations are moreover given on the quality characteristics of the material, its purity, germination, health aspects, moisture content, etc.

3.- Conduct of Tests: This important heading specifies the type of test (field test, glasshouse test, etc.); the recommended sowing pattern or patterns (spaced plants, row plots, broadcast plots, etc.); the number of replications; the number of test sites; the number of years or growing cycles; and the minimum number of plants or parts of plants to be made available for observations.

4.- Methods and Observations: Here the rules are given for the making of the observations, measurements and tests or assessments.

The numbers of plants, organs or plant parts on which, as a minimum, the observations have to be made are also given.

5.- Grouping of Varieties: With a view to facilitating and better organizing the work, especially that on the distinctness of the variety under test, this heading gives the recommendations for the grouping of similar varieties in the test. It suggests dividing the reference collection for the particular species, consisting of the known varieties with which the variety under test is to be compared in order to determine differences in relation to them. To make the division, it recommends using a series of characteristics that have proved their usefulness in this connection, and whose expression is in addition known to be little influenced by environment; they vary only slightly or not at all.

6.- Table of Characteristics: In order to determine the distinctness, homogeneity and stability of the varieties of every species or genus covered by each set of Guidelines, this heading presents, in the form of a table, the various characteristics that are considered appropriate by UPOV. For each the possible levels or states of expression are given, and coded from 1 to 9 for ease of computer processing or manipulation. Example varieties are given to define each level of expression better.

7.- Explanations on the Table of Characteristics: Where it is considered necessary, an indication is given under this heading of the explanations that could facilitate the understanding and use of the characteristics, and also drawings to illustrate the levels of expression of certain characteristics. When a given characteristic requires for its observation the conduct of some special trial, laboratory test, analytical assessment or resistance test, this heading gives a detailed description of the method, equipment and procedure involved.

8.- Literature: Specialized bibliographic references relating to the species referred to in the Guidelines are included under this heading. Generally they are designed to afford information on genetics, morphology, pathology, etc.

9.- Technical Questionnaire: This last part of the Guidelines gives a recommendation on the contents of the "Technical Questionnaire," to be completed by the applicant for breeders' rights and forwarded to the authority responsible for the conduct of the preliminary examination. It contains the following subdivisions:

1.- Species.

2.- Name and address of applicant.

3.- Proposed denomination or breeder's reference.

4.- Information on the origin of the variety.

4.1 Method of maintenance of the variety.

5.- Characteristics of the variety: Levels of expression of certain selected characteristics of the variety are given here. The purpose of the information is to facilitate the classification of the variety, by including it in a group of more or less similar varieties, and also to facilitate as much as possible the work of description of the variety and distinctness testing.

6.- Similar varieties and differences from those varieties: Here the breeder is expected to specify the known variety or varieties that are similar to the one for which protection is sought.

The denominations of the similar varieties and the differences from them should also be mentioned.

7.- Additional information which may help to distinguish the variety.

7.1 Resistance to pests and diseases.

7.2 Special conditions for the examination of the variety.

Definition and Observation of Characteristics

The characteristics given in the Guidelines corresponding to each species are those that UPOV has considered important for distinguishing varieties of that species, and also for testing stability and homogeneity. They have to be susceptible of recognition and precise description.

The Guidelines are a recommendation to the authorities of the member States of the Union. An asterisk is used in Guidelines to identify those characteristics whose use is mandatory in DUS testing, and which therefore also have to figure in the descriptions of protected varieties. Additional characteristics not appearing in the Guidelines may be used for a given species if this is considered necessary and important.

- Qualitative Characteristics: These are the ones that have different and discontinuous states or levels of expression. Some characteristics that are not strictly speaking qualitative but have sufficiently distinct or separate states or levels of expression may be treated as qualitative.

- Quantitative Characteristics: These can be measured and are continuously variable. Nevertheless, for the purposes of description, they are divided into various levels or states of expression.

- Observation of Characteristics: For the data obtained from the observation to be comparable, there should be harmonization and enforcement of the conditions and characteristics of the trials or tests to be undergone by the varieties to be tested, and also of the methods for the making of the observations.

  Quantitative characteristics are observed by measurement, and qualitative usually by visual inspection.

  Characteristics may be influenced by the environment in which the trials take place, which may cause changes in the expression of a characteristic.

- Use of Statistical Methods: To test the distinctness, homogeneity and stability of varieties in many cases, and especially with many types of species, use has to be made and actually is made of statistical methods for the testing of certain characteristics.

- New Technology and Methods: In principle, almost exclusively phenotypical characteristics used to be resorted to for description and for the testing of distinctness, homogeneity and stability.

In the course of time, however, technology and procedures have been evolving that have broadened the range of characteristics available for use by variety identifiers. Caryological study techniques, methods of chemical and biochemical analysis, the study of resistance to disease and pathogens, etc. have been gradually incorporated in the course of the drafting or revision of UPOV Guidelines.

At present there are many recently developed techniques available that are undergoing evaluation by the experts prior to acceptance. Many of them are bringing us close to the genotype of the variety, and should eventually make it possible to detect genotypical differences.

Testing of Distinctness

The various versions of the UPOV Convention require confirmation of the distinctness of a variety before rights are granted to its breeder. In order to test distinctness, the candidate variety under test is compared with all the varieties constituting the reference collection, itself made up of all the varieties previously known.

Two varieties are considered distinct if the difference between them is sufficient and if that difference has been recognized on at least one testing site, is clear and is consistent.

When distinctness has to be determined on the basis of qualitative characteristics, the difference between two varieties is clear if there are two different states of expression of the characteristics.

In the case of quantitative characteristics being used, it is considered that there is a clear difference if it shows up with a 1% probability of error, with the LSD method for instance. These criteria are revised when necessary, so that the most suitable and adequate may always be used.

Testing of Homogeneity

The texts of the UPOV Convention provide that a variety has to be homogeneous, having regard to the particular features of its sexual reproduction or vegetative propagation. The range of variation in a variety has to be limited for it to be accurately described and evaluated and for stability to be ensured.

The number of atypical plants or off-types, which are those where the expression of any characteristic or characteristics differs from the expression in the variety itself, must not exceed the tolerances specified in the revised General Introduction to the Test Guidelines, which we mentioned earlier. The tolerances will vary according to whether the varieties concerned are vegetatively propagated varieties, strictly self-pollinating varieties, mainly self-pollinating varieties, cross-fertilized varieties, synthetic varieties or hybrids (simple or multiple).

Testing of Stability

It has already been mentioned before that the principle generally applied is the widely accepted one which consists in a variety being considered also stable if it is tested and found to be homogeneous.

In cases where a specific stability test is required, material from various successive generations of the variety has to be compared in a test, to confirm whether or not it remains at all times true to its description.

FINAL CONSIDERATIONS

The result of the DUS testing work required by UPOV, in addition to confirming the distinctness, homogeneity and stability of a variety, provides us with a description.

The information thus obtained, apart from being necessary for the grant of breeders' rights, is usable and necessary for work associated with the inclusion or registration of a variety in a national or regional catalogue or list of varieties. If the provisions governing the procedure for entry in these catalogues so require, the DUS test would have to be supplemented with a study of the adaptability or agronomic value of the varieties, the latter requirement being outside the scope of UPOV.

In the work associated with the control of production and certification of seed and nursery plants, if it is to be done properly, there have to be exact descriptions of the varieties involved, to enable inspectors in the field to carry out their work efficiently.

Some certification systems, like that of the OECD, require the making of pre-control and post-control tests as a method of confirming and assessing the trueness to variety of the material produced. For these tests to be carried out properly, there have to be descriptions of the varieties.

We can see from the above that the results of the DUS tests have a number of uses, not confined to the mere grant of protection to the breeder.

Through its specialized bodies, the Technical Committee and its Technical Working Parties, UPOV has worked out a method of variety characterization for the majority of species of interest to its member States (about 140 species at present).

This work is being done by experts from the member States of the Union and staff of the UPOV Office. They are often joined by experts from the private sector or sent by observer States not yet members of UPOV.

Participation in this work is a very good way of learning about the methodology of the UPOV system, and about the details of its implementation. At the same time it undoubtedly affords a unique opportunity of making the acquaintance of the experts, testing centers and installations of the various States, in view of the fact that the Technical Working Parties hold their meetings in the form of visits to the protection office of a selected country. This system has proved a very useful means of promoting the exchange of experience and knowledge among the participating technical experts.

The UPOV Office is able to provide all general information on the DUS testing system that the Union has perfected, and also on the various Guidelines that have been drawn up.

THE UPOV APPROACH TO THE EXAMINATION OF APPLICATIONS FOR PROTECTION - PAST, PRESENT AND FUTURE

It can prove costly for a country to possess a fully operational system for the protection of new varieties of plants if it does not take the necessary avoiding action. Conversely, if all the means available to us are used, and the basic principle is adopted of relying on international cooperation, an example of which could be that practised within UPOV, there is every likelihood that the cost of implementing a legal system for the protection of new plant varieties can be minimal and indeed, depending on the fee systems operating in a particular country, practically non-existent.

For a system to be efficient and to operate to the advantage of breeders, there has to be a legal framework that is streamlined and suited to the needs of the country, an office responsible for the grant and maintenance of breeders' rights and a network of technical and material facilities available to it. Obviously legislation does not present a cost problem. Any country is in a position to enact legislation, which requires no more than the declared intention to introduce plant breeders' rights. Nowadays there are many laws that can be used as models on which to base legislation, in addition to the Model Law published by UPOV for countries that have no experience in this field. What legislators do have to take into account as a matter of some importance is the notion of simplicity and smoothness in the design and implementation of the legislation, the necessary provision to ensure that the costs deriving from that implementation are minimal, and of course the possibility of clear regulation of international cooperation in whatever areas this is appropriate.

As mentioned earlier, it is necessary to have an office for the protection of new plant varieties. It is here that one might expect costs to start emerging that could make protection more costly. In my personal opinion this should not present problems either, provided that it is properly planned, that advantage is taken of the experience of other countries with long traditions of plant breeders' rights and that, as already mentioned, advantage is taken of international cooperation. A government office or institution can be set up to deal with these concerns and given whatever breadth of responsibility may be desired, ranging from responsibility for all the work generated by variety protection--reception and processing of applications, organization and conduct of identification (DUS) trials, maintenance of reference collections, maintenance of variety preservation centers, grant of protection, analysis of resources, etc.--to a competence which consists merely in adequate facilities for the technical and administrative aspects of protection. Between those two extremes there are a number of examples to be found in various countries. Once again it is worth repeating that in many of the areas just mentioned international cooperation can make it possible for the offices concerned to have uncomplicated and hence low-cost responsibilities. I am not referring only to newly-created offices in countries where protection systems have just been introduced, but also to those already existing which undoubtedly will evolve along the lines that I have just described.

I wish to place special emphasis on the third of the aspects mentioned, namely technical and material facilities, and especially on the question of the processing of varieties from the point of view of definition and comparison with others, which is unquestionably the most costly part of the system. The conduct of the so-called prior examination, involving assessment of

distinctness, homogeneity, stability and novelty, in principle requires the availability of plots suitable for the growing of the species to which the breeders' rights system applies, and also experts on the species in question who possess sufficient knowledge to be able to take their share of responsibility for the future grant or denial of property rights. There are many countries which, when it comes to considering the possibility of introducing protection systems for new plant varieties, have abandoned the idea on account of the difficulties of having at their disposal all the necessary means of conducting variety examinations. Apart from that, countries with operating protection systems have not been able to apply them to more than a small number of species owing to the same apprehensions. So I should make it clear once again that cooperation between countries, at either bilateral or multilateral level, goes a long way towards avoiding the problems mentioned and can bring the costs associated with protection down to negligible amounts.

It is well known that there are certain countries, a striking example being the United States of America, in which no prior testing of varieties is conducted by the registration authorities, it being sufficient for the breeder to submit the results of trials conducted previously on the basis of the UPOV "Technical Guidelines," a system permitted by the present text of the Convention establishing the Union. Most of the remaining countries of UPOV do however conduct such trials, and indeed an extreme can be reached where for certain species prior examination is done on the same varieties in each country, which unquestionably constitutes a duplication of variety examinations and increases costs, not only for the authorities responsible but also for the breeders themselves. Before UPOV was created, many countries used their own technical methods of conducting variety examinations, which differed not only with respect to philosophy but also with respect to details of technical character. Particularly with species that had been protected for the longest time, like cereals or legumes, for which there was a long tradition of prior examination, the differences in the methods used and in the analysis of findings were considerable. There was no clear picture of the procedure that had to be followed. This caused great confusion among the breeders of new varieties, who in many cases were applying to different countries for their protection, and consequently came up against different sets of problems in each country for the same variety. It was therefore seen to be necessary to harmonize prior examination procedures, a task that was taken on by UPOV, as we shall see later, and which, apart from serving as the technical basis for the uniform testing of varieties in the various countries, is an element of the utmost importance in international cooperation and ultimately in reducing the cost of conducting such work, as those countries having difficulty in assembling the material resources and experts for the various species that they wish to protect can approach others, more experienced than themselves, for the conduct of the prior examination or for the provision of examination results if the variety is already protected there; this will undoubtedly represent a substantial saving compared with the methods that I described earlier.

Having said all this, I now intend to alert you to an error that is frequently committed when the difficulty of implementing a plant variety protection system is considered. Cooperation between countries makes it perfectly possible for countries with more limited economic resources than others to cater for the rights of breeders with the same effectiveness.

I shall confine myself at this stage of my talk to commenting on how the International Union for the Protection of New Varieties of Plants promotes this form of cooperation, and how, acting on the principle that governs the purposes of the Union, that of ensuring the proper implementation of the Convention text

in force and endeavoring to bring harmony to the action of the various member States, it has been conducting its operations up to now and will continue to do so in the years to come.

ORGANS OF UPOV

In addition to the permanent organs of the Union, namely the Council and the Office or Secretariat-General, which are responsible respectively for taking all the decisions necessary for the proper operation of UPOV and implementing them, the Consultative Committee and the Administrative and Legal Committee, there is also the Technical Committee, whose functions and work on technical aspects are of enormous importance and assistance to the various member States of the Union.

The work of this Committee is conducted through Technical Working Parties, which at present go by the names of: Ornamental Plants and Forest Trees, Fruit Crops, Vegetables, Agricultural Crops, and Automation and Computer Programs. The Working Parties are composed of government experts from each of the member States of the Union and other interested States. Their most important function consists in the development of the Test Guidelines for the various species, which deal with the testing of the various varieties for distinctness, homogeneity and stability. Each has the opportunity of keeping abreast of the latest variety examination technology, and they are an important reference for experts from countries starting out along the path of plant variety protection. The annual meetings of these Working Parties, and the fact that their meetings are always held at different locations, make it possible for the experts attending them to entertain close relations between themselves, to learn how each country conducts its work on the study of varieties, to acquaint themselves with the most advanced technology in this area and also, if the experts in question are from countries recently accepted into the Union, to benefit from a rapid introduction to the knowledge necessary for the technical analysis of varieties. I should like to place special emphasis on the advantages of these Working Parties for countries that have recently acceded to UPOV, in view of my own experience of what happened in my country as a result of our participation in the Working Party meetings. In a very short time we managed to bring ourselves up to date on matters of identification, which enabled us to progress rapidly in all the technical aspects of the operation of the Varieties Registry, and I can claim without fear of contradiction that with respect to many species we are now at the same technical level as countries recognized as authorities in such work.

COOPERATION AND HARMONIZATION IN THE TESTING OF VARIETIES

The UPOV Convention clearly provides that the protection of a particular variety can only be granted when examination of the variety shows that it complies with all the requirements that qualify it for protection, in particular that it is distinct from any variety whose existence is a matter of common knowledge, and that it is sufficiently homogeneous and stable. As I mentioned before, this examination is based in the majority of the member States on field trials conducted by the service or office competent in matters of protection or by independent bodies, such as official research institutes, universities or other centers that act on behalf of the service or office in question.

From the start of its activities, UPOV has endeavored to ensure that this preliminary examination is as uniform as possible when it is conducted in member States. It has made every effort to prevent the use of different standards or procedures in the various States. To that end, and as a result of the work of the Technical Committee, the so-called "Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability" have been adopted. This was one of the first tasks undertaken by UPOV through the Working Parties of the Technical Committee; it was started in 1970 and is continuing with a view to laying down such Guidelines for new species and keeping those drawn up earlier constantly up to date on the basis of the wideranging experience of the experts who have spent years working on the various species.

The Guidelines start with certain recommendations addressed to national offices, referring to subjects such as the quantity and quality of plant material to be submitted by the applicant for variety protection, the phytosanitary requirements to be met by the material, the conditions under which both field and laboratory trials have to be undertaken with respect to plot size, replications, number of plants per replication, duration of trials and recommended variety groupings. Apart from that the Guidelines contain information on the part of the plant on which a particular characteristic is to be observed, the time at which the observation should be made and the way of making it. Also included are the "characteristics," namely the features that have to be examined in connection with the description of the variety in such a way that each can be given a score according to a range of possible levels or different expressions of characteristics, which sometimes are illustrated with drawings for case of observation.

All the Guidelines are drawn up on the basis of a set of general standards called "General Introduction to the Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties of Plants." To date 131 have been adopted, including the main agricultural, vegetable, fruit, ornamental and forest species. A further nine are on the point of being adopted, and about 40 are under consideration by the Working Parties.

In the course of the preparatory work on the drafting of these documents, in addition to the official experts from member States, the right to participate is given to private breeders and international organizations representing the profession, and also to acknowledge specialists on the various genera and species, which guarantees that broadly acceptable results will be achieved. Proof of that is the fact that the Guidelines, apart from being used by the offices of UPOV member countries, are used as a reference for the work of commercial variety registers, for the carrying out of internal post-control tests under systems of seed and nursery plant certification and control, and are extensively taken into consideration in the work of international organizations like the OECD and the European Economic Community.

The importance of the Guidelines to international cooperation between countries is clear from what I have just said. No member State should have to invest considerable amounts of work or money separately or independently for the conduct of tests on varieties for which they receive applications for protection. It should not therefore be necessary that they provide themselves at great expense with the independent administrative and technical facilities that would be required for the examination of varieties of every protected species. Such a system would be uneconomical above all for those species that give rise to only a small number of applications annually. As already mentioned, the relatively high cost of preliminary examination and the work that has to be done have proved to be one of the obstacles that stand in the way of States affording more extensive protection to new species.

The Guidelines, as a standard work reference, allow all the member States to acquaint themselves with the way in which the others carry out their tests. This in turn has made it possible for the majority of UPOV members to observe the recommendations regarding cooperation and to work with and for each other. For instance, for the species sunflower and pear, France does the testing for other States, while apple and Chrysanthemum are tested in the United Kingdom, carnation in the Netherlands, rye and Pelargonium in Germany, etc. Spain is completing an agreement with Germany under which the latter country is to make a series of variety studies on grasses, and Portugal will be entrusting tests on strawberry to Spain. All of this, which is taking place under bilateral agreements, is a considerable step forward, although in fact the future of this cooperation should be based on so-called centralized examination, whereby one country takes charge of a set of species on behalf of the others under multilateral agreements, choosing those species for which it is technically able to undertake the task. The latter approach will bring about not only almost total harmonization in the carrying out of preliminary examination, but also a great reduction in costs for breeders who wish to have their varieties protected in two or more countries, as they will have only very modest fees to pay if the testing has already been done in a country that protected the variety in the first place. When many of the countries here present eventually accede to UPOV, the system will be sufficiently well developed, and I am sure that they will see that the costs involved in this work are extremely low.

COOPERATION AND HARMONIZATION IN ADMINISTRATIVE PROCEDURES

I am now going to deal briefly with the work that UPOV has been carrying on with a view to having practical measures adopted that will facilitate the work of breeders and also open up channels of cooperation between the various member States. Independently of the Guidelines and their widespread introduction for the purposes of the conduct of tests, there are Technical Questionnaires, various types of forms necessary for administrative processing, standards for the charging of fees and for variety denominations, models for technical information exchange between member States, and a Model Law on plant variety protection which can be used for reference by countries that decide to introduce rights of this type within the framework allowed by the 1961 Paris Convention and revised versions of it, up to the Geneva Act of 1978.

Technical Questionnaires

These technical forms are for the benefit of breeders. They contain references to the origin, maintenance and manner of reproduction or propagation of varieties which have to be provided by the breeders. They also include technical characteristics selected from among those appearing in the Guidelines, the knowledge of which is considered very useful to authorities concerned with preliminary examination for the grouping of varieties that is necessary to facilitate the trials. The applicant has to complete the questionnaires with information on the variety characteristics which, in his opinion, distinguish his variety from others most closely resembling it. Ultimately they are a very important reference for the conduct of the preliminary examination and for information exchange between countries.

Model Application Form for Plant Breeders' Rights

This model is widely used in the majority of member States. It contains the information of general character that is requested of the person filing the application; the information is numbered according to the various data requested, which facilitates communications between countries where the breeder applies to more than one for protection. It contains sections referring to the name of the breeder or his successor in title if any, legal representatives empowered to act in his name, the species, the variety together with its denomination, countries in which applications have already been filed or the variety has already been granted protection, the position regarding lists or catalogues of varieties, etc.

Model Application Form for a Variety Denomination

In the same way as the above form, this form is a model that is numbered to identify its various sections, which in addition to the particulars concerning the breeder or his representatives give the denomination submitted for the variety, other denominations for the same variety existing in other countries, the possible existence, and if so the renunciation, of other rights in the denomination, and other details. Every variety naturally needs a denomination as if it were a more inherent characteristic of the variety, and the denomination has to be known to all countries that protect varieties, with a view to achieving the desired harmonization and avoiding the risk of conflict occurring in the case of plagiarism or copying.

Model Administrative Agreement for International Cooperation in Testing

As already mentioned, international cooperation in the preliminary examination of varieties takes place under bilateral agreements concluded between the competent offices of member States. In order to give those agreements the necessary uniformity, UPOV adopted in 1984 a Model Agreement for the exchange of information when a country has to undertake tests on behalf of another one in which protection of the variety has been applied for.

Model Technical Examination Report

The Model Administrative Agreement is complemented by another one in which, when the office of one member State entrusts that of another with the examination of a variety, it receives the corresponding report from the other State and, where the variety in question meets the criteria of distinctness, homogeneity and stability, it also receives the description of the variety, whereupon the requesting State has full information on the variety at its disposal and can take whatever decision it considers appropriate regarding its protection. These models, which promote and facilitate the conclusion of bilateral agreements, will be an important basis for the future multilateral agreements that will be concluded to govern relations between UPOV member States.

Model Plant Breeders' Rights Gazette

Under the International Convention for the Protection of New Varieties of Plants, member States are bound to publish, through their competent author-

ities, an official gazette by means of which breeders may receive information and keep abreast of any news that has a bearing on the field of plant breeders' rights. For instance, they have to know about applications for protection filed in the various countries, requests for denominations, the withdrawal of applications for whatever reason, the grant or refusal of protection, and information on exploitation licenses, in addition to any other news that may be considered of interest. All this information allows breeders and other interested parties to inform themselves of what is going on in this sector, and also to intervene personally in matters in which they consider themselves interested parties. UPOV has drawn up a model for such gazettes, the broad outline of which is followed in all countries and which serves to remove any obstacles of a linguistic nature, apart from which it achieves a very substantial degree of harmonization of all informational material in this subject area.

Model Law on Plant Variety Protection

As already mentioned on other occasions, with a view to easing the task of States that wish to introduce a system of plant breeders' rights conforming to the UPOV Convention, the Union has published a Model Law on Plant Variety Protection. It should be said, however, that this is not a very useful document at present, owing to the amendments that have been made to the original 1961 Convention, the first of which were made in 1972 and the more important ones in 1978 and 1991, and which probably will necessitate the drafting of a new Model Law that accommodates the new characteristics and will therefore be useful for future reference.

Recommendations on Variety Denominations

The UPOV Convention now in force, and also the one that will enter into force as a result of the revision effected at the Diplomatic Conference held in March of this year, not to mention the laws of the various member States, contain regulatory provisions concerning the denominations that may be given to varieties submitted for protection. So the Union, through its Technical Working Parties, has drawn up certain recommendations to be observed by member States with a view to achieving the greatest possible uniformity in the implementation of the Convention's provisions. Language differences, the weight of tradition in individual States regarding the assignment of denominations and the awkward implications of those denominations possibly embodying other industrial property rights such as trademark rights, lend great importance to the recommendations drawn up by UPOV in this area. Their application likewise contributes importantly to promoting cooperation between the various member States of the Union.

Recommendation on Fees

In this exposé I want to shed some light on matters concerning the fees charged by the various countries in exchange for the services that they render in connection with protection, which is without any doubt one of the more pressing problems that UPOV has to solve, and whose solution raises a considerable number of difficulties.

Every member State has its own established system, sufficiently similar to the next regarding the type of services charged for, but different with respect to the amounts charged. In some the breeder is charged the full cost

of the services rendered, and in others the State budget shares the cost to a greater or lesser extent. This makes it very difficult to contemplate harmonization in the area concerned, which, while it does not present serious problems in the breeder's relations with the actual country in which he applies for protection, does however create problems when he applies to another State, and above all when the bilateral or multilateral agreements that I have mentioned occasionally are involved. Countries with very different levels of fees encounter difficulties when it comes to concluding such agreements, and as a result any attempt to make a UPOV-level recommendation is fraught with difficulty.

I should however qualify the foregoing by saying that UPOV has laid down, in the form of recommendations, certain fee rates for cases where countries take charge of preliminary examination for each other, or where information is given on the findings of the examination if it has already been carried out. It is, I repeat, a subject of the utmost importance, one that has not been settled to date and one for which the various member States are trying to find solutions at the bilateral level.

Other Documents

In addition to all the models and documents that I have just mentioned, UPOV publishes a quarterly Newsletter which provides information on everything going on in member States. The Newsletter also gives news of the extension of protection to new species, changes to the fees charged in each country, legislative reforms and also some of the more significant events in countries not members of the Union. Other standard documents have also been issued which we have not commented on above and which serve as recommendations for the action of member States and their mutual relations on protection matters.

CONCLUSIONS

The first of the conclusions that I wish to draw from everything I have said above relates to the extremely important role that UPOV is playing and will continue to play in the relations between countries with a legal framework for the protection of new varieties of plants. For one thing there is the obligation that it places on its member countries to align their legislation and comply with the provisions of the current Convention, and then its constantly pursued aim of harmonizing, as much as ever possible, the action of each country in matters of plant breeders' rights, and its permanent encouragement of member States to work together in the various areas of protection; all these are the attributes of a modern, constantly developing organization seeking to improve the available means of serving the objectives that it has set itself, and one concerned with integration in its desire to broaden its membership and ease the work of plant breeders over the widest possible territorial area.

The benefits resulting from what I have just described are not only the invaluable cooperation that now takes place between countries, but also the good relations that develop between experts from those countries. The fact of being acquainted, whether on account of the large number of meetings that are held or through permanent contact by correspondence, means that all of them are up to date on the latest techniques for the identification or study of varieties. Specialists on particular crops readily pass on their knowledge to

those who are not, enabling them to acquire a high level of experience in a short time. Without such cooperation, there would be long delays in the accumulation of the requisite knowledge in any related field. One thing that is still capable of lessening the effectiveness of what I have described is the language problem, above all that prevailing in the countries of this Latin American area, but this difficulty has now been removed, as you probably all know, by the adoption of Spanish as an official UPOV language in the 1991 Act of the Convention.

I have also dealt at length on matters concerning the conduct of preliminary examination on varieties filed for protection. The conclusion to be drawn here is that a high level of international cooperation has been achieved in this aspect of the protection system. Taking the example to an extreme, it would be perfectly possible for a country to require the conduct of the preliminary tests before granting protection to a new variety, and yet not having the adequate means of carrying out the test, but that would not be an obstacle to the grant of protection, as action could be readily taken on the basis of the bilateral and multilateral agreements that I have mentioned. Some may think that even this system has certain operating costs, which is indeed true, but they are invariably lower than if it were necessary to possess all the means of doing the work unilaterally. Nevertheless, it has to be borne in mind that the costs are passed on to the breeders, who are those who derive direct benefit from the system, and in my experience there is seldom any opposition from that quarter. Consequently the public sector expenditure incurred in this area of activity is substantially smaller than generally imagined.

On the other hand, the work done by UPOV through its Technical Committee and Working Parties is a vital component of other activities concerned with seeds and varieties that are going on in the various countries. The composition of lists of commercial varieties or variety catalogues is being based more and more on documents issuing from UPOV, at least as far as the technical work is concerned. Catalogues require varieties to be identified, and the Technical Questionnaires and Guidelines for the various species have been successfully used in many countries. The same sort of thing is happening with the development of certification and control systems for vegetative propagating material, which are being based more and more on so-called pre-control and post-control trials or tests, the conduct of which is aligned on the forms described earlier. I have already mentioned that organizations like the OECD and the EEC, which have responsibilities in connection with certification matters in their efforts to harmonize the systems operated by their countries, recommend the use of UPOV documents or actually base their own work on them.

I do not wish to end this talk without stressing the importance of plant variety protection to seed and nursery plant production. The present trend is for the increasing production and use of varieties enjoying protection. This is conducive to control systems becoming increasingly efficient, as it is the breeders themselves who, for the sake of their rights, are concerning themselves more with the proper conduct of such controls, which in turn makes for a substantial lessening of clandestine production and of course an improvement in the eventual quality of the product obtained from the varieties.

I should like to end this exposé where I started it. Some of the countries represented here have a legal framework for plant breeders' rights, even though they are not yet members of UPOV. To them I have to say most emphatically that it is a very good thing to join the Union. Working alone in this area is a very complex business: one soon becomes out of step, out of touch with the progress that is taking place all the time. The cooperation that

I have repeatedly advocated greatly facilitates all the work that has to be done. There are other countries in the Latin American region that either do not have any established protection system or, at best, mention the possibility of including appropriate provisions in legislation of a general character, but have never done so. My advice to them is that they should set about enacting those provisions. This will benefit not only the breeders, both national and foreign, but also the very productivity of national agriculture, and unquestionably also the eventual users, who are no less than the farmers themselves. Without going into the political reasons for the desirability of adopting or not adopting such systems, I see their implementation as being perfectly feasible and, as I have been saying from the outset, without serious cost implications as far as the maintenance of the systems is concerned. Cooperation between countries of the Union, the assistance and support constantly provided by UPOV in that connection and the extension of protection to the greatest possible number of species make it perfectly likely that, when you embark on this new activity, it will not cause the economies of your countries the slightest financial or budgetary problem.

S E C O N D S E S S I O N

THE INTERFACE BETWEEN PLANT BREEDERS' RIGHTS AND OTHER FORMS OF INTELLECTUAL PROPERTY PROTECTION AND THE FUTURE

Speaker: Mr. Barry Greengrass, Vice Secretary-General, UPOV

THE EXPERIENCE OF A MEMBER STATE OF UPOV

Speaker: Mr. Bill Whitmore, Commissioner of Plant Variety Rights, New Zealand

REPORTS FROM REPRESENTATIVES OF THE COUNTRIES OF THE REGION AND DEBATE

Chairman: Mr. Ricardo López de Haro y Wood, Technical Director of Seed Certification and the Register of Varieties, National Institute of Seeds and Nursery Plants, Spain

THE INTERFACE BETWEEN PLANT BREEDERS' RIGHTS AND OTHER FORMS OF INTELLECTUAL PROPERTY PROTECTION AND THE FUTURE

I have the task of describing and discussing very briefly the interface between patent protection and plant variety protection and the future. In order to do this I will remind you very briefly of some of the principle features of these two forms of protection and of the historical background to their relationship. Patents are granted for the protection of inventions. In order that a patent may be granted for an invention it must:

(i) be industrially applicable (industry for this purpose includes agriculture),

(ii) be novel,

(iii) be the subject of an enabling disclosure (this means that it must be so described in the patent application that a person skilled in the art to which the patent application relates can, by following the description of the invention, reproduce or repeat the invention), and

(iv) represent an inventive step in relation to the existing state of the art (this means that the invention disclosed in the patent application should not constitute an obvious step forward from the existing known technology to a person with average skill completely informed about the technology which is in the public domain at the date of the application).

Once a patent is granted its effect is to enable the patentee to exclude others from working the invention, this is to say, from performing acts such as making, using or selling a product or applying a process which falls within the claims of the patent. The claims in effect define the protection sought by the patentee.

In many countries plant varieties were considered not to fulfill one or other of the criteria mentioned above and thus to be ineligible for patent protection. In some countries, patents were occasionally granted that included plant varieties within their scope of protection, but the practice was controversial and the validity of some such patents was in doubt. Amongst the reasons for doubt concerning the eligibility of plant varieties for patent protection were:

(i) the absence of an enabling disclosure (it was suggested that it was never possible to so describe the process of selection of a specific variety that a person skilled in the art could repeat the selection of the same variety);

(ii) that living material was not appropriate subject matter for the patent system or that exclusive rights should not be granted in relation to plant varieties constituting an essential step in the food production process;

(iii) that the process of selection of a plant variety addressed an obvious objective with known technology and did not represent an inventive step.

It was also suggested that since plant varieties are frequently capable of self replication, a patentee's rights would be exhausted after the first

sale and would not extend to subsequent replication, so that a patent was a questionable form of protection for a plant variety.

Objections to the patenting of plant varieties based upon their strategic role in agriculture and food supply remain very strong in many developing countries.

The precise position differed from country to country depending on its patent law and on its patent practice and jurisprudence. For present purposes it suffices to say that, in the years prior to 1960, the likelihood of securing effective patent protection for a plant variety was not generally considered to be sufficient to provide an effective incentive for investment in plant breeding.

The International Convention for the Protection of New Varieties of Plants of 1961 (the "UPOV Convention") resulted from pressure from interested circles arising from this perceived lack of effective protection for plant varieties and the desire of governments to provide effective incentives for the socially beneficial activity of plant breeding. However, the protection provided for in the UPOV Convention was very specifically tailored to the needs of the agricultural and horticultural industries and to what were considered to be the needs of the community and its food supply. The first two paragraphs of the Preamble to the 1978 Act of the UPOV Convention read as follows:

> "Convinced of the importance attached to the protection of new varieties of plants not only for the development of agriculture in their territory but also for safeguarding the interests of breeders.
>
> "Conscious of the special problems arising from the recognition and protection of the right of the creator in this field and particularly of the limitations that the requirements of the public interest may impose on the free exercise of such a right."

Whilst under the patent system the available scope of protection is limited only by the valid claims of the granted patent, under the UPOV Convention the scope of protection is limited to the variety, the specific assemblage of plant material selected by the breeder which represents the variety, in relation to which the breeder is granted the specific rights specified in the Convention. Thus the breeder's right under the 1978 Act, with one exception relating to cut flowers, is the right to produce for the purposes of commercial marketing and to market the reproductive or vegetative propagating material of the variety. The breeder's right does not extend to the end product of the variety, for example to the fruit or the grain, and seed, for example, which is produced by a grower on his holding for use on that holding is not produced "for the purposes of commercial marketing" and thus falls outside the protection.

Protection of this specifically defined nature was deemed by the signatory States of the 1961 and 1978 Acts of the Convention to be appropriate in the circumstances of the plant breeding and agricultural industries. The Convention does provide for the possibility for countries, optionally, to increase the scope of protection even as far as the end product, but few countries have done so.

The interface between patent protection and protection under the UPOV Convention was addressed by Article 2(1) of the 1978 Act of the Convention which provides as follows:

> "Each member State of the Union may recognise the right of the breeder provided for in this Convention by the grant either of a special title of protection or of a patent. Nevertheless, a member State of the Union whose national law admits of protection under both these forms may provide only one of them for one and the same botanical genus or species".

The last sentence of Article 2(1) has been interpreted by the practice of UPOV member States to mean that patents should not be granted for species for which plant breeders' rights are available. Thus both France and the Federal Republic of Germany, which prior to the enactment of laws relating to plant breeders' rights did grant some patents relating to plant varieties, continued to be prepared to grant patents for species for which plant breeders' rights were available but ceased to grant patents for species protected by the new form of protection. This interpretation was also reflected in Article 53(b) of the European Patent Convention which excludes plant and animal varieties from protection by patent and in similar exclusions in the national laws of some forty-two States. Many countries in Latin America either expressly exclude plant varieties from patent protection or, even where there is no such express exclusion, do not in practice grant patents for plant varieties.

Over the same period, the 1950's and 1960's, as that within which the emerging plant breeders' rights system was developed, the patent system was contending with the problem arising from the necessity to protect micro-organisms, another form of living material, where similar difficulty in providing an enabling disclosure or description of the invention confronted the patent applicant. The patent system overcame this difficulty in relation to micro-organisms by the introduction of a system of deposit. The patent applicant must still describe his invention fully but insofar as the description is inadequate to enable a skilled person to repeat the invention, the inadequacy is remedied by a public deposit of the organism itself. The deposit and description together are deemed to constitute an enabling disclosure. The system of deposit thus potentially overcomes one of the historical problems that impeded the protection of living material, including plant varieties, by patent. An international treaty, the Budapest Treaty of April 28, 1977, on the International Recognition of the Deposit of Micro-organisms for the Purposes of Patent Procedure now regulates the mutual recognition of deposits by States which are party to the Treaty.

The next major development influencing the interface arose not within the system of industrial property protection but within the realm of the biological sciences. The discovery of the structure of the DNA molecule, the chemical substance that constitutes the nucleus of the cell and contain the vast majority of the genetic information which is the major basis for inheritance, opened up a vast new field for innovation and invention. The fact that the genetic code was common to all living matter meant that traditional distinctions between macro and micro-organism were of limited usefulness. Most importantly it has begun to be possible to describe living organism in terms of the chemical units which constitute their genotype instead of relying upon the less reliable attributes of the phenotype. Significant investments have been made and are being made in the new arts of molecular genetics and tissue culture. Questions accordingly arose concerning the form of industrial property protection available for inventions in the field of biotechnology. A vigorous international debate began which continues at the present time and has been reflected in the activities of both UPOV and the World Intellectual Property Organization ("WIPO").

So what were the issues that arose? Well, as far as plants were concerned, people involved in biotechnology looked at the forms of protection that were available for plants. If they were investing money in this field, the point at which they could finally earn a return was the commercialization of a plant variety and so they came to look at the UPOV Convention and frequently they would have been people with a patent background and accordingly they compared the UPOV Convention with the patent system. Of course they found significant differences. UPOV protection is limited to the reproductive material, it affords a farmer's privilege and it is limited to the variety. You cannot make claims so as to stake out a bigger area of monopoly for yourself. You cannot claim a characteristic. I think this is very important for plant breeders. If you have a variety which expresses a particular characteristic, you may own the variety but you do not own and cannot claim any exclusive right to the particular characteristic, even if it is a rather new characteristic. So they felt rather unhappy about what they saw. Much material has been published, there has been much debate on this subject. But, of course, insofar as the UPOV form of protection is more limited than patent protection, it is limited for very specific reasons. You will recall my reading the Preamble to the 1961 Act of the Convention where the fathers of the Convention, the people who were involved in that drafting and creative process, felt that it would be wrong to grant protection that went too far. It would be wrong for a farmer not to be able to produce a certain amount of his own seed on his own farm. This is a fundamental aspect of the interface. The fact is that the policy of the plant breeders' rights legislation is plainly different from the policy of the patent laws, but this was not an accident. It was a deliberate act of policy on the part of the countries that were involved. If there were to be changes then making the changes would equally have to be a political act of countries involving their agriculture/industry interface. Countries and their governments needed to address these questions and to decide whether or not there were particular aspects of the interface which they wished to change. The breeders' rights scope of protection was not intrinsically limited.

You have already learned in this Seminar that the Governments of member Stats did indeed decide to change the scope of protection under the UPOV Convention in the Diplomatic Conference held in March this year. The scope of protection for plant breeders is accordingly the first largely political aspect of the interface.

A second major aspect of the interface concerns the situation where the scope of a patent for a biotechnological invention is such that it embraces a protected plant variety. A simple example of this would be a patented gene which is incorporated into a protected plant variety. Perhaps the claims of the patent for the gene are such that it embraces, it covers, any plant variety that contains that gene.

It is very easy to talk about a patented gene and we tend to do it fairly frequently nowadays. Exactly what it means to patent a gene or what the scope of the claims for a gene will be, largely remains to be seen. Many scientists are of the opinion that discovering the existence of a gene that exists in nature and describing its genetic sequences is a scientific discovery and not a patentable invention. Yet others believe that identifying the genetic sequences of a known gene is a routine laboratory task not involving inventive genius and should not be patentable. It represents the result of "perspiration" rather than "inspiration"!!! However, I think most people in UPOV member States anticipate that the scope of patents covering some genes will be sufficiently broad to cover plants and perhaps plant varieties, but it is by no

means clear. It is a very, very grey area, but it is useful for us, in order to try and clarify our thinking, to talk about patented genes, although it is not really quite such a simple concept in practice.

Most plant breeders in UPOV member States, at this conceptual level, seem to be fairly happy with the notion of a patented gene. Such plant breeders are happy with the notion that if somebody has managed to patent an invention involving a gene and its claims cover his plant variety, he should not be free to exploit his plant variety without the permission of the patentee.

Another obvious example of interface, where the scope of a patent covers a plant variety, arises if a patent is granted which claims a plant or a plant variety. It is possible that the claims relating to one plant or one plant variety may be so broad that they cover a whole class of varieties. I can give you an example. A patent was granted for an invention concerning a variety with a high content of a particular oil constituent in sunflower and the patent claims sought an exclusive position for the patentee in relation to all varieties with this oil content. If that patent had retained its validity, then it would have been very difficult for anybody else to have bred sunflower varieties with that particular oil constituent. This is a further example of interface between the patent system and plant variety protection system.

Another problem area arises for the UPOV system when countries grant patents for inventions which constitute plant varieties. The patent applications and its variety description become part of the public record. You will recall that the criteria for granting patents are novelty, industrial applicability, an enabling disclosure and inventive step. The criteria for granting plant variety protection are commercial novelty, distinctness, uniformity and stability. If patents are granted for inventions that are in fact plant varieties, without the application of the UPOV criteria, then the existence of these varieties will not necessarily be known to the plant variety protection Offices. When decisions are made about distinctness, what account should be taken of patented plant varieties whose uniformity, stability or, distinctness, in UPOV terms, are unknown? This is a significant ongoing problem for the plant variety protection system.

The main contribution of UPOV to providing solutions to the interface question lies in the new 1991 Act of the UPOV Convention since the new Act of the Convention was elaborated in the light of the developments in biotechnology and of the interface debate.

This work of revising the 1978 Act of the UPOV Convention started in 1987 and culminated in the adoption by the Council of UPOV in October 1990 of a draft revised Convention ("the Basic Proposal") and in a decision by the Council to hold a Diplomatic Conference in March 1991 to revise the Convention.

In addition to the 20 member States of UPOV, some 30 observer States participated in the Conference, as well as 24 intergovernmental and non-governmental observer organizations. In excess of 130 proposals for amendments to the Basic Proposal were considered by the Conference which finally adopted unanimously on March 19, 1991, a revised 1991 Act of the UPOV Convention ("the 1991 Act"). Ten member States of UPOV signed the 1991 Act at the conclusion of the Conference and it remains open for signature by States which were members of UPOV at the date of its adoption, until March 31, 1992. The effect of signature is not, of course, to bind the signatory State but simply represents an acknowledgment of its intention to enact a law based on the Convention and, in due course, to ratify the Convention. It is only the ratification of the

Convention by an existing member State which has signed the Convention, or accession to the Convention by a new member State, which creates an international legal obligation. The remaining member States of UPOV are expected to sign the 1991 Act in the months ahead.

Article 37 of the 1991 Act provides that it will come into force one month after five States have deposited their instruments of adherence, provided that at least three of such instruments are deposited by existing member States of UPOV. After the entry into force of the 1991 Act, the 1978 Act will be closed to further accessions.

However, two "periods of grace" have been incorporated into the 1991 Act. The 1978 Act will remain open for accession by developing countries until December 31, 1995, and by any other country until December 31, 1993. The period of grace in favor of developing countries recognizes the fact that there is a sea change in attitude amongst developing countries in relation to the protection of plant varieties, but that it will take some time for those countries currently expressing interest to actually introduce legislation. It was thought that whilst the 1978 Act is now of great interest to many developing countries as a basis for national legislation, the 1991 Act might in some cases require further study prior to its incorporation into the national laws of some developing countries. The period of grace for other countries takes account of the fact that a number of States have already initiated proposals for legislation upon the basis of the 1978 Act, and the grace period until December 31, 1993, should enable them to finalize their legislative activity and accede to the Convention on the basis of the 1978 Act.

The following provisions of the Convention are relevant to the patent/breeders' rights interface question:

(i) Article 1 contains a definition of "variety" which is capable of deployment for both patent law and breeders' rights law purposes.

(ii) Article 2 no longer contains a ban on "double protection."

(iii) Article 3 requires all States which adhere to the 1991 Act to protect all plant genera and species, and Article 14 extends the scope of protection (under limiting and very strict conditions) to the end product of the plant variety. These provisions together remove the gaps in protection which existed under the 1978 text.

(iv) Article 14(5) introduces the important new principle of essential derivation.

I deal below with these provisions in more detail.

Article 1(iv) - Definition of Variety

The 1978 Act contains no definition of "variety" while the 1961 Act of the Convention provides that "For the purposes of this Convention, the word "variety" applies to any cultivar, clone, line, stock or hybrid which is capable of cultivation and which satisfies the provisions of subparagraph (1)(c) and (d) of Article 6." The provisions of these subparagraphs specify the conditions of homogeneity and stability which must be satisfied by a plant variety prior to a grant of breeders' rights.

The definition of "variety" incorporated into the 1961 Act of the Convention is almost, but not quite, synonymous with "variety which is protectable under the Convention." In framing a definition in 1991, it was thought that there should be a clear distinction between the definition of "variety" and a variety which meets the technical criteria of Articles 7, 8 and 9 of the 1991 Act of the Convention so as to be a protectable variety. This is to ensure that a variety with a level of uniformity which is accepted as a variety in certain countries but is unacceptable for the purposes of a grant of rights may still exist as a "variety" and be taken into account, for example, for the purposes of common knowledge and distinctness under Article 7. The fact that the definition of "variety" is wider than "protectable variety" is made clear by the use of the words "irrespective of whether the conditions for the grant of a breeder's right are fully met" in the introductory phrase.

In order to establish an identity for any variety, protectable or otherwise, it must be distinct from other varieties, certain characteristics must be displayed with reasonable uniformity by its component individuals, and it must retain its identity from one generation to the next. The conditions of distinctness, uniformity and stability which are necessary for the purposes of establishing an identity for a unit of plant material to which breeders' rights are to attach, are thus also necessary, but possibly to a more limited extent, when deciding that particular plant material constitutes a variety. The three indents in the definition correspond respectively to the requirements for uniformity, distinctness and stability but were considered to set these requirements at a lower level than that necessary for protection.

The expression "plant grouping" used within the definition corresponds to the French "ensemble végétal" and leaves open the question whether a variety must invariably be constituted by more than one whole plant.

Article 2 - The Basic Obligation of Contracting Parties

The basic obligation of States party to the Convention that "each Contracting Party shall grant and protect breeders' rights" is imposed by Article 2. "Breeder's right" is defined in Article 1 as "the right of the breeder provided for in this Convention." Accordingly, each State party to the Convention must grant protection on the conditions specified in Chapter III (and subject to no further and different conditions), with the minimum scope of protection required by Chapter V, and in accordance with all other relevant provisions of the Convention. The fact that a country protects plant varieties by an industrial patent, for example, will not enable it to accede to the UPOV Convention. A country must protect plant varieties using UPOV criteria if it wishes to satisfy Article 2 and to become a member State of UPOV.

Unlike the first sentence of Article 2(1) of the 1978 Act, the 1991 Act is silent on the form of the breeder's right. It may take the form of a special sui generis breeder's right, or it may be called a "patent" or be given any other designation provided it has the minimum substance provided for in the Convention. The 1991 Act equally contains no provision corresponding to the second sentence of Article 2(1) of the 1978 Act (the so-called "ban on double protection") so that a Contracting Party is, so far as the 1991 Act is concerned, free to protect varieties, in addition to the grant of a breeder's right, by the grant of other titles, particularly patents. A member State exercising this freedom to grant patents in addition to the breeder's right is free to decide whether an applicant must choose between a breeder's right and a patent, that is, if he applies for one, he cannot apply for the other, or

whether he can apply for and be granted both the breeder's right and the patent. If, for any given variety, cumulative protection of this kind is obtained, the resolution of any conflict between the two kinds of protection is left to the legislation and courts of the member State where the titles were obtained and is not regulated by the Convention. Equally, of course, any country acceding to the 1991 Act may exclude plant varieties from patenting if it so chooses, but it does not have to do so.

Article 3 - Genera and Species to be Protected

Article 3 corresponds to Article 4 of the 1978 Act and is concerned with the genera and species to be protected. The system of the 1978 Act is to require member States to protect a minimum of five genera or species on accession to the Convention, and to require that thereafter member States protect genera or species on a progressive basis, leading to a minimum of 24 genera or species after eight years. Article 4 of the 1978 Act does contain a provision that member States should undertake to adopt all measures necessary for the progressive application of the Convention to the largest possible number of botanical genera and species, but in no way imposes on member States a clear commitment to protect the whole plant kingdom. Article 3 of the 1991 Act, however, requires existing member States to protect all plant genera and species five years after becoming bound by the new text and requires new member States to protect all plant genera and species ten years after they become bound by the 1991 Act, so that over time a worldwide UPOV system of plant variety protection will emerge which requires all member States to protect all plant genera or species.

Article 14 - Scope of the Breeder's Right

Article 5 of the 1978 Act provides that the prior authorization of the breeder "shall be required for:

- the production for purposes of commerical marketing,
- the offering for sale,
- the marketing ..."

The breeder's authorization is then not required for production and use of seed which is not marketed.

Article 14(1) of the 1991 Act provides that, in respect of the propagating material of a protected variety, any production, reproduction (multiplication), conditioning for the purpose of propagation, offering for sale, selling or other marketing, exporting, importing, or stocking for any of these purposes, shall require the authorization of the breeder. Accordingly, the basic scope of the protection extends to all production or reproduction (multiplication) without a reference to its purpose and, unlike the 1978 Act, does not have the effect of creating, by implication, a "farmer's privilege."

The very widely differing natures of the agricultural industries of UPOV member States and the varying political situations in these States have nonetheless made it essential to include in the new Act a provision entitling States on an optional basis to except the planting of farm-saved seed from the requirement for the breeder's authorization. The provision in question is contained in Article 15(2).

The mandatory minimum scope of protection under Article 5 of the 1978 Act is limited to the reproductive or vegetative propagating material, as such, of the variety. A major question debated in the course of the revision process was whether the scope of the breeder's right should be extended in a more general way to the harvested material of the protected variety or to products produced by processing the harvested material.

The Diplomatic Conference decided the above question positively. Article 14(2) of the 1991 Act does make provision for the scope of the breeder's right to extend to harvested material including entire plants and parts of plants where these have been obtained through the unauthorized use of propagating material of a protected variety, but qualifies the scope by providing that this scope of protection exists, "unless the breeder has had reasonable opportunity to exercise his right in relation to the propagating material of the variety."

The majority of the member States of UPOV who voted in the Diplomatic Conference on the text of Article 14(2) were not prepared to extend to the breeder an untrammeled choice between the exercise of his right in relation to the propagating material and its exercise in relation to the harvested material. They were not, for example, prepared to permit the breeder to be totally free to exercise his intellectual property right over the grain instead of the seed. There was, however, general agreement in the Diplomatic Conference that a breeder needed to have a right exercisable over the harvested material of his variety when he had had no opportunity to exercise a right in relation to the propagating material.

Article 14(3) of the 1991 Act provides for the further extension of the right of the breeder to products made directly from harvested material. This provision is not, however, part of the mandatory minimum scope of protection under the 1991 Act. States adhering to the 1991 Act may choose whether they wish to extend the breeder's right in accordance with Article 14(3).

Article 14(5) - Essentially derived varieties

Under the provisions of Article 6(1)(a) of the 1978 Act, any variety is protectable which, inter alia, is clearly distinguishable, at the time of application, by one or more important characteristics from other commonly known varieties and which is sufficiently uniform and stable. Article 5(3) of the 1978 Act provides that a protected variety may be used as an initial source of variation for the purpose of creating other varieties. The two provisions taken together create a situation in which an existing protected variety may be used as a source of initial variation and a variety selected therefrom may be freely exploited by the selector free of any obligation to the breeder of the protected variety, provided that the selection is clearly distinguishable by one or more important characteristics from the protected variety. Since the word "important" in this context has been construed to mean "important for the purposes of making a distinction" and not "important in the sense of having value," this has meant that a person selecting a mutant or a minor variant from an existing variety or inserting an additional gene into it by back-crossing or some other procedure can protect the resulting variety without rewarding the original breeder for his contribution to the final result. Typical examples are the selection of a color mutant from an ornamental variety, the insertion of a single gene into a maize line by back-crossing (under the favorable conditions of the tropics, multiple back-crosses can be effected in one year) and more recently, the insertion of a single gene by genetic engineering. The fact

that the 1978 Act does not enable the breeder to prevent breeding approaches of this kind has been criticized as unjust by industrial circles and the 1991 Act seeks to remedy this situation by introducing the principle of "essential derivation." Article 14(5) of the 1991 Act provides that a variety which is essentially derived from a protected variety cannot be exploited without the authorization of the breeder of the protected variety. A variety is deemed to be essentially derived from another variety ("the initial variety") for this purpose when

> "(a) it is predominantly derived from the initial variety or from a variety that is itself predominantly derived from the initial variety while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety;
>
> (b) it is clearly distinguishable from the initial variety;
>
> (c) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety."

Article 14(5) provides a non-exhaustive list of examples of acts that may result in essential derivation including the selection of a natural or induced mutant, or of a somoclonal variant, the selection of a variant individual from plants of an initial variety, back-crossing, or transformation by genetic engineering.

It is not envisaged that a determination concerning the essential derivation of a variety will be made by an examining office as part of the grant procedure, but rather that the question will be resolved between plant breeders by agreement or in the last resort through litigation.

The existence of the new principle should ensure in future that those working as innovators in the field of plants will reach agreement before they undertake a program of activity which could result in varieties that are essentially derived from protected varieties. It is hoped that in the vast majority of cases amicable arrangements will be made between plant breeders and/or biotechnologists. If a plant breeder inserts a gene falling within the claims of an invention relating to genetic information (a "patented gene") into his variety, the resulting variety could fall within the scope of the patent enabling the patentee, in effect, to prohibit the exploitation of the variety. If, on the other hand, the patentee inserts the patented gene into the same variety, the breeder of the variety has no possibility at present to forbid the exploitation of the modified variety. In future, if a patentee of a gene inserts his patented gene into a protected variety, there will exist the possibility that the modified variety will be essentially derived and fall within the scope of protection of the protected variety. It is thought that the new balance established between the two systems in this way will facilitate the exchange of technology between plant breeders and biotechnologists and addresses one of the major interface questions.

The revision of the UPOV Convention has effected a significant strengthening of the protection afforded to plant breeders in UPOV member States and represents a first concrete step in addressing the questions which arise in relation to the interface between breeders' rights and patents. Many of the issues will, however, remain outstanding and will only be resolved over time.

There have been rather few patents granted in the field of plant innovation in most countries and even fewer such patents have been the subject of litigation. Whilst the subject of patents for plant genes can be discussed in general terms, the precise circumstances in which such patents will be granted remain unclear and the scope of protection available is even less clear. Until more such patents are granted and litigated the true nature of many of the problems of the interface will remain unclear.

Even in the United States of America where patents are granted for plant varieties, the amount and kind of innovation which is necessary to satisfy the inventive step or non-obviousness criteria has not yet been widely clarified by practical example.

The revision of the UPOV Convention will not change the interface situation except in the specific ways that I have suggested. Article 53(b) and its exclusion of plant varieties from patenting will remain as a provision of the European Patent Convention. Similar exclusions will remain within the national laws of many States. Changes to the relevant provisions of national laws seem likely to be fiercely debated. All UPOV member States will continue to be bound by the provision of the 1978 Act of the UPOV Convention for many years to come in relation to one or other of the existing member States.

A number of States who wish to maintain the exclusion of plant varieties from patenting, but who have nonetheless favored the absence of a provision prohibiting double protection in a revised UPOV Convention, have made it clear that the absence of this provision in the UPOV Convention will not predetermine the outcome of future discussions on whether plant varieties should or should not be the subject of patent protection. The subject of exclusions may also be influenced by the TRIPS discussion of the Uruguay Round in GATT and by current proposals for the harmonization of patent laws.

Meanwhile, however, amidst the uncertainties arising from so many current discussions underway in different fora, UPOV has provided the necessary framework for a substantial future improvement in the protection available to innovators in the field of plants by its adoption of the revised 1991 Act of the Convention. It remains for existing and future member States to introduce laws in conformity with the 1991 Act to turn this potential for improved protection into reality.

THE EXPERIENCE OF A MEMBER STATE OF UPOV

INTRODUCTION

What I aim to do is to share with you the experience we in New Zealand have gained over 16 years with a plant breeders' rights system. I shall say something about our procedures and the benefits and the problems. I hope this might tie together in a practical way some of the points made by previous speakers and be of use to Latin American countries that may be considering moving to protecting plant varieties under the UPOV Convention.

Firstly some facts about New Zealand might help to put my comments into their proper context.

Land area: 269,000 sq.km

Population: 3.4 million

Climate: cool to warm, temperate - maritime

Agriculture: Agriculture is most important. The New Zealand economy has traditionally been based upon the export of produce from pastoral farms and associated industries. While manufacturing and service industries are becoming increasingly important, sales of animals, meat, dairy produce, wool and fruit still make up 45% of total exports. Farms are usually in private ownership - typically family ownership - and well mechanised. Farmers receive virtually no taxpayer subsidisation.

DEVELOPMENT OF PLANT VARIETY PROTECTION IN NEW ZEALAND

The plant variety protection system in New Zealand is known as Plant Variety Rights. The original legislation, the Plant Varieties Act 1973, was enacted in 1973 and the plant variety rights scheme came into operation in 1975 under the administration of the Ministry of Agriculture and Fisheries.

Over the first few years up to 1979 the plant variety rights scheme was quite limited in scope. At the start it applied only to roses and had grown by 1979 to cover a total of only eight genera and species.

Looking back I believe it was probably a good idea and perhaps necessary that we had a period of slow growth at the start. It enabled those involved in the scheme to feel their way in what was a new area of activity. However in other ways this initial period with a scheme so limited in scope had unsatisfactory features.

- It meant that the country was not getting the full potential benefits of the legislation.
- The limited scheme was unfair. While breeders of barley and rose varieties could obtain rights, breeders of wheat and apples could not. The wheat and apple breeders could not see the logic in this.

- Those breeders who could not get rights spent much time and effort lobbying for their genus to be included. Government officials spent time dealing with submissions from breeders, deciding what genus to include next and arranging the necessary regulation changes every time a genus was added. This was time that could have been more productively spent.

In 1979 breeders and interested parties urged the Ministry of Agriculture to extend the plant variety rights scheme to cover all plants and to do this as quickly as possible. The Ministry agreed that this was desirable and by 1981 the plant variety rights scheme was opened up to include all kinds of plants except for fungi, algae and bacteria. New Zealand was one of the first UPOV member States to provide plant variety protection for virtually the entire plant kingdom.

EXAMINATION PROCEDURES

In 1979 we had to face the question--if we were to open up the plant variety rights scheme to many more plants--how should we examine the applications? Before we could make decisions we had to consider a number of factors.

Legal and Technical Integrity

We wanted a plant variety rights scheme that was legally and technically sound. Also as we wished to join UPOV we needed to ensure that procedures and standards complied with those of UPOV.

Cost Restraints

New Zealand is a comparatively small and not particularly wealthy country and we knew there would be only limited government funding for plant variety rights. Further because the New Zealand domestic market for plants and seeds is quite small our breeders could not afford the high fees that breeders in larger markets might readily accept. For these reasons we would have to look at devising low-cost rather than high-cost examination procedures.

Overseas Test Reports

In 1979 we could see little possibility of using examination results from other countries. This was for two main reasons.

- Firstly there are significant climatic differences between New Zealand and other UPOV countries. It is commonly observed that a variety description prepared in another country does not correspond with the appearance of the variety when grown in New Zealand. Also because of different photoperiod and light intensity conditions a variety found to be uniform elsewhere may be non-uniform in New Zealand.

- The second problem is that for some important genera, such as wheat, the varieties in commerce in New Zealand are not grown anywhere else. A foreign test authority would have difficulty taking these into account when arriving at a decision on distinctness for the new variety.

Recognizing these problems we concluded that we would be unable to use foreign test reports but would have to rely upon examination in New Zealand.

Official Central Testing Versus Breeder Testing

In 1979 when we looked abroad, we could see two very different systems of examination--official central testing and breeder testing. We had considerable debate on the disadvantages and advantages of both.

The most obvious option was examination on an official basis at a central testing site as was conducted in the countries that were then members of UPOV. This was the system that had been in place in New Zealand since 1975 for our limited scheme. It did have the advantage of being sure and thorough. However it was seen as being expensive--too expensive a procedure for us to follow for all kinds of plants. It was also criticized by those in the agriculture sector as being too slow and as a consequence seen as delaying unnecessarily the commercial release of promising new varieties.

The other very different option of examination was the United States system of breeder testing where the onus is on the applicant rather than an official testing authority to describe the variety and to establish that it is distinct, uniform and stable. This system attracted us because it involved less cost to the taxpayer. Also protection could be granted sooner allowing varieties to be released into commerce sooner. However there were some doubts. We in the Plant Variety Rights Office wondered about the technical acceptability of an office examination which seemed to involve the comparison of a written description of a candidate variety against descriptions of similar varieties where the descriptions may have been prepared in different regions and in different seasons. We felt that the only sure way to establish distinctness between two very similar varieties was to grow them side-by-side in a scientifically laid out comparison trial.

Behind the obvious difference in practical procedure between US breeder testing and European official testing there seemed to be a significant philosophical difference. A US grant of plant variety protection, I am told, is as good as the information supplied by the applicant. If the applicant's information is faulty, the grant of protection will not stand up in court and is of little or no value. With official testing on the other hand a grant of plant variety protection has the backing of a thorough evaluation carried out by an official testing authority and as a result there is acceptance by those in the market that the breeder has secure protection that will meet challenge in court. Both philosophies represent different but valid points of view. In New Zealand we have favored the philosophy of the European countries.

After much debate we finished up by adopting a mix of examination procedures trying to combine the good points of both systems.

With roses, because we had a reasonably large number of applications each year and there were numerous varieties of common knowledge against which a new variety had to be distinguished, we stayed with the system of official examination at a central testing site.

In the case of arable crops, pasture plants and vegetables we moved to a system of breeder testing. As in the United States of America the onus is on

the applicant to provide a detailed variety description and to demonstrate how the new variety is distinct. However we place rather more rigorous demands upon the breeder than in the United States of America. For example we require a scientifically conducted comparative growing trial to establish that a new variety is distinct from very similar varieties. We were reasonably confident in introducing such a system for agricultural varieties, as the applicants generally are large breeding organizations such as government departments or private seed companies that employ scientifically trained staff. These staff should be quite competent to carry out the necessary trial work. Also compared with larger countries we anticipated rather few applications per year, we had comparatively few varieties of common knowledge and as a result the problems of establishing distinctness were accordingly not too difficult.

With fruit and ornamental varieties (other than roses) the situation was rather different. While we anticipated rather few applications for each genus or species, the applicants tend often to be individuals or quite small organizations and the persons involved do not necessarily have appropriate scientific skills or training. With these plants the common procedure is for official examination--on the applicant's property. We ask the applicant to give us access to plants of the new variety at an appropriate stage of maturity. If necessary, we ask him to grow plants of very similar varieties alongside. We arrange for someone, usually an officer from the Ministry of Agriculture based in the locality, to visit the property and over a complete growing season, prepare a detailed description, take photographs and collect plant samples such as fruit or flowers. When this work is completed we refer the information and samples to a designated expert in the genus. This expert is someone with a good knowledge of existing varieties. He will be asked to recommend whether the variety is distinct, uniform and stable. Based upon the expert's recommendation plant variety rights will be granted or refused.

By adopting this mix of examination procedures in the early 1980's we felt sufficiently confident to open up the scheme to all kinds of plants. To some extent this rapid growth in the plant variety rights scheme was a step in the dark. There was a possibility that we might be flooded with so many applications that we might not be able to cope. As it turned out any such fears were not realized.

How has the mix of procedures worked out in practice? The answer is that in general the procedures have proved to be satisfactory. There have been problems from time to time but by working closely with breeders and interested parties we have been able to resolve them. However since 1981 we have made some changes.

Overseas Test Reports

While initially we had decided against using overseas test reports we have subsequently modified our position. We now believe that with certain kinds of plants it is technically acceptable and cost efficient to use foreign test reports. With some plants such as carnations or indoor plants which are grown in glasshouse indoor conditions insulated from climatic influences, we are happy to purchase overseas test reports especially from a country specializing in the breeding and the examination of the genus or species concerned. It seems sensible to take advantage of expertise in other countries that we do not have in New Zealand.

Move to Central Testing

With some genera, perhaps as a result of the incentive provided by the legislation, applications for plant variety rights have been at levels greater than we had expected. We moved from a situation of few applications and few varieties of common knowledge, to a situation of comparatively numerous applications and increasing numbers of varieties of common knowledge. The examination procedures we had set up in the early 1980's were less appropriate in this changed situation. We could see that if we did not make a change to a more appropriate system there would be problems for the Plant Variety Rights Office and also for breeders. In particular there would be problems for the Plant Variety Rights Office and also for breeders. In particular there would be increasing difficulties establishing the distinctness of new varieties. Such a problem arose with ryegrass two years ago and more recently has arisen with pip and stonefruit. In both cases it was agreed that a move to a system involving examination at a central testing site was necessary.

In the case of ryegrass, with the agreement of all breeders, we moved from the old system under which each applicant conducted his own trials to a system under which all candidate ryegrass varieties are evaluated at two test sites. It is still a breeder testing system in that the work of evaluation at the two sites is organized and paid for on a cooperative basis by the participating breeders. Testing follows an agreed detailed protocol.

With pipfruit, especially apples, and with stonefruit, especially peaches and nectarines, we have within the last few months, moved away from the old system of official evaluation on each applicant's property to a system of examination at a central site. Examination will take place at the New Zealand National Cultivar Centre, a new fruit industry facility recently established as a result of a partnership arrangement between the Department of Scientific and Industrial Research, a government department with research interests in the fruit industry, and the New Zealand Apple and Pear Marketing Board. The staff at the National Cultivar Centre will carry out examinations in accordance with Plant Variety Rights Office requirements.

PLANT VARIETY RIGHTS STAFFING AND COSTS

On the basis of number of applications the New Zealand plant variety rights scheme is comparable in size with that of Belgium, Sweden, Switzerland and South Africa.

We have a staff of four. Apart from myself there is one examiner involved with fruit and ornamental varieties, one part-time examiner involved with arable, pasture and vegetable varieties and one typist/clerk. In addition we are assisted by the efforts of about twelve persons (mainly Ministry of Agriculture officers) who carry out examinations of fruit and ornamental varieties for us on applicant's properties. Also a number of persons assist as experts.

The cost of plant variety rights has been a longstanding problem. Successive governments in New Zealand in recent years have had a policy of "user pays." As a result we have been under continuing pressure to recover the costs of the plant variety rights scheme from the fees we charge to breeders. Even though we have deliberately opted at all times for low cost alternatives we have so far not achieved full cost recovery. The basic problem is that because we have comparatively few applications per year our income base is

limited; and if we increase our fees by too great a step the exercise tends to be counterproductive because breeders make fewer applications.

However the cost recovery situation is improving. This is partly because the number of applications each year is increasing. More important though is that as each year passes the number of protected varieties increases--and for each protected variety an annual fee is paid. This represents a growing income base. We now expect that in the next financial year we should recover all operational costs of plant variety rights.

IMPACT OF PLANT VARIETY RIGHTS

Response by Breeders

One measure of the effect of plant variety protection legislation is the number of applications each year. In New Zealand the total number of applications has fluctuated from year to year but there has been an underlying trend of growth rising from 59 in 1981 to 128 in 1990. We see this as an indication of increasing availability of new plant varieties, surely a healthy indicator in a country very dependent upon production from the land.

I can give more specific examples of the effect of the New Zealand plant variety rights legislation from the different categories of plants involved.

Ornamental varieties make up 63% of total applications with roses being by far the most popular genus. One very early result of the decision of the New Zealand Government to introduce plant variety rights legislation was that Mr. Sam McGredy, a leading international rose breeder, migrated to New Zealand bringing his rose breeding business with him. His migration from Ireland was a direct result of the introduction of the legislation. The country has since benefited in a small but positive way from Mr. McGredy's ability to earn overseas funds.

Fruit varieties comprise 21% of applications and in this category apples are the most important. The New Zealand apple industry has for many years been consistently profitable. With this background and I believe as a result of the availability of plant variety rights for apples for the last ten years, New Zealand has recently become a quite dynamic centre for apple breeding.

Arable crops and vegetables comprise 9% of applications. The plant variety rights legislation had a marked impact on the arable sector. Prior to the legislation there had been little private sector plant breeding. However private sector interests were most enthusiastic about plant variety rights and the legislation prompted substantial investment by private companies into plant breeding and the introduction of new varieties from abroad. There was a boom that peaked in about 1984 and then subsequently declined. The decline however has been to a level that is still 83% above that prior to the introduction of plant variety rights. There are a number of explanations for the boom and decline. The breeders at the start probably had an over-optimistic view of the financial rewards available from royalties and controlled marketing and over-invested. A factor contributing to the decline has been a severe depression in the arable farming industry in New Zealand since 1985. Another factor discouraging cereal and pulse breeders has been the problem of farmer's privilege. This is the freedom of farmers to retain seed of protected varieties for resowing without paying a royalty, with the result that breeders are

limited in recovering breeding costs through royalties. It is worth noting that over this period government breeding activities continued at much the same level.

Grasses and clovers comprise the remaining 7% of applications. Before plant variety rights there was only one government organization involved in grass and clover breeding. This organization initially showed little interest in plant variety rights. However interest has gradually developed and there are now two government and four private groups involved in breeding pasture plants. It would actually have been most surprising if this growth had not occurred as the New Zealand economy is heavily dependent upon pastoral farming for which improved pasture varieties are most important. These groups involved in breeding pasture plants are now increasingly looking at market opportunities for their varieties outside New Zealand, especially in Southern Hemisphere countries such as those of Latin America, Australia and South Africa.

Variety Introductions from Abroad

One motive for the introduction of plant variety protection legislation is to provide an incentive for the release of promising new foreign varieties. New Zealand plant variety legislation has been successful in this regard. In 1990 over 60% of the applications for protection were for foreign bred varieties. Over the 12 year period from 1975 to 1987 while New Zealand had a plant variety protection scheme in operation, our closest neighbor Australia did not. This created an interesting situation which allowed a good indication of the benefits plant variety rights can bring. Over these years improved North American varieties of apples, peaches and nectarines were made readily available to New Zealand fruit growers but were unavailable to Australian growers. Another example concerned the very succesful East German malting barley variety 'Triumph.' New Zealand through plant variety rights was able to obtain early access to it and as a result was able to grow substantial quantities of grain of 'Triumph' for export earning in excess of $ 20 million in annual sales for a number of years. Because Australia did not have plant variety rights it could not gain access to 'Triumph' barley until much later.

Costs and Benefits for Breeders

A recent review of plant variety rights in New Zealand* pointed out that the cost of breeding plant varieties in New Zealand is similar to the cost elsewhere but the royalty market is small. This creates a problem for some breeders. An illustration of this problem is the government wheat breeding program which costs $ 0.5 million a year and produces one new variety a year. However the total royalty returns over 10 years from the two best wheats 'Oroua' and 'Rongotea', which dominate the New Zealand market has been just under $ 1 million. In other words even though these two wheats have been very successful and long lived, they have not returned their costs in total royalties. Against this it has been argued that there are social benefits from the wheat breeding program. In some years the social benefits have been calculated at fourteen times the cost when royalties, increased yield and improved quality are taken into account.

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* Bezar, H.J., Wynn-Williams, R.B., and Stewart, A.V., "Plant Variety Rights in New Zealand: A Review," Proceedings Agronomy Society of N.Z. 20. 1990.

CONCLUSION

We have been able to establish a scheme covering all kinds of higher plants at a reasonable cost, one that gives a breeder a secure grant of plant variety protection. There is general acceptance in New Zealand that plant variety rights is useful if not essential if our country is to be competitive internationally in agriculture and horticulture.

We have found benefits in being a member of UPOV.

- The UPOV Convention is a useful model for a practical and effective plant variety protection system.

- The technical guidelines and standards of UPOV are of great assistance to us as we process applications.

- There are savings in reciprocal testing arrangements.

- We get benefits from our contact with the UPOV Secretariat as well as from contact with colleagues in other member States.

- Membership assists our breeders to commercialize their new varieties in other countries.

REPORTS FROM REPRESENTATIVES OF THE COUNTRIES OF THE REGION AND DEBATE

1. Mr. Barry GREENGRASS (Vice Secretary-General of UPOV) stated that it had been the practice in other seminars of a similar nature to start the discussion with reports from representatives of the participating countries on the situation at national level, and that this practice had proved very useful. He therefore suggested that there be first a round of country reports.

2. Mr. Eduardo CARRILLO TOMIC (Chile) mentioned that his country had legislation to recognize the rights of the breeders of new plant varieties that was similar to the UPOV Convention, in particular as regards the conditions for the entry of varieties in the Register of Variety Property and the contents of the property right. The basic legal provisions were to be found in Decree-Law N° 1764 of 1977 and the General Regulations thereunder. To confer greater stability to the legal system in the field of varieties and seeds, the Ministry of Agriculture was currently preparing a first draft of a law to include in the existing law those provisions of the regulations that were in fact a matter of law. On the other hand, Senator Alessandri had presented a motion to Parliament on the drafting of a new law on variety ownership; he was at present in contact with the Ministry of Agriculture to see how to submit a joint draft. Senator Alessandri was an important opposition representative; if an agreement were to be reached with the majority, the draft would have good prospects of becoming law in the next year.

3.1 Mr. João SCHNEIDER (Brazil) said that he was in charge of coordinating a working group within EMBRAPA which had been mandated to write an outline for a first draft of a plant variety protection law, to assist the Ministry of Agriculture and also an Interministerial Commission which had been set up by the Ministry of Justice to establish the final draft that would be submitted to National Congress. The working group had planned a discussion stage with all interested circles in the country; but, for its part, the Ministry of Agriculture had urged that the draft be completed as soon as possible because the Interministerial Commission only had 30 days from the date of its inception to produce the final draft.

3.2 In Brazil, the question of plant variety protection was perhaps more complex than in other countries, since some sectors were very much opposed; opposition partly arose from the echo of the polemics over the revision of the law on industrial property, and also from wrong information or lack of information. Some circles also firmly believed that it was premature to formulate a statute for the protection of plant varieties. For these reasons, it would have been very important to have more time for wider discussions to generate a more objective climate and search for the best way of addressing the issue.

3.3 The current situation was as follows: the Interministerial Commission had produced the final version of the first draft, which, after some technical and legal redrafting, would be submitted to National Congress, still this year. However, the matter was unlikely to be taken up in the current legislature, which ended on December 15. Mr. Schneider undertstood that the first draft had to be revised in some respects for it to be in full conformity with the principles of the UPOV Convention. This might be done next year, once the first draft was formally before National Congress.

4.1 Mr. Felipe de Jésus OROZCO (Mexico) said that the Law on Seed Production, Certification and Trade of Mexico had been prepared in December 1960 and published on April 14, 1961. Until 1983, it had been amended only moderately; on September 15, 1991, the law underwent an important change in respect of some essential features such as the accreditation for the certification of seeds. The former law envisaged the protection of the rights of the breeders in connection with the National Register of Plant Varieties. The new law only provided for a register in its function of list of varieties enabling their identification with regard to their agronomic, biochemical, sociological and other characteristics. Seed certification would remain in conformity with the traditional system and would be the task of the Ministry of Agriculture and Water Management. Seed control would be entrusted to the seed enterprises.

4.2 On the other hand, a Law on the Promotion and Protection of Industrial Property was published on June 25, 1991; it contained an Article--Article 20(1)(a)--which provided for the patentability of plant varieties. This had been discussed with specialists, and also representatives of UPOV since Mexico had the obligation, if it wished to become a member of UPOV, to harmonize those two laws and adjust them to the requirements set by UPOV; some proposals had already been considered to that effect.

4.3 This was of particular importance for Mexico from the point of view of foreign trade with varieties. Mexico also had to create, in the context of the free trade agreement with the United States of America and Canada, a climate of confidence which would in particular permit the reciprocal introduction and commercialization of new varieties. Mr. Orozco concluded by saying that, in his personal opinion, the legal framework of Mexico was not of the kind to promote this type of exchange which benefited so much agricultural productivity in general.

5.1 Mr. Juan MANCUR DONIS (Guatemala) said that since 1970, as a result of the Law on the Public Agricultural Sector and Food, there existed within the General Directorate for Agricultural Services a Technical Directorate for Seeds in charge of certifying the quality of seeds and vegetative propagating material. The Institute for Agricultural Sciences and Technology was in charge of research and had created a number of varieties, in particular of maize, beans, rice and sorghum. The private sector was working independently, each party protecting for itself the materials he had obtained; unfortunately, there was no specific legislation to protect propagating material. Nevertheless, there currently was a favorable climate both at the Executive and the Congress of the Republic; work was going on to restructure the public sector in the agriculture and food area with a view to improve its functioning as from 1992.

5.2 Mr. Mancur Donis concluded by thanking UPOV for the invitation extended to his country to participate in an event which would permit to share experiences and promote the type of legal norms that was necessary to achieve the objective under discussion in this seminar.

6. Mr. Miguel ESPINOZA (Paraguay) said that the seed law of Paraguay dated back to 1972; it did not provide for the breeder's right. The legislation was being reconsidered, and particular importance was given to the inclusion of a new chapter on the protection of new plant varieties in view of the fact that there currently was a draft regional agreement on the subject within CONASUR.

Mr. Espinoza felt that, perhaps within the forthcoming year, Paraguay would have a new seed law that would cover plant variety protection. There was already a first draft which was being studied within the public and private sectors, including the Association of Seed Producers.

7. Mr. Mario CAVIEDES CEPEDA (Ecuador) declared that the National Institute for Agricultural Research (INIAP) was undergoing an institutional restructuring with a view to introducing greater administrative and financial flexibility. The law which was before the National Congress contained some Articles which referred to something corresponding to plant variety protection or patents for plant varieties produced by the research institutes. A cross-institutional commission was looking into an updating of the 1974 seed law and its implementing regulations for submission to Congress. Mr. Caviedes Cepeda felt that the new law might include some of the general principles governing plant variety protection recommended by UPOV.

8. Mr. César BOZA MIRANDA (Nicaragua) indicated that Nicaragua also had a seed law, but nothing about plant variety protection. The interest in participating in this seminar laid in the objective of acquiring knowledge about this matter so as to be able to do something about it when returning home.

9.1 Mr. Arcides MARTINEZ TORRES (Cuba) said that no legislation on variety protection had been promulgated in Cuba, and there was no seed law as such. Ministerial resolutions had been published on seed certification, and rules on the register of varieties; expert commissioners had been appointed for the approval of varieties for introduction into the seed production program. The Patents and Trademarks Office had analyzed the possibility of considering varieties as inventions, but no decision had been taken on this; within the Ministry of Agriculture, the task had been given to draw up rules on this and other subjects in order to create a basis for the case where the country should decide to proceed. Work was currently done on this. Draft seed legislation which did not deal with variety protection, but with the variety register and seed control, had been submitted to the Government.

9.2 Mr. Martínez Torres concluded by thanking UPOV and Argentina for the invitation and the ensuing possibility of acquiring experience in a matter that was important from the point of view of variety creation and seed production.

10.1 Mr. Jorge ROSALES KING (Bolivia) said that a supreme decree of 1972, which had been supplemented by a ministerial resolution, afforded protection for varieties of private institutions, but not for those of public institutions. Work was currently going on, however, to remedy this; a division of the Variety Protection Register had been requested to enable the national research centers to also protect their varieties. The first objective was to create an incentive to research in the centers since their work currently focused on the introduction and evaluation of varieties from International Centers. On the other hand, protection would mobilize funds to ensure continued research activities and overcome the economic problems which had been serious in recent years. It should be added that protection had never been granted since there was no private institution involved in research. This was the reason why this matter had never been pursued.

10.2 With the new division of work resulting from the interest of various national institutions and international companies for certain types of variety research in Bolivia, a parallel law exclusively dealing with variety protection might be established. There was much interest for such a special law.

11.1 Mr. Gustavo BLANCO DEMARCO declared that plant variety protection had been included in the current seed law as early as 1981. Various amendments were introduced in 1983, 1987 and in the course of this year to put the legislation in line with international standards. In Uruguay, a right was granted to the breeder through an ownership title entered in a register created for the purpose. There was a system of official testing to check the characteristics of the material for which protection was sought. Protection was currently applicable to 10 species, eight titles had been granted and some five applications were pending. This year, the Council of UPOV also studied the Uruguayan legislation and gave its approval to it; the legislative authorization to adhere to UPOV was under preparation. The policy in Uruguay was to study each species before extending protection to it, and to hear the views of the interested parties as to which species should be protected.

11.2 As mentioned by Mr. Espinoza, the member countries of CONASUR were working on an agreement which would enable them to share experiences, to have harmonized legislation and to have common positions in the international debates. This work should be completed shortly. A program for cooperation in the region was also being elaborated with a view to pursuing the objectives set out in the agreement.

11.3 Mr. Blanco Demarco concluded by thanking the Ministry of Agriculture, Fisheries and Food of Spain, UPOV and the Secretariat of Agriculture, Livestock and Fisheries of Argentina for the opportunity to participate in this event and share experiences.

12. Mrs. Thaimy MARQUEZ (Venezuela) stated that Venezuela was in a period of transition; it was examining the international context and its own international relations, and trying to create suitable conditions for attracting foreign investment and promoting technology transfer. The five Andean countries were considering a revision of the common industrial property regime. A new decision of the Council of the Cartagena Agreement might arise from the meeting of ministers to be held in Lima on November 28. Plant varieties had been excluded from patent protection; according to a transitory provision, the countries of the Andean group had to establish a special regime for the protection of new plant varieties by December 31, 1992. They had decided to take some more time for the special decision in view of the importance of the subject and the need to acquire more knowledge about it, in particular at regional level. At national level, Venezuela had a seed law which was currently discussed by the Chamber of the Senate; the interested circles had also expressed themselves in favor of plant variety protection.

13. Mr. Augusto RAMIREZ BONIFACIO (Peru) stated that the current administration was overhauling the Peruvian agricultural sector with a series of liberalization measures. With respect to cultivars and seeds, Peru was working with a law of 1980 which was now the subject of some criticism because it was very much State-oriented; the law was administered by a National Seed Commission comprising 10 members, of which six were from the public sector. At this moment of economic opening, the law was undergoing revision with a view to

entrusting a large part of the research, production, certification and protection activities, including necessary incentives, to the private sector. The country was also in a process of regionalization, with Departmental Seed Committees being created. There was a National Seed Register, and there were also control and certification methodologies, and incentives for the breeding of new varieties and lines. A National Agricultural and Agro-industrial Research Institute was in charge of the promotion of this fundamental area of new varieties.

14. Mrs. Ana GUEVARA FERNANDEZ (Costa Rica) declared that the National Office of Seeds was an entity of the Ministry of Agriculture and Livestock with legal and financial autonomy. Contrary to other countries, Costa Rica had the great advantage that its seed legislation provided for the creation of a register of protected varieties and for the possibility of issuing the provisions governing variety protection by decree, thanks to Mr. Lopez de Haro who had contributed to the drafting of the law of 1979. Following the interest shown by national companies in exporting seeds to Europe, it had been suggested that Costa Rica should adhere to the OECD seed systems; the assistance of Mr. Elena had been requested in this respect to develop the provisions regarding the variety register, which had been done about one year ago. Work currently concerned the variety descriptions and the drawing up of the variety description forms that were necessary for a proper management of the variety register and, logically also, variety protection. Costa Rica was quite interested in setting out the provisions concerning protection on the basis of a decree-law.

14.2 Mrs. Guevara Fernández concluded by saying that, like the other participants, she would like to thank the organizers of this seminar for the invitation extended to her country.

15. Mrs. Mónica PEQUEÑO ARAUJO wished to ask Mr. Greengrass what treatment was reserved to transgenic varieties within the UPOV system.

16. Mr. GREENGRASS replied that transgenic varieties were no different from the other varieties as far as UPOV was concerned. The fact that a characteristic was transferred using a particular form of modern technology resulted in a plant variety exactly in the same way as if the more traditional technologies were used.

17. The following theorical question was asked: an enterprise from a UPOV member State takes a variety from a non-member State and introduces a gene into it by some mechanism to obtain a variety that could be considered as distinct in the non-member State and, under the 1991 Act, as essentially derived. What protection would the owner of the initial variety and the owner of the essentially derived variety have?

18.1 Mr. GREENGRASS replied that the advent of an essentially derived variety did not change the position with regard to the initial variety: whether the breeder from a non-member State could secure protection in the UPOV member States depended on the domestic law of the latter; some States were very liberal and granted protection to breeders from any other country, including from non-member States, others only granted protection to breeders from member

States, and yet others made protection subject to reciprocity in the case of the species concerned.

18.2 If the original variety was not protected, there was nothing that its breeder could do about somebody else modifying it and getting protection for the new, modified variety in the UPOV member States. If it was protected, then he would enjoy the same protection as breeders from member States, including in respect of essentially derived varieties.

19. Mr. Ricardo LOPEZ DE HARO added that for an essentially derived variety to be really treated as such, the initial variety had to be protected in the State concerned. On the other hand, if the second variety was not sufficiently distinct, and could thus not be considered as essentially derived, and it was known that there was some other variety with similar characteristics, then the said second variety could not be protected in any member State. In other words, the concept of common knowledge was worldwide, whereas the concept of essentially derived variety, in its effects, was national.

20. Mr. CARRILLO TOMIC referred to Article 6(2) of the 1978 Act of the Convention--the prohibition of conditions for the grant of protection not mentioned in the Convention--and stated that the draft new law of Chile provided that the variety had not to harm human or animal health. This referred for instance to oilseed rape varieties with a high erucic acid contents, which had been demonstrated to be prejudicial to human health. It was considered in Chile that varieties of this kind should not be given the benefit of protection, since the latter would clearly promote marketing in a situation where large-scale commercialization was prohibited; in other words, it would not be appropriate to give them the benefit of protection on the one hand and limit or prohibit marketing on the other. Mr. Carillo Tomic whished to know whether such a condition would be against the provisions of the Convention.

21. Mr. André HEITZ replied that UPOV and its member States were of the opinion, and were indeed convinced, that there should be no such condition for two main reasons:

(i) Firstly, it was a basic principle of intellectual property law that economic considerations of this kind should not interfere. It belonged to the public to give the proper reward to the breeder of a variety, which would depend on the quality of his achievement and the success of the variety on the market; and it belonged to the State to introduce marketing regulations to deal with the question raised by the previous speaker, general regulations not interfering with the intellectual property system.

(ii) Secondly, opinions and facts regarding the value of a variety were quite variable. For example, a particular variety whose marketing was not authorized in Chile might be valuable in another country and there might be an interest in undertaking the seed multiplication in Chile. To return to the case of the variety of oilseed rape with a high erucic acid content, that variety might very well be suitable for the production of industrial oils.

UPOV had therefore adopted the general principle that the conditions for the grant of protection should be of a technical nature (distinctness, uniformity and stability), of a commercial/legal nature (novelty) and of an administrative nature (compliance with the formalities and payment of fees), and that any other condition should be excluded.

22. Mr. Rodolfo ROSSI referred to item 4 of the technical questionnaire ("Information on the origin ... of the variety") and asked what was the concrete meaning of the information requested, whether this corresponded to an obligation or a suggestion and whether this was of help in connection with the issue of essentially derived varieties.

23. Mr. José María ELENA replied that it was mandatory to reply to the question on the origin and method of maintenance of the variety because the purpose of the technical questionnaire was to help in the description, identification and distinction of the variety. Knowledge about the genealogy and the true origin of a new variety was very useful for the work of the examiners. Secondly, it appeared to Mr. Elena that the information was indeed very useful when deciding whether the new variety was essentially derived or not. The Technical Committee had started to consider this issue, after the Diplomatic Conference, in particular the question whether as much information as possible should be given in the technical questionnaire in anticipation of a claim that the variety was essentially derived. The general impression of the delegations present had been that the authorities which examined the varieties and granted protection should not get involved in this issue and that it belonged to the breeder of the initial variety to show evidence of the claimed derivation.

24. Mr. Eduardo DE LA ROSA LOPEZ mentioned that the practice of the International Agricultural Research Centers, particularly CIMMYT, was to create varieties which were pure lines, for instance F_6's or F_7's, and to send them to international collections in various countries. He asked how UPOV would view the possibility that such varieties would be protected by the institutions receiving the collections, which were thus able to select different lines, and whether those institutions were the true breeder, or, on the contrary, at best the entity checking the behavior of each of the lines created by the International Center.

25. Mr. LOPEZ DE HARO said that it was very difficult to explain how UPOV saw the case of a variety that had not been created. If the International Centers fixed their varieties so that they complied with the conditions of distinctness, homogeneity and stability, then the case would be easy for they could apply for protection themselves. If what they were doing was not to obtain finished varieties, but advanced lines as they were frequently called, then there was no way of preventing varieties from being produced, through a simple selection over one, two or three years, by the national institutions which had received the material, and those institutions from having them registered as their own varieties. In Spain, the CIMMYT had authorized, by contract, certain national public sector research organizations to register in their name varieties which were based on material originating from CIMMYT. Concerning the opinion of UPOV, Mr. Lopez de Haro said that the laws of the UPOV member States all aimed at giving effect to the provisions of the Convention, which specified that new, distinct, homogeneous and stable varieties could be registered in the name of their breeder--whether from the private or public sector, or from an International Center--at his request. The Centers would be in a position to solve many of the problems that had arisen in some countries.

26. Mr. GREENGRASS added that the breeding of a variety involved the creation of an initial variation, the selection from within it, and the finishing

work to fix the variety. In the case at issue, the CIMMYT had done part of that work, and a national program, the other. The question who was the breeder in such circumstances was to be resolved in an agreement between the parties involved. In the particular case, one should look at the relationship between the CIMMYT and the national institute; the contract, if any, should answer the question. That question, therefore, was not really one for UPOV or the national plant variety protection offices.

27. Mr. Rodolfo IRIBARNE mentioned that Article 30 of the Convention required member States to "provide for appropriate legal remedies for the effective defence of the rights provided for in this Convention". Contrary to, for instance, the Berne Convention for the Protection of Literary and Artistics Works or the Paris Convention for the Protection of Industrial Property, there were no standards for the appropriate measures to be taken by the member States. He asked what measures or legal remedies were in general provided for in the national laws, and whether there were measures other than the fine, which was the measure provided for under Argentine law.

28. Mr. HEITZ replied that the legal remedies depended on national traditions. But, in general, all countries provided for civil law remedies--namely the possibility of filing an action for infringement with a tribunal to obtain compensation for the damage; in addition, most countries provided for penal sanctions in the case of particularly severe infringements. He emphasized that the legal remedies had to be actioned by the breeder himself; there was no policing of the breeder's right by the State or by State agencies such as the seed certification services.

29. Mr. ELENA quoted Article 7(2) of the Spanish Law on the Protection of Plant Varieties: "The holder of a 'Plant Variety Title' may institute civil or criminal proceedings before the Courts of Justice against any person who infringes the rights granted by this Law." Paragraph (3) stated: "Legal proceeding concerning plant breeders' rights may only be instituted by one of the parties." Those provisions were amplified in Articles 18 to 24.

30. Mr. OROZCO wished to raise the question of the exchange of plant germplasm. He felt that UPOV was neutral in this area and that the States had to set appropriate policies and prompt the research institutes to adopt the criteria which UPOV did not propose for this area. The seed certification service of Mexico had particular problems with respect to homogeneity and stability. For instance, the wheat variety 'Yecora' existed in Mexico as a two-colored mixture. The variety had been cleaned in the United States of America to produce 'Yecora roja', a red form. This was an essentially derived variety, but with advantages with respect to uniformity. Mr. Orozco also quoted the example of the cotton 'Akala', which was a Mexican variety: a company had improved it and derived another variety, but had retained the same name. The truth was that this was a form of pressure on the few Mexican plant breeders to make their varieties uniform, which would also both facilitate the identification of the genotypes and the production and certification of seeds; this was at the same time a good reason for introducing legislation more in line with the criteria established by UPOV.

THIRD SESSION

PLANT GENETIC RESOURCES AND PLANT BREEDERS' RIGHTS

Speaker: Mr. André Heitz, Director-Counsellor, UPOV

THE ARGENTINE SYSTEM OF PLANT VARIETY PROTECTION

Speaker: Mr. Héctor Ordóñez, Cabinet Assessor, Ministry of Economy, Secretariat of Agriculture, Livestock and Fisheries, Argentina

A PLANT BREEDER'S VIEW - THE POTENTIAL IMPACT OF PLANT BREEDERS' RIGHTS UPON THE PLANT VARIETIES AND SEEDS INDUSTRY

Speaker: Mr. Hector Laurence, President, Argentine Association for the Protection of New Plant Varieties (ARPOV), Argentina

PLANT BREEDERS' RIGHTS: A VIEW FROM A LATIN AMERICAN COUNTRY

Speaker: Mr. Gustavo Blanco Demarco, Assistant Director, Seeds Executive Unit, DIGRA, Ministry of Livestock, Agriculture and Fisheries, Uruguay

Chairman: Mr. José María Elena Rosselló, Head of Section, Register of Varieties, National Institute of Seeds and Nursery Plants, Spain

GENETIC RESOURCES AND PLANT BREEDERS' RIGHTS

"The educational reform, the royal Botanical Expedition and the Comunero Rebellion: this is the trilogy at the root of our citizenship. They are the events which, in our temperament and our political system, in the field of science and in our behavior, defined our personality; and they guided us through the epic times of the independence."[1] The connection between the national sentiment in Colombia and the botanical expedition organized under the leadership of José Celestino Mutis, which revealed the magnitude of the richness of that country's flora, is even cast in stone in the center of Santa Fé de Bogotá. To speak on genetic resources on this continent is therefore a privilege and a challenge.

The Seminar is also timely: being held a few months ahead of the United Nations Conference on Environment and Development (UNCED), which will take place from June 1 to 12, 1992, in Rio de Janeiro, it offers an opportunity to contribute to the debate on biodiversity and intellectual property from a pragmatic perspective.

However, it must be emphasized that many of the genetic resources issues are not subjects on which the International Union for the Protection of New Varieties of Plants has an established policy or position. Accordingly the discussion which follows represents, except where otherwise indicated, a purely personal view and should in no way be taken to represent the view of UPOV, of the UPOV Office or of the member States of UPOV.

The following points will be discussed:

(i) some basic elements on genetic resources;

(ii) the conservation of genetic resources and plant breeders' rights;

(iii) the use of genetic resources and intellectual property rights.

SOME BASIC ELEMENTS ON GENETIC RESOURCES

A Typology of Genetic Resources

According to FAO[2], 'biodiversity' means "the variety of the world's organisms, and the assemblages they form," assemblages presumably meaning ecosystems. The term 'genetic diversity' "covers all of biological diversity that is inheritable (including inter-specific and intra-specific variation, and a large part of ecosystem diversity)." And the term 'genetic resources' "is more specifically used to refer to that part of genetic diversity that is of actual or potential value."

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1 Belisario Betancur, in: E. Mendoza Varela, Regreso a la Expedición Botanica, Litografia Arco, Santa Fé de Bogotá, 1983 (foreword).

2 Document CPGR/91/9, submitted to the fourth session of the Commission on Plant Genetic Resources (15-19 April 1991): Biological Diversity and Plant Genetic Resources.

For 'germplasm,' we may quote R.W. Allard[3]: "the sum total of the hereditary materials in a species."

Those terms are frequently used in a lax manner and sometimes convey wrong impressions, whereby deliberate misuses are not rare. It is therefore necessary to recall on what scene genetic resources and plant breeders' rights interplay. In an economic perspective the following broad types of genetic resources can be distinguished:

- wild species;
- cultivated (domesticated) species and their wild relatives;
- man-made genetic elements.

Wild species

The purpose and objective of plant breeders' rights is to promote breeding activities, i.e. the creation of new varieties of plants, the very purpose of which is to be cultivated. Plant breeders' rights provide an exclusive right to the breeder which is strictly limited to commercial activities involving cultivation. It follows that there is no negative connection--in fact there is a positive one as will be shown below--between the part of biodiversity that comprises the wild species, and plant breeders' rights.

There are many million species on earth at present. The estimates vary in particular according to the notion of species that is retained. The International Union for the Conservation of Nature and Natural Resources (IUCN) has set its own to about 30. About 1.4 million only are known to man. Their distribution is extremely unequal: maximum diversity is to be found in the equatorial zone and moist and seasonal tropics, and minimum diversity, of course, in the inhospitable regions (hot or frozen deserts). The temperate zones are relatively poor as a result of the ice ages. Switzerland's flora (green plants) comprises for instance some 3 to 4,000 species according to the estimate published in a recent flora. According to the International Board for Plant Genetic Resources (IBPGR)[4], the United States of America has 18,000 plant species, Europe 12,000 and Mexico 30,000.

It follows from this that the countries that are well-endowed with biodiversity are few in number. A distinction between 'North' and 'South' does not appear justified because there is no correlation between biodiversity and economic development or membership in a particular grouping of States. In addition, the factor 'originality' should not be overlooked. Seen from the perspective of an inhabitant of the Northern Hemisphere, Australia and other parts of the former Gondwanaland in particular host a unique flora (whereas they have no natural diversity in agricultural crops).

Although the wild species are not the subject of this lecture, it should be mentioned that the conservation and use of the natural biodiversity raises a number of important issues. The destruction of natural biotopes, even on a limited scale in the lower latitudes, either because of their exploitation under a system of gathering or because of reclamation carries with it the risk

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3 Principles of Plant Breeding, John Wyley & Sons Ed., 1960, 485pp.

4 1991 Geneflow.

of species extinction. A balance must be found between the short-term need for mankind to ensure its well-being and the long-term need to preserve 'its' environment.

In this respect, the Republic of Costa Rica should be cited as a forerunner in the endeavors to find such a balance in cooperation with partners from all sectors.[5]

Cultivated (Domesticated) Species and Their Wild Relatives

Species Diversity.- The cultivated species represent only a fraction of the world flora, and the vast majority of them belong to the higher plants (Angiospermae). The Diccionario de Plantas Agricolas of Enrique Sánchez-Monge y Parellada[6], for instance, contains 3933 entries at species level. In addition, there are some dozens of cultivated forest trees and several thousands of ornamental plants.

Of course, the number of species on which man depends for his basic needs is much smaller. Fifteen species or groups of species (banana, barley, bean, cassava, coconut, maize, peanut, potato, rice, sorghum, soybean, sugar beet, sugar cane, wheat and yam) supply more than three quarters of the world food resources.[7] A comparison is sometimes made between the purported diversity of the diet of our ancestors and the alleged present-day uniformity of the products offered on supermarket shelves to suggest a reduction in the diversity of cultivated plants. This is far from true in both cases. Our ancestors depended heavily on a handful of staple crops; we still speak for instance of the civilizations of maize, rice or wheat. Most of the cultivated plants that fell into disuse have never played an important role because of their agronomic, culinary or gastronomic disadvantages. In any event, their disfavor--which does not imply that they have been lost--is in no way due to plant breeders' rights.

A few hundred only of the cultivated species are used in the form of varieties and are the subject of plant breeding activities. The others are used in the form of populations that have been subjected to no or little deliberate selection pressure; in that case, domestication is limited to the gathering and sowing or planting of propagating material.

A particular feature of the plant kingdom is that the barriers of sterility or reproductive incapacity which define the species can be trespassed naturally or with the help of methods such as diploidization, embryo rescue or somatic hybridization. Indeed a great number of cultivated species are the result of natural or artificial interspecific hybridizations. The first man-made hybrid is incidentally the Sweet William carnation created by Thomas

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5 See C. Joyce, Prospectors for Tropical Medicines - Tiny Costa Rica is taking control of its biological resources as it explores its forests for future medicines in partnership with the world's largest drugs company, New Scientist, 19 October 1991, pp. 36-40.

6 Published by the Spanish Ministry of Agriculture in 1981.

7 J.P. Gay, Fabuleux maïs - histoire et avenir d'une plante, Association générale (française) des producteurs de maïs ed., 1984, 293pp.

Fairchild in 1719. An increasing part of the breeding activities uses the loopholes of the species barriers to introduce into the gene pool of a cultivated species genes from their 'relatives,' whether wild or domesticated. This makes it relevant to consider the cultivated species and their wild relatives together. They are at the center of this lecture and represent the vast majority of the 'genetic resources' as defined by FAO in its document CPGR/91/9.

Intraspecific Diversity.- In its International Undertaking on Plant Genetic Resources,[8] FAO has also devised the following definition for the purposes of the Undertaking (Article 2.1(a)):

> "(a) 'plant genetic resources' means the reproductive or vegetative propagating material of the following categories of plants:
>
> (i) cultivated varieties (cultivars) in current use and newly developed varieties;
>
> (ii) obsolete cultivars;
>
> (iii) primitive cultivars (land races);
>
> (iv) wild and weed species, near relatives of cultivated varieties;
>
> (v) special genetic stocks (including elite and current breeders' lines and mutants)."

This classification is essentially based on the approach of conservation. In terms of use, the basic distinction should be between:

(i) genes (more correctly alleles) and

(ii) "balanced genetic structures,"[9] i.e. single genotypes in vegetatively propagated and self-pollinated crops and associations of genotypes such as populations, synthetic varieties, etc. (genotypes *sensu lato* according to A. Gallais[10]).

The 'Value' of the Intraspecific Diversity.- The 'value' of the genes in terms of plant breeding is obvious (the quotes are used here to indicate that the effect of the genes can be positive, negative or neutral); in economic

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8 Resolution 8/83 of the twenty-second session of the FAO Conferences, Rome, 5-23 November 1983. Its objective is as follows (Article 1):

> "1. The objective of this Undertaking is to ensure that plant genetic resources of economic and/or social interest, particularly for agriculture, will be explored, preserved, evaluated and made available for plant breeding and scientific purposes. This Undertaking is based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction."

9 André Cauderon, Plant Breeding: a Common Undertaking for Public Laboratories, Breeding Firms and Users of Varieties, in: The First Twenty-five Years of the International Convention for the Protection of New Varieties of Plants, UPOV publication No. 879(E), 1987, pp. 43-49.

10 Théorie de la sélection en amélioration des plantes, Masson ed., 1989, 588pp.

terms, a statement of the kind: "gene X has increased the value of the crop by Y million US dollars" is more debatable, however. Indeed, a gene has only value in a proper genetic environment, i.e., in a "balanced genetic structure."

How important such structures are can be examplified by the case of the introduction, by the University of Purdue in the United States of America, of the opaque 2 gene into maize to increase its lysine content and improve its nutritional value: not only were yields reduced by 15%, but also the grain became more brittle and pest-sensitive. It then took 25 years to the International Maize and Wheat Improvement Center (CIMMYT) to remedy these defects.[11]

Vegetative propagation enables highly heterozygous genotypes to be maintained true to type. In quite many species, the occurrence of a valuable genotype is a rare event; in the case of roses, for instance, the Meilland firm produces four to six marketed varieties out of 250,000 to 300,000 seeds resulting from the 5,000 to 8,000 crosses made every year.[12] In their case, it may be considered that the genotypes assume as much importance as the individual genes.

In addition to their direct value as carrier of the information which leads to the characters for which they are used in cultivation, genotypes are also the raw material for further breeding activities. Their value as genitors can be quantified scientifically in terms of combining ability, albeit in relative terms in view of the importance of the complementarity between the two parents of the cross. In economic terms, their individual contribution to the genetic progress seems very difficult to quantify, contrary to that of single genes. A major obstacle in this respect is the identification of genotypes involved. Fischbeck[13] for instance noted that the range of winter wheat varieties available on the German market in 1980 (about 40 varieties) was in its majority attributable in some way to recombinations between 'Derenburger Silber' x 'Heine VII' and 'Cappelle' x 'Carsten VIII.' He could as well have attributed the 'merit' of Cappelle to its parents, 'Hybride du Jonquois' and 'Vilmorin 27.'

Most characters relevant to the agronomic and technological value of a variety are under polygenic control. In a debate on the use of genetic resources which places emphasis on monogenes--this applies also to the possible future contribution of genetic engineering--it is essential to undeline the essential role of the genotypes.

Finally, the diversity of genotypes is valuable as a buffer--at least an insurance--against adverse conditions. In this respect, it is frequently assumed that genetic uniformity goes together with vulnerability. In addition to its ability to make the issue of plant breeders' rights emotional, this assumption has such a seductive simplicity that it is rare to find the word

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11 M. Rives, L'amélioration des plantes, in: La recherche sur la génétique et l'hérédité, Edition du Seuil, 1985, pp. 233-260.

12 W. Gfeller, The Program of the Celebration, in: The First Twenty-five Years of the International Convention for the Protection of New Varieties of Plants, op. cit., pp. 11-15.

13 The Usefulness of Genebanks - Perspectives for the Breeding of Plants, in: The Use of Genetic Resources in the Plant Kingdom, UPOV publication No. 336, 1981, pp. 15-26.

'vulnerability' without the adjective 'genetic.' The unfortunate examples such as the susceptibility of the maize hybrids based on Texas cytoplasm to Helminthosporium turcicum (which incidentally caused a loss of 'only' 15% of the harvest in the United States of America in 1970) or the inconsiderate extension of the 'Besostaja' wheat outside its original cultivation area (which incidentally is not relevant since the cause of the crop failure was not genetic) should not hide the fact that reality is much more complex. In short, genetic diversity does not prevent a whole species from being severely affected by a pest or disease (for instance the European elms by Ceratocystis ulmi), nor does genetic uniformity make whole stands automatically vulnerable (for instance, Elodea canadiensis reproduces only vegetatively in Europe).

Man-made Genetic Elements

A portion of the genetic resources of cultivated plants deserves singling out because of the high degree of human intervention. We shall call them 'man-made genetic elements.'

On the side of the genetic structures there are not only the interspecific hybrids, whether obtained through sexual or somatic hybridization, 'cybrids,' and polyploids that have found their way to the farmers' fields or remain a laboratory monster like the 'pomato.' These constitute in effect new species (the case of the polyploids being debatable). There are also the aneuploids and monoploids which have been so useful in increasing our knowledge of the genetics of the crop concerned.

On the side of the genes, the advent of applied molecular biology has enabled man to isolate genes, to create artificial gene constructs (in particular associations of coding sequences with foreign regulation sequences and vectors) and even to create artificial genes (for instance antisense genes). Part of these are for use in the biotechnological industry; the other part enriches the means available to the plant breeder. Progress in plant genetic engineering has been much slower than anticipated and mainly restricted to a few objectives such as pest, disease or herbicide resistance or the change of the composition of the oils produced by a crop; there are good reasons to believe, however, that with time the 'library' of genes and gene constructs kept in vitro--or even in the form of published DNA sequences--will increase.

The Distribution of Genetic Resources

Nicolai Ivanovitch Vavilov was a major contributor to our knowledge of the biogeography of cultivated crops. The plant explorations conducted by himself and his team for about 20 years, beginning in 1916, led him to define eight great centers of diversity: Abyssinia, Central America, west-central South America (Bolivia-Ecuador-Peru), central Asia, Asia Minor, China, Hindustan, Mediterranean Region. He postulated that the centers of origin of species coincide with the areas of greatest diversity, although he also recognized secondary centers of origin.[14]

The theories of Vavilov proved extremely fertile for plant exploration, genetic resources conservation and plant breeding. However, they were also

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14 According to R.W. Allard, op. cit.

drawn in the middle of a controversy on "the gene-rich and the gene-poor" into which the plant breeders' rights system was equally drawn.

This controversy ignores essential points.

(i) The centers of diversity are by definition rich in genes, and also in balanced genetic structures that are adapted to local conditions. But it cannot be inferred that they are as a consequence in a dominant position. On the contrary, "there is no country that is self-sufficient in indigenous germplasm for all its food crops. The free exchange of germplasm in that category is an essential geopolitical challenge."[15] According to FAO, "no country or region can be self-sufficient in its needs for plant genetic diversity. The average interdependence among all regions of the world is more than 50%."[16] Or "it is important to note that the Southern Hemisphere is by no means uniformly gene-rich. In the case of food crops and industrial plant species, there is no single region in either hemisphere that is completely independent in genetic resources. Consequently, free interchange of genetic material is a truly global issue; no region or country can afford to isolate itself. The free flow of material and know-how must be maintained at inter- as well as intra-hemispheral levels."[17]

According to Kloppenburg and Kleinman,[18] the dependence of Latin America, in terms of weight of the harvested products, from other centers of diversity is 55.5% for food crops and 72.1% for industrial crops. Laing also listed 28 species important for Colombia with an indication of the Colombian diversity. Sixteen were of foreign origin; native diversity was rated as moderate for potato, maize and beans, and high for orchids only. The commercial value of the crops for which Colombia has limited natural diversity represents approximately 90 % of the total commercial value of the national crop production.

(ii) It cannot be inferred either from the existence of centers of diversity that the other regions of cultivation are gene-poor. There are numerous examples of single genes found in such regions that have proved extremely valuable in the evolution of a crop. The most famous ones are probably the Norin 10 dwarfing gene and the Dee-gee-woo-gen gene for new plant architecture, which have been at the basis of the wheat and rice-based Green Revolution and were discovered in Japan and China, respectively.

The regions of cultivation are also rich in balanced genetic structures, and frequently in original and outstanding ones. This is due to various

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15 D. Laing, International Exchange of Germplasm in the World's Food Crops, Proceedings of the Second National Seed Symposium, Santa Fé de Bogotá, Colombia, FENALCE, 1991.

16 Document COAG/91/8 submitted to the eleventh session of the Committee on Agriculture: Biodiversity - Genetic Resources for Food and Agriculture.

17 C. Palmberg and J.T. Esquinas-Alcazar, The Role of the United Nations Agencies and Other International Organizations in the Conservation of Plant Genetic Resources, in: Forest Ecology Management, 35 (1990), pp. 171-197.

18 The Plant Germplasm Controversy, quoted by Laing, op. cit.

factors: crop plants have been shifted for millenia and adapted to local conditions, which sometimes implied drastic changes, in particular in respect of photoperiodism and adaptation to cooler climates. The latest major movement of crop plants, which followed the "discovery" of America, 499 years ago, shows how much diversity can be created or selected in a short period of time.

THE CONSERVATION OF GENETIC RESOURCES AND PLANT BREEDERS' RIGHTS

The Institutional Activities of UPOV: Indirect Involvement

The purpose of the UPOV Convention is to promote the recognition and grant by States of a right to the breeder of a new plant variety under uniform conditions, under the assumption that such rights are important not only for the development of agriculture in their territory but also for safeguarding the interests of breeders.[19] As an international organization, UPOV is not directly involved in genetic resources conservation activities.

The assumption is fully proven. The contribution of plant breeding to the development of agriculture is generally estimated as representing half of the yield increases in cereals in the agriculturally important UPOV member States, the other half being attributable to the improvement of crop husbandry. In many instances, all quality improvement is due to plant breeding alone. And as will be shown below, there are cases where the cultivation of a species is exclusively the result of breeding and associated work.

UPOV's field of competence thus covers in effect the use of genetic resources from the breeders' premises to the farmers' fields and further down to the consumer. It cannot therefore ignore the issue of conservation, which is at the very basis of plant breeding. Its activities are twofold:

(i) It creates awareness of the genetic resources conservation issue among the plant breeding circles at large (including the supervising national authorities). In particular, it has organized a symposium on the use of genetic resources in the plant kingdom in 1980[20] at a moment which was crucial for the European Cooperative Program for the Conservation and Exchange of Crop Genetic Resources (ECP/GR) supported financially by the United Nations Development Programme (UNDP) and scientifically by FAO.

(ii) It contributes to the work of other intergovernmental and non-governmental organizations, in particular FAO, UNCED, IBPGR, ECP/GR and the Keystone International Dialogue Series on Plant Genetic Resources. It regularly briefs the government representatives with whom it is in contact on developments in those fora, thus ensuring again awareness.

The Activities of Plant Breeders' Rights Offices

Some of the national plant breeders' rights offices serve at the same time as genetic resources centers and coordinators or advisers in genetic resources activities. In that case, involvement is direct.

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19 Article 1 and preamble of the 1961 and 1978 Acts of the Convention.

20 Records published in UPOV document 336.

Although this is not a requirement anchored in the Convention, most member States have made provisions to ensure that a sample of propagating material of the protected variety is either deposited in a gene bank (Australia and the United States of America in the case of sexually reproduced plants) or delivered to the plant breeders' rights office for the purpose of the official examination prior to the grant of the breeder's right. In the latter case, a part of the sample is stored for a longer period as a reference to be used in connection with the further examination activities or in the eventuality of an infringement proceeding in which a direct comparison has to be made between the representative sample of the variety and the material purported to be infringing. In practice therefore, many offices act as a repository for commercial varieties which are in use or have become obsolete.

The Conservation Activities of Breeders

The Paradox of Plant Breeding

Before addressing the links between plant breeding and genetic diversity in cultivated plants, it is essential to emphasize that there are many causes for the erosion of the genetic diversity of cultivated plants, some of which, like crop substitution, being very powerful.

"It was agreed that improved varieties--no matter whether they come from the public or private sector and are or are not protected by Plant Breeders' Rights--have the tendency to displace landraces and lead to a loss of genetic diversity. To the extent that PBR is intended as an incentive to develop improved varieties, it contributes indirectly to the loss of landrace genetic diversity."[21]

There is no doubt that this sentence has been carefully drafted and each word weighed. It recognizes the extraordinary difficulty of assessing the true nature and degree of correlation between the progress of plant breeding and the evolution of genetic diversity.

It is frequently assumed that the evolution of the diversity in the farmers' fields is characterized by a reduction, i.e. uniformization. This is not always true; it can very well happen that one type of diversity is replaced by another of equivalent or even greater magnitude. What we observe is therefore a change, and it is necessary to analyse the consequences of the change before drawing any conclusion. It also seems fair to deduce that the change in the ecosystem diversity results in an erosion of genotypic and genic diversity. If we are to be scientifically accurate again, we must admit that a genotype is only lost once the last specimen or minimum number of specimens has died out, and that the loss of a genotype does not necessarily imply that the last example of a particular allele has disappeared. The question is therefore an extremely difficult one.

Varietal improvement, which is an essential key to the improvement of agricultural production, leads in the first place to genetic substitutions

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21 Keystone International Dialogue Series on Plant Genetic Resources - Oslo Plenary Session - Final Consensus Report: Global Initiative for the Security and Sustainable Use of Plant Genetic Resources - Third Plenary Session, May 31-June 4, 1991, 43pp.

and, if not accompanied by appropriate measures, erosion. In other words, successful plant breeding tends to undermine its own foundations, the genetic diversity required for its sustained continuation.

It should be emphasized at this stage that this is the result of a series of events: first of all, a breeder, whether 'formal' or 'farmer-breeder'--to use the language of the Keystone report--must create a variety; secondly, the variety must be offered, whether by the seeds industry, the farmer-breeder or other suppliers; thirdly, the variety must be demanded by users, whereby the promotion by governmental extension services may be instrumental.

The Role of Plant Breeders and Plant Breeders' Rights

The breeders being the first in the chain, it is attractive to designate them as the primary cause of this evolution; however, their role is far from being negative.

If they are present or at least active in the region concerned, they monitor developments and remedy the negative aspects within the scope of their activities and functions; that is to say, genetic resources conservation will be based primarily on considerations of use and effectiveness in plant breeding. Such a policy has also been followed in the past by public institutions before the long term needs had been clearly identified and made into a matter of public policy.

The introduction of plant breeders' rights in various countries has demonstrated the ability of those rights to stimulate foreign breeders to set up activities or joint ventures in those countries and to stimulate national economic operators such as seed suppliers, producers and producers' cooperatives, and industrialists to become breeders.[22] In so far, the plant breeders' rights system directly offsets the negative impact of agricultural development on genetic resources. There are also a contrario examples of breeders closing their operations in a country because of the lack of protection or because of an erosion of their rights through extensive recourse to the 'farmer's privilege'.

The Activities of Plant Breeders

Indeed, plant breeders keep collections of germplasm, the very basic raw material for their activities. The ECP/GR Directory of European Institutions Holding Crop Genetic Resources Collections published in 1983 shows that private plant breeders sometimes hold quite considerable collections, comparable to those held by public institutions. In many countries, the public collections have also been established and are still maintained in connection with breeding programs.

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22 See for example P.W. Murphy, Plant Breeders' Rights and the Improvement of Plant Varieties, in: The Use of Genetic Resources in the Plant Kingdom, op. cit., pp. 27-34, and J.E. Veldhuyzen van Zanten and G. Erdély, The Role of Plant Breeders' Rights in the Transfer of Technology - I and L. Kálmán and M. Dickey, The Role of Plant Breeders' Rights in the Transfer of Technology - II, in: Seminar on the Nature of and Rationale for the Protection of Plant Varieties Under the UPOV Convention, Budapest, Hungary, September 19 to 21, 1990, UPOV Publication 697(E), pp. 97-99 and 101-108.

Breeders undertake, of course, all activities associated with such collections (collection expeditions, characterization and evaluation, etc.). In some cases, they have rescued the genetic resources that were threatened by major varietal changes such as the replacement of population varieties by hybrids.

The basic principle to be drawn from this is that a well-thought program for the improvement of agricultural production implies:

(i) the territorial expansion of improved varieties into the farmers' fields;

(ii) the territorial concentration of obsolete but still valuable germplasm in collections.

Plant breeders' rights play an essential role on both sides of the coin.

The Contribution of Breeders to the General Conservation Effort

The above-mentioned Directory also indicates that plant breeders are usually ready to make their collection accessions available to other institutions (which, in the context of the Directory, includes private breeders) on request and on an exchange basis. Of course, commercial interests will prevail in the relations with direct competitors, although the security offered by the plant breeders' rights system in the marketing of varieties contributes to the launching of joint ventures, for instance to the exchange of advanced breeder's lines for evaluation purposes.

In some instances, public collections have been assembled from material provided by private breeders.[23]

Breeders also contribute otherwise--and must contribute--to the general effort. "Evaluation strategy must advance from generalities to breeder-oriented specific objectives... This can only be done by the breeder in his own environment."[24]

Plant breeders' rights play an essential role in this by contributing to the creation of an environment favorable to breeding activities.

The Preservation Activities

Preserving Biotopes

Plant breeding also offers a major contribution to the preservation of biodiversity. "Farmers in India, for example, harvested 12 million tonnes of wheat from 14 million hectares in 1965. In 1990, they harvested 55 million tonnes from 23 million hectares. Forty million hectares of additional land would have been needed to harvest 55 million tonnes of wheat at the 1965 yield

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23 J.M.M. Engels, personal communication.

24 O.H. Frankel, Genetic Resources - Museum or Utility, in: Plant Breeding Symposium, Agronomy Society of New Zealand, Special Publication 5, 1986, pp. 3-7.

level. More forest land would have been lost to annual cropping had the yield improvement not taken place."[25] There can hardly be a more striking example.

Present-day commercial discussions at worldwide basis are dominated by the 'problem' of overproduction and surpluses. They of course ignore that billions of people struggle for a decent living and that not so long ago the few countries which have that 'problem' also had a problem of food scarcity. In a number of them, particularly in Europe, one of the means to control production is reforestation, i.e. the extension of biotopes which are closer to the original climax communities.

Preserving Species Through Domestication

Still in the area of wild biodiversity, breeders domesticate certain species and protect them from the danger of extinction through inconsiderate overexploitation in a gathering economy. At the same time, they add an economic value to the ecological value of the species. This is in particular the experience of New Zealand and Australia where this activity is playing an increasing role due to the existence of plant breeders' rights.

It should be noted that domestication is a long and arduous process which may take as much as 20 years.[26] Indeed the breeder must not only determine the optimal growing conditions, but also, in many cases, engineer the species in several respects to eliminate redhibitory factors.

Such domestication can also have the purpose of preserving another species. Israel, for instance, has extended protection to jojoba (Simmondsia chinensis (Link) Schneid.) to promote breeding activities which will hopefully stop whaling for the gathering of spermaceti.

In this connection it is important to highlight two essential features of the UPOV Convention.

(i) The plant breeders' rights system offers no protection at species level. In other terms, the breeder who has domesticated a species (or created a new species by interspecific sexual or somatic hybridization)--in practice by developing the first variety for cultivation--is only entitled to an exclusive right covering the variety. Another breeder may therefore freely undertake the same kind of activity or take the protected variety, under the 'breeder's exemption,' as a source of variation for further breeding activities. This 'exemption' is not unbearingly disadvantageous to the first breeder since he would be in a leading position for many years because of his technological advance.

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25 Keystone International Dialogue Series on Plant Genetic Resources, Third Plenary Session - Final Consensus Report: Global Initiative for the Security and Sustainable Use of Plant Genetic Resources, op. cit.

26 D.J. Murphy, Designer Oilseed Crops, Genetic Engineering of New Oilseed Crops for Edible and Non-edible Applications, Agro-food-industry Hi-tech, 1991, No. 5. (the statement was made in respect of Cuphea).

(ii) The plant breeders' rights system offers--unlike the patent system--protection for varieties that have been "discovered and developed."[27] The underlying principle is that this kind of activity is as useful and deserves as much protection as the activity which consists in crossing two plants and selecting a variety from among the progeny. There has been no single case--sometimes dubbed a theft of a genetic resource--of a mere discovery being exploited straight away as a (protected) variety.

Preserving Species From Pests and Diseases

Plant breeders contribute significantly to the protection of cultivated species against pests and diseases. In some cases, their contribution has been essential to the preservation of a species that was in danger, if not of extinction (since one can always imagine the preservation in pest- or disease-safe areas), at least of significant reduction. The first example of this was the salvation of the European grapevine (Vitis vinifera L.) from phylloxera, where the idea of using rootstocks of American origin had to be complemented by interspecific crossings to create an array of rootstocks adapted to the various growing conditions.

The work that is currently in progress on date palms (Phoenix dactylifera L.) to confer upon it resistance to 'Bayoud' (Fusarium oxysporum f. albedinis) is even vital for the preservation of whole ecosystems, the oasises, and of an original civilization.[28]

Continuous use of different genetic backgrounds in Australian wheat breeding programs has prevented rust epidemics for more than 30 years.[29]

The Creation Activities of Plant Breeders

Intraspecific Diversity

That breeders create intraspecific diversity--by recombining genotypes, provoking mutations and inserting alien genes by genetic engineering--does not need to be demonstrated. The table overleaf[30] shows the 10 species for which the number of protected varieties is the greatest in 6 countries.

These numbers are far greater than the numbers of varieties that are popular and grown on a large scale. The following information relating to France illustrates the point[31]:

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27 Article 1(iv) of the 1991 Act of the Convention.

28 Fascinating information on the subject is to be found in J. Semal, Pathologie des végétaux et géopolitique, La Maison rustique, 1982. The subtitle of the book is: a study of the interaction between the plant pathologic phenomena, the historical events and the evolution of customs, science and technology.

29 D. Laing, personal communication.

30 M. Tabata, Overview of Plant Variety Protection in the World, UPOV document UPOV/TSU/91/2.

31 From Cultivar No 306 (November 1 to 15, 1991).

Table 3: Most Protected Plant Species

Country	1	2	3	4	5	6	7	8	9	10
FRANCE (as of May 1, 1991)	Maize (720)	Chrysanthemum (502)	Rose (387)	Sunflower (186)	Pelargonium (184)	Soft Wheat (145)	Potato (133)	Barley (132)	French Bean (122)	Carnation (121)
GERMANY (as of Apr. 1, 1991)	Rose (428)	Chrysanthemum (268)	Maize (249)	Potato (170)	Perennial Ryegrass (152)	Zonal Pelargonium (148)	Barley (136)	Gerbera (102)	Carnation (93)	Saintpaulia (90)
JAPAN (as of (Dec. 5, 1990)	Rose (209)	Carnation (185)	Rice (141)	Chrysanthemum (112)	Cymbidium (97)	Common Stock (78)	Lily (71)	Shiitake (57)	Peach (55)	Citrus (54)
NETHERLANDS (as of Dec. 31, 1990)	Chrysanthemum (386)	Rose (335)	Lily (297)	Carnation (269)	Ryegrass (176)	Gerbera (166)	Potato (146)	Freesia (119)	Alstroemeria (116)	Bean (100)
UNITED KINGDOM (as of Dec. 31, 1990)	Rose (431)	Chrysanthemum (275)	Pea (including Field Pea) (122)	Potato (102)	Barley (100)	Pelargonium (86)	Perennial Ryegrass (70)	Wheat (64)	Swede Rape (40)	Alstroemeria (38)
UNITED STATES OF AMERICA* (as of Dec. 31, 1990)	Soybean (487)	Wheat (217)	Pea (194)	Cotton (175)	Maize (162)	Garden Bean (149)	Lettuce (85)	Alfalfa (71)	Perennial Ryegrass (68)	Tall Fescue (50)

* Only varieties protected under the Plant Variety Protection Act

- On May 1, 1991, there were 145 protected wheat varieties;
- The most popular variety was grown on 19.6% of the total area in wheat;
- The top five varieties occupied 57.9% of the area and the top 10, 71.9%;
- The fifth variety was grown on 5.2% of the area and the tenth, on 2.2%;
- The total area of wheat for the production of seed under multiplication contracts was 105,500 hectares. Sixty-six varieties were grown for seed on more than 100 hectares.

If one considers that there is genetic uniformity across the farmer's field, he must accept that it is not plant breeding that creates that uniformity, but the market conditions and in particular the users' choice.

In fact, plant breeding plays an essential role in two complementary directions:

(i) It creates the intravarietal genetic uniformity that is required for the optimization of agricultural production under modern crop husbandry methods and of use in the food and other plant-based industry.

(ii) It creates the intervarietal genetic diversity that is required for the same reason and for buffering the effects of adverse conditions. In this respect, the more breeders are at work, the more diversity may be expected.

To achieve this, breeders use all available technology of proven value and, in the case of breeding based on crosses, exploit three main avenues:

(i) crosses between (usually) the best varieties to produce still better ones, i.e. the efficiency of genetic recombinations, even within an extremely narrow genetic base, the price being a narrower intervarietal (intraspecific) genetic base;

(ii) crosses between locally adapted genotypes and foreign genotypes selected on the basis of good combining ability, which broadens the genetic base but usually requires work to restore the genetic balance, and in respect of which the interdependence of the various regions, including the centers of origin, must again be emphasized;

(iii) the introduction of valuable genes, which is sometimes easy, and sometimes very difficult because single genes may disrupt the genetic balance or may be linked to an unfavorable one which has to be eliminated through strenuous work.

Interspecific Diversity

Breeders both maintain and create interspecific diversity for the benefit of the agricultural ecosystems.

(i) Man-made interspecific hybrids, of which the latest successful example should be triticale (x Triticosecale Wittmack), become species in their own right, even if their Latin name is governed by special rules.

(ii) Breeders work on crop plants that have fallen into disuse for one reason or another or crop plants from other areas of the world to bring them up to the standards required by the various users (growers, industrialists, users) and give them a chance of finding a place among the plants that are effectively cultivated.

In this respect, the trend for agricultural diversification resulting from overproduction in some blessed regions of the world, from pressures towards a more environment-friendly agriculture and towards a more sustainable economic activity based on renewable rather than fossile raw materials and energy offers--worldwide--vast opportunities and great challenges for plant breeders.

THE USE OF GENETIC RESOURCES AND INTELLECTUAL PROPERTY RIGHTS

The Use of Genetic Resources and the UPOV Convention

This section of the paper describes the specific provisions of the UPOV Convention which touch upon genetic resources; it accordingly deals with matters for which there is a clear UPOV position.

The 1961 and 1978 Acts

The UPOV Convention does not provide for any kind of exclusive right over the variety as a genetic resource, with narrow exceptions applying to the exploitation of certain kinds of derived varieties.

The 1961 and 1978 Acts of the Convention specifically provide a 'breeder's exemption' in Article 5(3):

> "Authorisation by the breeder shall not be required either for the utilisation of the variety as an initial source of variation for the purpose of creating other varieties or for the marketing of such varieties..." (text of the 1978 Act).

Because the basic minimum right granted to the breeder was confined to the production for purposes of commercial marketing and to the marketing of the propagating material of the protected variety and because seed of inbred lines used as components of hybrids is usually not produced for such purposes and marketed, that Article goes on with the following exception:

> "... Such authorisation shall be required, however, when the repeated use of the variety is necessary for the commercial production of another variety."

The 1991 Act

The provisions defining the rights to be granted to the breeder are based on a completely new structure in the 1991 Act. Consequently, the 'breeder's exemption' had to be reformulated (Article 15(1)):

> "(1) [Compulsory exceptions] The breeder's right shall not extend to
>
> ...
>
> (iii) acts done for the purpose of breeding other varieties, and, except where the provisions of Article 14(5) apply, acts [to which the breeder's right applies] in respect of such other varieties."

The 1991 Act extends the rights to be granted to the breeder (which relate to acts of exploitation of certain material of the protected variety) in three cases. The text of the relevant provision (Article 14(5)) is as follows:

"(5) [Essentially derived and certain other varieties] (a) The provisions of paragraphs (1) to (4) shall also apply in relation to

(i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety,

(ii) varieties which are not clearly distinguishable in accordance with Article 7 from the protected variety and

(iii) varieties whose production requires the repeated use of the protected variety.

"(b) For the purposes of subparagraph (a)(i), a variety shall be deemed to be essentially derived from another variety ("the initial variety") when

(i) it is predominantly derived from the initial variety, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety,

(ii) it is clearly distinguishable from the initial variety and

(iii) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.

"(c) Essentially derived varieties may be obtained for example by the selection of a natural or induced mutant, or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, or transformation by genetic engineering."

This text takes over the former exception in relation to the repeated use of a variety and clarifies that the right also extends to material that is not sufficiently distinct from the material of the variety. In the normal operations of the plant varieties and seeds industry such material would not be considered as a variety on its own. The clarification was considered necessary, however, because this view is not always accepted.

As regards 'essentially derived varieties,' the main points of the new provision are as follows:

(i) The extension of the breeder's rights to an essentially derived variety only applies to the latter's exploitation. The creation of such a variety continues to be free. It is to be expected that--except in the case of natural mutants which can only be discovered--the terms under which an essentially derived variety to be created by a second breeder would be eventually exploited will be determined before the derivation work is actually started, in an agreement between the two breeders involved. Such agreements are already concluded today between 'traditional' breeders and 'genetic engineers' in the framework of partnership arrangements based on ordinary contract law.

(ii) The extension of the breeder's rights to an essentially derived variety only applies where the breeder has bred or discovered and developed an original genotype (as opposed to a variety that is essentially derived).

(iii) In the case of a chain of essentially derived varieties, the extended right will accrue to the breeder of the first variety in the chain, if it is protected and if the differences accumulated along the chain are still within the limits required for there to be essential derivation. The breeder of an intermediate variety has no right over later ones since he has not contributed the original genotype.

(iv) A variety is essentially derived if:

(a) its genetic constitution is drawn from a single variety with a minimal contribution from another source (for instance a gene inserted by genetic engineering) or with a minimal change (for instance a genic mutation);

(b) it is clearly different from the variety from which it derives, which implies that it may be the subject of a breeder's right;

(c) it is only different from the variety from which it derives to the extent caused by the act of derivation (the breeding method used).

(v) Because an essentially derived variety may be the subject of a breeder's right, its exploitation may be subject to two authorizations (licences). If it incorporates a patented gene, a third authorization might be necessary; it may be assumed that the latter will be negotiated--like the authorization of the breeder of the original variety--before the work to create the essentially derived variety is actually started.[32]

The provision on essentially derived varieties has been welcomed by the whole plant varieties and seeds industry (including the plant genetic engineering industry) as a major contribution towards equity as between breeders, on the one side, and as between breeders and genetic engineers, on the other.

The Use of Genetic Resources and the Patent System

Because the controversy over patent rights in relation to genetic resources has spilled over the plant breeders' rights system, it is appropriate to make some comments.

The Basic Principles of Patent Laws

Patent rights are available for an invention if:

(i) it is new, i.e. not anticipated by prior art, which usually comprises anything which has been disclosed to the public, anywhere in the world, by publication in tangible form or, in the country, by oral disclosure, by use or in any way[33];

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32 At the Conference on Protecting and Exploiting Biotechnological Inventions held in Brussels in November 1990, it was also suggested that the exploitation of the derived variety would be essentially subject to the rules of the plant breeders' rights system and that an attempt to override a limitation under that system (in particular a 'farmer's privilege') would be politically unsound.

33 Section 114(1) of the WIPO Model Law for Developing Countries on Inventions, Volume I (Patents), WIPO publication No. 840, 1979.

(ii) it involves an inventive step, i.e. not obvious to a person having ordinary skill in the art;

(iii) it is industrially applicable, i.e. can be made or used in any kind of industry, including agriculture.

A formal, yet important, additional condition is that the invention must be disclosed in a way which enables a person having ordinary skill in the art to evaluate it and carry it out. Deposits of biological material are usually accepted as a complement to the description.[34]

A further condition is that of unity of invention.

The right granted to the inventor relates to the exploitation of the invention, i.e., in the case of a product, basically to the making, selling and using of the product and, in the case of a process, to the using of the process and to the making (by means of the process), the selling and using of the product obtained directly by means of the process. The inventor has some degree of freedom in defining his invention in the form of claims. But "claims should reflect the real technical contribution. The generic scope should be a reasonable prediction from the technology carried out in the light of the known background, namely a scientific test depending upon the state of knowledge at the time."[35]

Tribunals may rescue the inventor through the doctrine of equivalents if he has used too much restraint. They may also sanction him with limitation of the claims or even invalidation if he has been presumptuous.

The Application of the Principles

The application of these principles to the field of the living raises considerable questions which have not yet been fully and definitely answered. It is difficult to discuss them on the basis of practical examples as this would impinge on private interests. It may be noted, however, that the general tendency of patent offices is to grant patents leaving to the courts the task of limiting or invalidating them.[36] Many claims, and even some claimed inventions, seem to us exagerated.

An additional difficulty is that many patent laws exclude plant and animal varieties, and also essentially biological processes for the production of plants and animals, through a specific provision from patentability. Our impression is that, in many cases, the administrative decisions thus far taken,

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34 Recently, the Supreme Court of Canada in Pioneer Hi-Bred Limited v. The Commissioner of Patents (14 C.P.R. (3d) 491) upheld the refusal to grant a patent on a soybean variety on the ground that the requirement of an enabling disclosure had not been met, despite the deposit and the eventual availability of the variety on the market.

35 A. Laird, A Corporate View of Biotechnological Inventions, in: Protecting and Exploiting Biotechnological Inventions, Worldwide Information, 1991, pp. 293-296.

36 A. Gallochat, Survey of Selected EPC Countries - France, in: Protecting and Exploiting Biotechnological Inventions, op. cit., pp. 65-68.

including at the appeal stage, were not directed to the true issue (does the application relate to an invention?) but rather to the exclusion provision when it was not really relevant. Similarly, some attempts to legislate this matter have been based on clearly one-sided opinions and consultations.[37]

This of course does not create a serene atmosphere for the debate on the issue of patenting life. Depending on one's basic approach to the issue, it has created false hopes and unjustified nightmares.

As far as the plant varieties and the genetic resources used in agriculture are concerned, the following may be assumed:

(i) Where plant varieties are not expressly excluded, they should only in rare cases be patentable, owing to the requirement of inventive step.

(ii) Where that requirement is fulfilled, it is so at the level of, e.g., a novel gene, or a gene construct, in which case the invention relates to that component (and the inventor would be foolish, first to wait until he has produced a commercial variety before filing a patent application and, second, to claim only that variety). Early filing will mean that the patent would have an effect--if any--in relation to the general public at a rather late stage.

(iii) Patents can undoubtedly be granted for products and processes used in plant breeding, in particular to truly man-made genes, to hybridization agents, to equipment used in plant breeding, to testing and screening material, reagents, processes, to genetic engineering processes, etc.

(iv) Where such patents are granted, it will be a delicate task for the inventor to draft suitable claims and to conclude appropriate licensing agreements. Exaggerated claims on the part of a genetic engineer will detract plant breeders from cooperating with him, to his own detriment.[38] In this respect, competition law must also be considered.

(v) An arbitrary limitation of the scope of a patent and of the contractual freedom might work against the user. For instance, it would not be sound to require that the inventor cash a single licence fee when making a patented gene available to a breeder, since the latter may not be able to breed a successful commercial variety.[39]

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37 See for instance M. Llewelyn, Future Prospects for Plant Breeders' Rights Within the European Community, [1989] 9 EIPR, pp. 303-310, in relation to the proposed EC Directive on the Legal Protection of Biotechnological Inventions.

38 In this respect, Laird, op. cit., notes that "it is accepted that the development of new plant varieties is important and should be encouraged and that getting the most from biotechnology requires the active cooperation of breeders, growers and biotechnologists, each contributing a different aspect at a different stage of development."

39 In this respect, A. Laird, op. cit., notes that "it is also likely that effective cooperation means that each contributor has to regard the balance of the contribution as against the reward as fair. A sound basis for such fair balance is to ensure that each contributor receives effective intellectual property protection, commensurate with their technical contribution and operating at the point of commercial return. In this way the negotiating position of each contributor is balanced on the basis of what they have done, not on their commercial strength."

(vi) There is no final ruling that a gene that has been isolated or a genetic construct will be patentable. With the progress of science and technology, many achievements, irrespective of the amount of time, money and skill that has been necessary, will be obvious and thus unpatentable.[40]

(vii) Where patents are allowed on recombinant genes, they will not cover the original gene in its natural form and surroundings.

(viii) Patents have only effect on the territories for which they have been granted.

It must also be recognized that a patent is granted against the disclosure of the invention. The alternative to them is the trade secret, at least until the invention (for instance the gene) must be made available to the public in the framework of the exploitation of the commercial variety incorporating it.

In addition to its role as reward for the inventor and tool for the dissemination of knowledge on and transfer of technology, the patent has important functions in the strategy of enterprises.

In comparison, the plant breeder's right plays a more modest--and yet essential--role in its own field, basically the varieties and seeds industry: it enables the breeder of a variety to obtain a reward for his achievement, commensurate to the commercial success of his variety, and to organize its exploitation, in general by a multiplicity of seed producers and farmers. Because of the features of the agricultural industry, it is exceptional that a plant breeder's right is used by its owner to retain the monopoly of the exploitation of the variety concerned; and still in that case, he would face the competition of the other protected and non-protected varieties. The creation of licensing societies such as ARPOV in Argentina testifies to this role.

Plant breeders' rights are an essential tool to promote plant breeding activities, which are vitally important for the future of our planet and of mankind.

The correlations between plant breeding and biodiversity that are negative cannot be ignored. It is essential to take corrective measures, both in the form of in situ and ex situ conservation, and to treat this as a global issue.

At the same time, the contribution of plant breeding to the conservation and development of biodiversity must be acknowledged and promoted.

The "technology-rich North versus gene-rich South" debate also overlooks the fact that, in the field of plant breeding, most of the 'technology' is well

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40 The English Court of Appeals decision in Genentech Inc. & Another v. Wellcome Foundation Ltd. gives some indications on the way in which the patentability in the field of living might be considered by courts. In particular, it rejected the idea of granting patents in respect of achievements through hard work and luck.

known and easily accessible. Some countries in Latin America have enjoyed an active and reputed breeding activity.[41] If there is a superiority to be found in the "North," it is mainly due:

(i) to a breeding tradition which goes frequently back to the preceding century;

(ii) to a demand for improved varieties, the genetic potential of the cultivated material having been identified as a limiting factor of agricultural production that needs appropriate attention;

(iii) to an economic and legal environment that promotes plant breeding.

The plant breeders' rights system is a major contributor to this environment. Some countries in Latin America, in particular our host of the day, have recognized this as early as 1973. Their intention to join UPOV to make it still more powerful should convince the others of its value.

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41 See for example A. Grobman, Plant Breeding in Latin America, in: Induced Mutations and Plant Improvement, International Atomic Energy Agency, 1972, pp. 29-40, and M.B. Gutierrez, La experiencia Argentina en la proteccion juridica de la propriedad de las variedades de plantas, Proceedings of the Second National Seed Symposium, Santa Fé de Bogotá, Colombia, FENALCE, 1991.

THE ARGENTINE SYSTEM OF PLANT VARIETY PROTECTION

I. INTRODUCTION

Agriculture has long been one of the prime movers in the Argentine economy, while plant breeding has kept farmers constantly supplied with varieties that perform well in local conditions and offer better yields, pest and disease resistance, industrial quality and adaptability to production systems. While better crop management has much to do with the improved yields and better quality of the end product, the main contributory factor is plant variety research and development.

In recognition of the amount of time and economic resources that breeders have expended, Law 20.247 on Seed and Phytogenetic Creations has accorded them intellectual property rights in new plant varieties since 1973.

By virtue of the rights conferred on him by the Law, the breeder exercises ownership rights in the propagating material of his variety for a period of up to 20 years. As a result, according to Decree No. 2183/91, the breeder's authorization is necessary for the variety to be produced or reproduced, conditioned or stored with a view to propagation, offered for sale, sold, exchanged, exported, imported, advertised or otherwise handled for whatever purpose. To qualify for that protection, the variety has to be new, distinct, uniform and stable. The Law and the new Regulatory Decree provide for a number of exceptions to the right of ownership:

(i) A researcher may develop a new variety from a protected variety and qualify for a property title without authorization from the original breeder if, in addition to being new, that variety is distinct, uniform and stable.

(ii) A farmer may freely reproduce the protected variety on his farm, for his own use, again without authorization from the breeder.

(iii) In addition the State, faced with an emergency, may declare the protected variety to be in the public interest. In such cases there is provision for equitable remuneration for the breeder.

Smooth interaction between agriculture, new varieties and plant breeders' rights is thus ensured.

Without proper recognition of the intellectual property rights in new plant varieties, there can be no progress in plant breeding research and development. And there can be no progress in commercial agriculture without new plant varieties.

If we are to analyze the foundation and nature of the intellectual property rights in new varieties of plants in Argentina, we have first to place that analysis in a broader context in order to understand it better.

II. AREA OF REFERENCE

Throughout the present century, and more specifically in the last ten years, we have witnessed a great many political and also market changes, both in our country and elsewhere in the world. Those changes have brought about a succession of very different situations at grassroots level. With the globalization of markets, the segmentation of demand and the sheer diversity of supply, there is a very lively and competitive market for agricultural and agro-industrial products. Research and development has been one of the driving forces in this process, and the importance of intellectual property to the attribution of the results achieved is crucial, as we have seen from the current Uruguay Round of GATT trade negotiations.

It is for that reason that all new situations are constantly analyzed with a view to adapting the legal, technical and administrative arrangements concerning intellectual property and quality. As a result of our critical analysis of the situations, we review our provisions and adapt them as necessary to market requirements, without losing sight of the main objective, which is to defend the interests of our agriculture and farmers.

In order to understand better the various objectives that we set ourselves at various times, and the solutions that we arrive at, I intend to explain briefly how we watch the various situations evolve and describe certain trends that we consider significant.

(i) First there is the clear tendency observed on markets for agricultural and agro-industrial goods not to be likened to commodities, as they used to be. At present the goods are offered as distinct, high-quality products with built-in technology. They do not cater to a uniform, consistent demand either, but rather to a segmented demand from markets that require different goods, and from consumers who prove willing to pay higher prices for such products as will satisfy their specific needs. It is interesting to note that the interplay of supply and demand is taking place in a complex and competitive globalized market. Nowadays competitiveness is a question not merely of quality and price, but also of political, economic, social and legal stability. Competitiveness likewise has to do with a complex set of corporate alliances and regional agreements like Mercosur.

(ii) The other tendency that we consider significant is that of Argentina's reintegration in the world market. At the beginning of this century and up to the 1930s, Argentina experienced an explosion of economic, social and cultural growth, so the liberal, agro-export model fitted well into the specific circumstances of the world market of the time. The period that followed was characterized by the replacement of imports, and a relative slump in agriculture. Exports and imports were only tenuously linked to the world market, and domestic regulations created a model of introverted growth, which proved an ineffectual, and ultimately uncompetitive, means of generating and accumulating wealth.

At present Argentine society is undergoing a process of profound change. Political and economic stability, deregulation, market openness, regional alliances, private initiative and legal security for the investor are the salient features of the process, which will eventually bring about better integration in the world market and make for greater competitiveness.

(iii) The present Administration has brought about this social change by effecting a change in the role of the State, which used to participate directly in important areas of the economy and control innumerable daily activities.

The process of reforming the State takes place in various fields: State companies are being privatized and economic activity is being deregulated. Undelegatable State activities will be modernized and restructured, with the emphasis on decentralization to provinces and communes and also on deregulation, with delegatable activities being transferred to the private sector.

The Secretariat of Agriculture, Livestock and Fisheries (SAGYP), and specifically its seeds department, has been closely associated with this process from the outset.

III. THE SEED TRADE, NEW VARIETIES AND INTELLECTUAL PROPERTY

The changes in markets and in Argentina's presence on those markets and also the new role of the State provide the area of reference for the subjects that we are now going to consider, namely agricultural and livestock business, the seed trade and the legal provisions that govern the latter.

(i) With regard to agricultural and livestock business conducted by Argentine entrepreneurs and farmers, while traditional methods continue to be used, increasing interest is being shown in new kinds of business and new ways of doing the traditional kind. New plant varieties suited to the new demands of consumers play an important part here; the new, diversified agriculture calls for the constant renewal of varieties so that it can adapt to changing circumstances in markets and production systems. The new varieties are the product of research done both locally and in other countries.

(ii) The development of new varieties was an important activity carried on by the State, through the Ministry of Agriculture and Animal Husbandry (MAG) from its inception until the middle of the present century.

The National Institute of Agricultural and Livestock Technology (INTA) carries on this tradition, breeding a great many varieties in more than 30 species. There has also been private breeding activity at the national level ever since plant breeding began, and good results have been achieved for instance with wheat, sunflower and maize varieties.

As in many parts of the world, research on new varieties started in the hands of the State, but the work has since been gradually taken over by private enterprise. The advent of maize, sorghum and sunflower hybrids is essentially attributable to the foreign companies that settled in Argentina at the end of the 1950s and the start of the 1960s. INTA and the MAG were very much involved in the development of the first maize hybrids, and at present INTA leads the field in winter cereals, fodder plants and vegetables. Private initiative shares in the development of winter cereals, while it is less important in other areas and frankly dominates the sunflower, maize and sorghum hybrid and soya markets.

The advent of private capital in plant variety research and development, and the funding requirements of public-sector research bodies caused by the high cost of the research in question, led to the discussion, at the beginning of the 1960s, of intellectual property rights in relation to new varieties of plants. This culminated in Law 20.247.

So we can repeat here what we said at the beginning about the smooth interaction between modern agriculture, new varieties and their protection.

(iii) To conclude on this point, we shall comment briefly on certain aspects of intellectual property in our country, and elsewhere in the world, in terms of plant varieties.

Early legislation in Argentina recognized intellectual property rights in new discoveries or inventions in all forms of industry, conferring on the makers of those discoveries or inventions a title known as a patent.

Law 111 of October 11, 1864, shows that, although pharmaceutical compounds were not patentable, it had already been recognized that our legislation had to protect the moral or material rights deriving from research and development findings.

Mendel's work on plant genetics marked the beginning of the systematic breeding of plant varieties, succeding to old, empirical methods handed down by the early farmers.

This plant breeding work soon received recognition in the Papal edict of 1833, which granted the creator property rights in his new variety. It was however much more recently, in 1930, that the Plant Patent Act of the United States of America provided for the grant of patents for the protection of new plant varieties.

This is the route along which French, Belgian, German, Dutch, Italian and other legislation has since been led.

In Argentina, important plant breeding work was going on in the early 1930s, especially on wheat, maize and sunflower. There was for instance a group of people connected with plant breeding, including in particular the specialist Kugler, who explored with legislators the possibility of enacting a law similar to the American one for the protection of new plant varieties. This exercise did not succeed, but, in Seeds Law, 12.253 of October 5, 1935, we detect in the chapter entitled "Promotion of Genetics" a degree of recognition of plant breeders. The text in question provided for the provisional recording of the new variety in official registers for three years pending final registration. During those three years only the breeder could exploit the new variety, and in that way was enabled to recoup some of the funds invested in research and development.

Between the 1930s and 1960, there were discussions in Europe among plant breeders, lawmakers and groups connected with intellectual property on the machinery that would be most suitable for the protection of new plant varieties.

Patents were being experimented with in a number of countries, but the patentability requirements, namely absolute novelty, industrial applicability, sufficient description and inventive step were not always suited to the nature of plant breeding and varieties.

Breeders moreover considered that the patent would hamper the use of protected varieties as a source of genetic variation.

Farmers too expressed misgivings, as the patent and the extent of protection that it afforded might affect established customs and practices, like the very widespread practice of reserving seed for one's own use.

As a result of these difficulties, a number of European countries investigated the option of a specific property title that would balance the inter-

ests of breeders and farmers and be better suited to breeding practices and plant varieties.

These efforts eventually resulted in the creation of breeders' rights in Paris in 1961, with the signature of the International Convention for the Protection of New Varieties of Plants.

The first countries to sign the new Convention were Belgium, France, Germany, Italy and the Netherlands. They were followed in the following year by Denmark, the United Kingdom and Switzerland.

The resulting breeders' rights were written into the legislation of other countries, such as the United States of America in 1970 and Argentina in 1973. Other countries of Latin America, such as Uruguay and Chile, likewise took this course somewhat later.

Law 20.247 and its successive implementing decrees, 1995/78 and 50/89, incorporated most of the substantive provisions of the UPOV Convention of 1961 and the 1978 revised text. However, there was a lack of strong support in Argentina for actual accession to the Convention.

In recent years both INTA and the private firms grouped within the Argentine Seed Association (ASA) have been showing increasing interest in breeders' rights, and also in the possibility of Argentina acceding to the UPOV Convention.

An in-depth debate produced a preliminary draft implementing decree, which was approved by the National Seed Commission (CONASE) and transmitted to the National Executive Power (P.E.N.) for signature. This text eventually went on record as No. 2183/91 on October 21, 1991. On October 24, 1991, the Law and the new implementing decree were submitted to the Consultative Committee of UPOV for consideration. On the following day they were considered by the Council, and on October 26, 1991, the Council passed a resolution that found the Argentine legislation to be in conformity with the provisions of the Convention. It made recommendations regarding two articles of the Law, namely Article 22 on the term of protection and Article 26 on national treatment, which will be taken into account when the UPOV Convention is written into the law of accession, which the P.E.N. will shortly be submitting to Congress.

IV. SEEDS LAW 20.247/73, REGULATORY DECREES 1995/78 AND 50/89 AND THE SEED TRADE

The purpose of the present Law 20.247 on Seeds and Phytogenetic Creations and its first Regulatory Decree 1995/78, to quote the law's own Article 1 "is to promote efficient activities in the production and marketing of seed, to provide agricultural farm producers with a guarantee of the identity and quality of the seed they acquire and to protect property in phytogenetic creations." The text moreover creates the National Seed Commission (CONASE), the advisory body of the MAG, composed of ten members, five of them representing the State and five the private sector, including two for seed users, one for seed traders, one for seed producers and one for breeders. It also puts into operation the National Seed Service (SENASE), which is the implementing authority for the Law in question. The functions of SENASE are to deal with the ownership, certification and quality of seed and phytogenetic creations, and to exercise police authority over the genetic integrity and physical and

physiological quality of any plant material intended or used for sowing, plantation or propagation. It does that by keeping the National Register of Cultivars, the National Register of Cultivar Ownership, the National Register of Seed Trade and Supervision, the Official Board of Comparative Testing and the Central Seed Testing Station, assisted in this by CONASE.

Law 20.247 is therefore a legal instrument with two clearly differentiated areas of concern. On the one hand it is a law on "property" as it provides for the grant of titles of ownership to the breeders of new plant varieties, and on the other hand it is included among what are known as seed laws, in that it enacts a set of provisions to ensure the genetic identity and quality of seed.

The "seeds" part has its origins in the old Seeds Law, No. 12.253/35, Articles 22 to 27 of which, entitled "Promotion of Genetics," laid the foundations and provided the legal resources for the "tidying up" of existing varieties, the overseeing of the release of new varieties and the organization of the technical and administrative machinery for the supervision of the production of select seed that should reach the farmer with the maximum guarantees of quality. A registration requirement has been introduced for new cultivars, for which purpose their industrial quality, their good performance, their disease resistance and their yield potential will have to be assessed.

The 1935 Seeds Law was intended to lend uniformity to the country's seed trade. The chapter on the promotion of genetics was included to solve a serious problem facing Argentine wheat on the world market at the beginning of the 1930s; more than 60% of the production was of soft or semi-soft varieties. The provisions written into the 1935 Law enabled wheat research, new wheat varieties and wheat production to be channelled towards hard or semi-hard wheats, which were required by European countries as correctors.

In order to meet these objectives, the law created the Certification Board, the body with private-sector participation that was the precursor of CONASE. Its role was to give advice and raise standards, so in effect it was the governing body of the whole certification system.

The Seeds Division, the forerunner of SENASE, was the executive body of the certification system.

Registration qualifications were assessed by the Certification Board during three years of tests. If the variety was approved, there was a three-year period of provisional registration, during which tests continued in various areas covered by the Official Board of Field Testing. Thereupon the variety was granted final registration and entered the certification system.

While the sale of uncertified seed was in fact prohibited, there was a thriving illegal "brown bag" market.

Law 12.253 owed its origin to the confusion in the wheat market and in the distribution of material that was not suitable in industrial terms. Its implementation brought about a substantial improvement in the variety situation.

Law 20.247 introduces an important new notion in that it regards seed and phytogenetic creations as commodities susceptible of appropriation, which is why the State grants titles of ownership for them.

The Law in force likewise seeks to create a favorable climate for the satisfactory conduct of seed business.

While it removes conditions for the registration of varieties, reducing them to novelty, distinctness, uniformity and stability, it retains the authority to exercise police powers, and introduces a certification system of optional character. The mandatory identification of all seed in circulation on the market is retained, and the "identified" category is created. The introduction of this category was an attempt to wipe out the illegal "brown bag" market. With "identified" seed the identifier takes responsibilty, evidenced by a label, for the seed that he identifies. This procedure is not supervised by the State.

The State's police powers work in two directions, namely the publicizing of the Law and the punishment of infringers.

The police powers make it possible to circumscribe the brown-bag market with the aid of the provisions in force. This illegal market prejudices the breeder's right to earn royalties and the farmer's right to top-quality seed, and exposes the trader to unfair competition from the illegal operators. The brown-bag market moreover allows municipal, provincial and national taxes to be evaded. The cost of VAT evasion made possible by brown-bag transactions exceeds 40 million dollars a year.

A comparative analysis of the various texts, namely Law 12.253, Law 20.247 and the successive Regulatory Decrees, 1995/78, 50/89 and 2183/91, reveals a steady process of deregulation and decentralization. The latest Decree, like its predecessor, provides for many activities hitherto performed by the State to be taken over by provincial and municipal authorities. Many activities may even be delegated to the private sector.

Law 20.247 extends property titles to all botanical species. It grants a protection period of ten to 20 years: Decree 1995/78 provided for 12 years for annual species, 15 years for biennial and 20 for perennial. Decree 50/89 allows 20 years for vines and forest, fruit and ornamental trees and 15 years for other genera and species. Decree 2183/91 provides for maximum 20-year periods, with the possibility of granting shorter ones. In practice, no titles are granted for less than 15 years, and the implementing authority intends to extend protection to 20 years, which is in line with the prevailing world trend.

The State grants the property title, but it is the private sector that has to enforce the rights and obligations deriving from the title in its various areas of competence. As for the payment of royalties, it is a totally deregulated activity governed by market forces.

V. TITLES OF OWNERSHIP AND THE SEED TRADE

Since its creation in 1981, the National Register of Cultivar Ownership has granted 339 ownership titles. While the Law covers all botanical species, the range of titles granted actually covers 45.

If we analyse the titles by species, we notice soya with 25%, wheat with 22%, alfalfa with 8%, various fodder grasses with 10%, potato with 5%, and tomato, flax and maize varieties with 3% each. The current range of protected species includes winter and summer cereals, fodder crops and vegetable and fruit species; no protection has been sought for ornamentals.

With regard to origin, 35% of titles have been granted to INTA, the largest individual breeder, and 39% to private firms for national varieties. As for foreign varieties, branches of foreign firms account for 9% and foreign firms not based in the country, which have applied for registration through a legal representative, for 17%.

With all species the most important thing is the proportion of national varieties. The only foreign varieties of relative importance on account of their numbers are varieties of alfalfa, soya and potato.

The application for registration at the Register of Ownership requires only that the variety be new, distinct, uniform and stable. The basis for novelty and the description of the variety are provided by the breeder and have the character of a sworn statement. Information also has to be provided on the means of maintaining trueness to variety. The State undertakes a computerized comparative analysis of the new variety with existing varieties in the light of the literature submitted. Before the title is granted, CONASE steps in.

The system has operated well, and as yet no opposition has been filed during the 30 days of publication of the application in the main national newspapers.

For the moment the grant of titles is relatively up to date: there are just 124 titles pending. It should be explained that, of those, 100 are parent lines of sunflower, sorghum and maize hybrids. The newness of the latter is a cause of delays, as the programs have not yet been devised for the comparison work. So far the lines have been differentiated, and the pending titles are expected to be granted within a few months.

The Law does not mention any express prohibition on the grant of titles of ownership in respect of hybrids, unlike previous regulatory decrees, which were specific on the subject. Decree 2183/91 declares the legislator's intention, and the possibility of applying for such titles does exist. The breeder of a hybrid may apply for protection for the parent lines and for the hybrid, or, if he prefers, he can protect his variety as an "industrial secret." The private sector could from 1959 onwards apply to the National Register of Cultivars for the registration of hybrids as "closed pedigrees." INTA has adopted the same approach in recent years.

In the past, INTA lines were public. The present position of INTA, which favors breeders' rights and promotes mixed research and development undertakings through its Technology Coupling Unit, reflects the State's change of attitude towards plant breeding. We have come a long way since 1947, when the Ministry of Agriculture propagated seed and sold it to farmers.

Today plant varieties are the product of market forces; either they are developed by the private sector or by INTA alone or in joint undertakings, and the latter collect royalties like any private breeder.

New varieties, intellectual property and modern agriculture are thus interrelated, as we have already mentioned.

VI. THE NEW DECREE 2183/91: TRANSFORMATION OF SENASE INTO INASE AND THE SEED TRADE

To start with we will comment on how the world market tends to favor differentiated agricultural and agro-industrial products. We shall also show how the development of new plant varieties is necessary to meet the demands of farmers and consumers.

In recent years the high cost of developing new products and the strong presence of private enterprise have placed intellectual property at the focal point of business dealings and the provisions in force.

Argentina has been a member of the International Seed Testing Association (ISTA) since 1925, and has granted orange, green and blue certificates since 1981.

Argentina has also been party to the OECD certification system since 1982.

Argentina thus has national legislation that conforms to international standards. It is moreover present, with membership status, in international gatherings where such standards are worked out and harmonized. With regard to the certification of genetic identity and the physical and physiological quality of seed, Argentina fulfils the requirements imposed by the world market, and thus can export and import without infringing the rules of the game.

With regard to the third important aspect of the seed business, namely intellectual property, the position was different in the middle of 1989.

At that time Argentina granted property titles in respect of new varieties of plants, but it had not signed the UPOV Convention and was not a member of the international forum within which the relevant standards are developed and harmonized.

The need to adopt those standards and accede to the Convention was made clear by INTA and by private firms associated with ASA. The SAGYP closely followed the matter from 1989 to 1991, considering it important to Argentina's reintegration in the world market that assurances should be given to those who invested in the development of new varieties.

The new Regulatory Decree conforms technically to the UPOV Convention of 1978. Accession to the International Convention will enable us to participate fully in the drafting and harmonization of the various provisions on intellectual property rights in relation to new plant varieties.

This situation will enable us not only to complete our provisions and adapt to the various international standards, but also to receive technical cooperation from the UPOV Office and member States with a view to deciding on the new options made available in respect of the grant of property titles for newly developed varieties.

This will lend strength to the present legal provisions governing the intellectual property rights in new plant varieties.

Decree 2183/91 clearly specifies the scope of the breeder's rights and also the farmer's right to keep back seed for his own use. Moreover, with the police powers, it improves the means whereby the various sectors may enforce their rights.

In this connection the move to deal with unidentified and unlabelled seed in the provisions in force is very important. The existence of the brown-bag market exposes the rights granted by the Law to the risk of violation.

The new Decree likewise provides for the continuation of the process of deregulation and decentralization of State activities.

The deregulation and State reform put in hand by the present Administration, which is in line with the trend mentioned at the beginning, has been strictly confined to the provisions on seeds and to the future implementing authority, the National Seeds Institute (INASE).

INASE emerged from the transformation of SENASE.

In INASE the role of the implementing authority is strengthened by modernization and restructuring. It is now a decentralized agency of the SAGYP and financially self-supporting: it draws its funding from the payment of fees for services actually rendered.

It will be administered by a Directorate with equal State and private participation. The private-sector membership is composed of representatives of breeders, traders, seed producers and users.

INASE is coming into being in the midst of the process of State reform and deregulation, which is why it provides on the one hand for the decentralization to the provinces and municipalities of a range of State activities that cannot be delegated, and on the other hand for the deregulation of its activity, by the moving to the private sector, of functions that can be delegated.

INASE will take care of all questions of ownership and seed certification and quality. It will take part in the various international gatherings where the provisions mentioned earlier are drawn up and harmonized, namely UPOV, OECD and ISTA. It will be the implementing authority of the current Seeds Law. CONASE, as provided in the Law, will continue to carry out its advisory function at the level of the SAGYP. The various technical committees of CONASE--winter cereals, spring cereals, fodder crops, oil-bearing crops, potatoes, etc.--will in future carry on their activities under the aegis of INASE.

For INASE to contend effectively with the high degree of technical specialization required for the grant of property titles and international certificates, it will be provided with technical and professional resources in keeping with the progress made in plant breeding.

Police powers will be directed towards bringing the provisions in force to bear on the brown-bag trade, which, as has been frequently mentioned already, facilitates the violation of rights, especially in varieties of self-pollinating species.

The creation of the Argentine Association for the Protection of New Plant Varieties (ARPOV), with the participation of private breeders and the public sector, will make it possible to assert breeders' rights. The State grants the titles and the action of the private sector gives the rights practical validity by defending the breeders' interests.

VII. BIOTECHNOLOGY, PATENTS AND THE 1991 UPOV CONVENTION

We shall conclude with a brief analysis of the interplay of new plant varieties, biotechnology and intellectual property.

The advent of genetic engineering as a breakthrough in plant breeding that will benefit the creation of new varieties has aroused great interest not only among breeders but also among farmers, who show renewed confidence that the new varieties will enable them to bring out better-quality products in greater quantities, and so to cater for new markets or offer better production patterns.

By way of example, SENASE and the National Commission for Agricultural and Livestock Biotechnology are considering the possibility of allowing the testing within the country of transgenic material produced by genetic engineering (one cotton, one soya and one maize). The maize has the novel feature of fixing atmospheric nitrogen, while the soya is resistant to glyphosate, and cotton to bromoxinyl. The maize and cotton were submitted by representatives of foreign companies, and the soya by an Argentine company under a technology transfer agreement with a foreign firm. For these transgenic varieties, certain biosecurity requirements are added to the usual criteria of novelty, distinctness, uniformity and stability in order to ensure that the introduction of the varieties does not present any kind of risk to the environment.

These new creations, which are already on the way to the market, have revived the discussion on what would be the most appropriate means of protecting them, in view of the high research and development cost involved.

Various international gatherings have concerned themselves with these subjects. While the high costs have caused a number of groups to look on the patent system as an effective solution, the requirements of patentability were found hard to meet with biotechnological subject matter. Indeed the novelty condition is likely to be often impossible to meet. The deposit of micro-organisms overcame these problems, but there remain the problems of absolute novelty and inventive step, which were still difficult to solve.

Difficulties also arose with the patentability requirements in the specific case of new plant varieties, and especially the requirements of absolute novelty and inventive step.

A number of countries have legislation that permits the patenting of new plant varieties, for instance Australia, Japan and the United States of America. In the case of Australia, faced with the two alternatives of patents and breeders' property titles, the latter was clearly preferred by the breeders themselves. Hundreds of property titles and only 17 patents have been granted since the two forms of protection became available.

Article 53(b) of the European Patent Convention prohibits the patenting of new plant varieties and animal breeds.

As a a result of these difficulties, the 1978 Convention was revised in order to strengthen breeders' rights and thereby have an appropriate legal instrument to keep pace with the progress made in biotechnology and plant breeding.

The new UPOV Convention of 1991 strengthens breeders' rights from the point of view of the subject matter of protection, namely propagating material.

The Convention protects propagating material as such; it allows action to be taken on harvested material when the breeder has not been able to exercise his rights in relation to the propagating material and has inferred the latter's use from the harvested material, his action being based not on the harvested material but rather on the propagating material that he assumes, on the basis of the harvested material, to have been used without his authorization. The same thing happens in the case of material produced directly on an industrial scale, which the signatories can introduce as an optional provision.

The Convention makes no provision for the breeder to collect royalties for the flour or the bread roll produced using his wheat variety. What the Convention does do is allow the breeder of a vine variety, for instance, who has sold a vine shoot to a wine grower or wine trader, to claim royalties for propagation done without authorization if he observes that the grape or vine production on the market exceeds that of the single plant that he has sold. From the products on the market it can be inferred just how many illegal propagations the wine grower has made, and according to that finding royalties can be collected for the propagating material, but never for the grapes harvested or the wine produced.

Another interesting point worth mentioning is that the Convention expressly retains the possibility for signatories to retain in their national legislation the option of exempting farmers who produce seed for their own use on their farms from the necessity of seeking the breeder's authorization before doing so.

Finally, it includes the concept of the essentially derived variety within the scope of protection. This enables the breeder of an initial variety to collect royalties from the breeder of a variety "essentially derived" from the original one.

This point is worthy of careful consideration by those who are associated with plant breeding in countries like ours.

The process whereby a gene is produced that alters an important characteristic is a costly biotechnological process that is often beyond the means of local plant breeders. What that means is that many achievements in this area are probably made by important research centers or firms in more advanced countries. In practical terms, the genes in themselves do not produce any economic result. Only if they are present in a suitable local variety can they express the characteristic concerned. The creation of varieties suited to particular environments thus takes on particular importance.

The present Argentine Law and the 1978 UPOV Convention allow a biotechnologist to include a gene in an existing variety that is adapted to local conditions without owing any royalty to the breeder of the variety.

The UPOV Convention of 1991, because it draws the essentially derived variety concept into its area of protection, enables the breeder of the local variety actually to collect royalties or enter into a cross-licensing contract.

There is no need to explain here the important interaction of variety and environment; often just a few kilometers of distance or a few meters of altitude above sea level make it necessary to change varieties for want of adaptability. From this stems the importance of local breeding, and hence the interesting possibility of legally protecting such local breeding that the new 1991 Convention has introduced.

The new Convention will enter into force in three years at the earliest, as all the countries have to adapt their legislation. This gives us time to conduct a debate in our individual countries to determine how our interests will fare in the face of this new legal option.

Finally I shall refer briefly to the situation regarding patents and biotechnology. Patent Law No. 111 of 1864 defines new discoveries or industrial goods as being patentable. There is no express exclusion affecting biotechnology as there is in the case of pharmaceutical products.

The National Directorate of Industrial Property has for instance granted more than 70 patents in recent years for inventions in the biotechnological field.

This Law is due to be amended, and the various preliminary drafts before the Parliament all provide that the same tradition should continue. Be that as it may, should new plant varieties and animal breeds still be excluded from patentability, the Seeds Law would cover the legal aspects of the protection of intellectual property rights in the plant varieties.

VIII. CONCLUSIONS

In the course of this exposé we have noted the changes in markets, and also Argentina's integration in those markets. We have likewise looked at the great changes in plant breeding that are made possible today by genetic engineering.

We have highlighted the change in the role of the State and the reform and deregulation processes. In the face of all these changes, the legal and technical standards that have to do with the ownership, certification and quality of seed have been adapting in their turn.

Today we are at a watershed in this process, and we have to remain alert to the changes that are likely to come in the future. This attitude is crucial to the competitiveness of our agriculture.

Argentina not only offers its well-known agricultural and environmental advantages and its human and technical resources, but also offers local and foreign investors the new reality of economic stability, with growing openness, and also a legal, technical and administrative infrastructure in the process of reorganization and modernization, which affords sufficient guarantees.

On the specific subject of seeds, we would point to the new Regulatory Decree under the law, the transformation of CENASE into INASE, the agreement within the framework of the Latin American Integration Association (ALADI) on the liberalization of the seed trade in the region, and in the same connection the agreement on the protection of new plant varieties brought about by the five countries of the Southern Cone and the seed export agreement with the EEC, not to mention international events like this one and also the World Congress of ISTA in Buenos Aires in October 1992.

The private sector participates fully in the process, as witness in particular the establishment of ARPOV and the work actually going on within CONASE.

I hope that this quick run-through of the various subjects will be useful to the review of the past, the analysis of the present and the debate on the future. We in the SAGYP and CENASE are at your disposal and willing to work together to bring Argentina's agriculture and its seed trade into a prominent market position.

To sum up, the essence of this exposé is that our new, diversified agriculture requires new plant varieties, and the new plant varieties themselves need intellectual protection if they are to develop.

A PLANT BREEDER'S VIEW - THE POTENTIAL IMPACT OF PLANT BREEDERS' RIGHTS UPON THE PLANT BREEDING AND SEEDS INDUSTRY

Dear representatives of the official sector, representatives of the seed companies, members of UPOV, journalists and all of you, Ladies and Gentlemen invited to this seminar,

It is with great satisfaction that I occupy this place on behalf of the Latin American private seed sector and of the Argentine Association for the Protection of Plant Breeding Obtentions. This meeting is taking place at a very significant time for this continent and in the global scene. Maybe with fewer reverberations and less international publicity than other events in various important parts of the world, in this continent, but in general, essential transformations are taking place from the political, economic and legislative point of view, that have a direct influence on the private business world; transformations with more stable economic policies, legal security and property protection, will undoubtly return to this region of the world, which is rich in natural resources, the possibility of growth and of offering to its peoples a more promising future.

We, the private seedmen, have been working hard and silently towards this goal, sowing, day after day, within the public and private sector and even within the community itself, principles such as the protection of property in a cultivar, an effective right for the breeder to collect a fair reward for his varieties, the elimination of artificial barriers to the free trade in seed and respect for and integration into the international rules for seed trading and seed quality.

Let's see some of the recent events in which our sector has played an important role:

- Panamerican Seed Congresses, where the most important topics of the seed business are analyzed and which involve participation of private and official representatives and of top level lecturers on various technological, political and economic aspects of the seed industry. Our next meeting will take place in Santa Cruz de la Sierra, Bolivia, in 1992.

- Business Round Tables. The echos can still heard of the last business round table that took place in Santiago de Chile, sponsored and promoted by FELAS (Latin American Seed Federation). At these events regional seed companies and seed businessmen gather in order to get to know each other better, make contacts, do business and have the opportunity to listen to expert lecturers.

The attendance of the presidents of FIS and ASSINSEL at this event demonstrated the growing importance of this type of meetings at an international level. From the previous business round table in Bogotá arose, with the support of the private sector, the ALADI Agreement (Association for the Latin American Integration), which will enable the more fluid commercialization of seed among the countries of the area.

There is much more which could be said, but by now you may be wondering what all this has to do with the title "The potential impact of plant breeders' rights upon the plant breeding and seed industry." OK, let's go now right to the point and to the new and already rich experience of ARPOV (Argentine Association for the Protection of Plant Breeding Obtentions) in Argentina.

Within our sector, nobody doubts the necessity and appropriateness of protecting the rights of plant breeders on their varieties. There are very few people still supporting the theory that someone who devotes years of effort, knowledge, investments and technology in order to achieve a phytogenetic creation, should have no right to protect the fruit of his work and to obtain a revenue from it, not only as a reward for his effort and as a way to earn his living, but also as a tool to keep on researching.

I believe that the notion of the breeders right is such that it constitutes a human right and it is in no way invalidated by the fact that the breeder's work is based on elements that pre-exist in nature; as a matter of fact everything that man has developed, in all areas, has started or starts from pre-existing natural elements, to which he has added work, time, capital and inventiveness; this is just what has happened in the seed activity.

Cultivar protection or patents, one or the other, or both of them, with or without biotechnology, etc. is such a complicated subject that it far exceeds the time available for this presentation. But there is something that, for me, is concrete: the obvious need to have a law for the protection of plant breeding work in any country which does not want to run the risk of being left apart from agricultural progress or to be denied the access to new and better crops or, what is even worse, to discourage genetic research among its citizens, who will lack the incentive to devote themselves to this essential activity. To this we must add the fact that the research carried out by official institutions has suffered some changes, and they also need to receive a profit on their varieties in order to keep on with their studies.

Currently, licences and agreements between official institutes and the private sector are a common thing, not only in Argentina (we have been preceded by Europe and by the United States of America), but also in all those Latin American countries which are struggling not to fall behind in agricultural progress.

Therefore we can conclude that without protection for plant varieties:

- There will be no access to new varieties in the different crop areas.
- No international investments will be captured for research and development.
- Both private and public national research will be mortally wounded.
- We will be left apart in the integration processes that are currently taking place.

Another very important aspect related to plant variety rights is the technological development that now enables the detection, even in hybrids, of a third party's clandestine use of a breeder's line or variety that violates the plant breeders' rights by using an element that does not belong to or which has not been licenced to the third party and by subsequently taking advantage of this to compete unfairly in the market with the true breeders of

the varieties or lines and finally cheating the farmers and the whole community about the origin and identity of the products. The new technologies, and the researchers' firm determination to actively defend their rights, make me foresee significant changes in our industry during the 90s. The illicit use of something that belongs to someone else will no longer be easy or go unpunished.

Experience demonstrates that adequate protective legislation, even though it is essential, is not enough; it requires much more to be effective. Under "effective" I understand the actual possibility of receiving royalties or enforcing rights that are the natural consequence of property. A granted and proclaimed property that cannot be exercised is very similar to a non-existent right.

This is precisely the core of the problem. How should the right be exercised? How can we ensure that the law is observed, even, in some cases, in the face of deeply rooted customs and practices?

The following is required:

a) An adequate legal framework that, in its basic and processing policy, enables action to enforce the law for the protection of the varieties of plant breeders.

b) A positive attitude on behalf of the Government, that has the policing function towards collaboration with the private sector in the application of the law (inspections, etc.).

c) A special campaign to explain and educate judges, public officials, agricultural operators and farmers on the benefits of the system and on the subject itself, with all its consequences.

d) It is important to mention the tax potential for evasion, that generally accompanies the illegal bag system under which no royalties are paid.

e) The establishment of a private sector organization (comprising companies and individual plant breeders), who, whilst maintaining their individuality and policies, come together in a common system with the objective of defending their property rights and the collection of their royalties, that is to say, an organization which studies the legal-technical mechanisms, organizes the relationship with the Government, proposes standard contracts, finds a fast mechanism for enforcement, identifies licencees and the bags produced according to a royalty system, organizes discussions with the representatives of the agroindustry, grain buyers, elevator operators, associations and farmers, initiates legal actions, deals with officials and educates public opinion. The organization provides an executive arm and a defendant for the whole package of duties and rights that each company by itself would not be able to examine and perform.

Aspects such as who and how to licence, how much should be paid, how to collect the money, etc. are and will be in the hands of each company, which is free to decide whether to get licences itself or through the organization.

ARPOV is such an organization. In order to organize it we based ourselves on many ideas and the experience of Europe, adapting them to the Argentine environment, and added our own experience and ideas. In order to succeed and whilst applying an old juridical principle "interest is the measure of the action" we concluded that the law by itself did not suffice and that we could

not expect the Government to be responsible for its application. The power of defending their rights was and still is in the hands of each company and of each individual plant breeder, and for this purpose we have come together in ARPOV.

Another basic concept, as old as the hills, is that in order to have the law respected by those who break it, the inconveniences and dangers of this unlawful act should be more significant than the benefits they may obtain from the infraction. Only by ensuring that this is so will we be able to change old habits, where in the absence of an adequate law, or for lack of action, plant breeders have been deprived of the fruits of their, in many cases, whole life's work.

In Argentina we are proud of the progress made by ARPOV which even exceeds our initial expectations. This progress includes aspects such as the number of associates, support, other sectors' realization, licencing system and fundamental collections.

ARPOV's general manager, Mr. Severo and myself, will be available for you in order to deepen your knowledge of ARPOV and its current status.

We have had to face many obstacles and problems in the past and there are still many others to be solved, but our growth is continuous and our goals very clear.

Dear Ladies and Gentlemen, thank you very much for your attention.

PLANT BREEDERS' RIGHTS; A VIEW FROM A LATIN-AMERICAN COUNTRY

First of all I should like to express my thanks to the Ministry of Agriculture, Fisheries and Food of Spain, to UPOV and to the Secretariat of Agriculture, Livestock and Fisheries of Argentina for having given me such an excellent opportunity of broadening my knowledge and experience by participating in this Seminar, and of engaging in a reflection, in the presence of such a highly qualified audience, on the position of a South American country concerning plant breeders' rights.

In our countries, the design and adoption of property regimes for cultivars has developed considerably in recent years. This has been due to the progress made in research activities, the development of the seed industry and the fact that plant improvement has ceased to be an activity of public sector concern only. At the same time a change has taken place throughout society, which now understands and agrees that research and development investment for the creation of new varieties needs to be justly rewarded. The change is probably explained by certain noteworthy advances in the rate of agricultural growth in our countries, which reflect the important role of the genetic contribution of varieties to the enhancement of agricultural productivity.

In a number of our countries provisions on the intellectual property rights in plant varieties were enacted quite recently. The rights were provided for but in fact were not implemented until some years later, and in the intervening period the law has played the not inconsiderable role of serving to inform and educate the economic operators involved in seed activity, and to create a climate of respect for intellectual property in the area. Winning respect for breeders' rights and impressing them on the social consciousness are not easy objectives to attain. Seeds have always been considered public property, and until just a few years ago there was no evidence in the history of our country's agriculture of monetary reward being given for the use of technology of genetic character.

While the conception and recognition of intellectual property rights in plant varieties should be perceived as a cultural process that consequently becomes an economic one, it also has to be agreed that the processes involved are gradual, and that any sudden jumps made under duress, if not accepted, are legally circumvented with ease.

The intellectual property system that has established itself in our region is of course a property system involving breeders' rights, with its two peculiar characteristics, namely the farmer's privilege and the exemption of the plant improver. With regard to the former in particular, it does not seem reasonable, at least for the moment, to contemplate any change in legislation that might diminish the privilege.

The protection formula deriving from the 1978 Act of the UPOV Convention is the one that we consider ideally suited to our present needs, and we expect it to be readily accepted when it is proposed to the public at large. We consider one of the great achievements of the 1991 Act to be the concept of essentially derived varieties. Reflections on the abuses of the intellectual property regime that might stem from small and insignificant changes made solely for protection purposes, such as those known as "cosmetic" improvements,

or on the idea of varieties with an important background of adaptability to local conditions being modified by genetic engineering without recognition of the owner of the initial variety, have led us to the conclusion that the ideal protection system for our countries, with activities as they are at present, would be the UPOV 78 model with added provision for the essentially derived varieties concept.

When legislating on plant variety rights in Uruguay, we have also given thought to the possibility of securing a set of advantages which we should like to mention here:

Promotion of Investment in the Breeding of New Plant Varieties

Plant varieties frequently reproduce themselves, so it often happens that, once a breeder of plant varieties has released propagating material of his variety, that material can be freely reproduced by third parties, thereby depriving the breeder of the full benefit of his efforts. The breeding of plant varieties calls for protracted work and investment which individuals are often not prepared to make when they lack protection. By setting up a system of exclusive exploitation rights for the breeders of plant varieties in our country, we are seeking to promote the start of new plant variety breeding programs and to give impetus to the work being done on present programs. The presence of competitive drive in the breeding of new plant varieties for the specific purpose of meeting our agricultural needs is a basic condition that will determine the future competitiveness of our country.

Development of Plant Varieties Suited to Specific Conditions in One's Own Country

Plant varieties are selected for their optimum performance under particular conditions. In order to achieve such optimum performance, they have to be resistant to specific combinations of pests and diseases, and they also have to adapt to our climate and production conditions. The best means of selecting plant varieties for such purposes is to do so in the country's own growing areas. The protection of plant varieties encourages national and foreign breeders to invest in the breeding of plant varieties in the country and to develop plant varieties suited to our specific circumstances. If there is no breeding of adequate national varieties of particular plant species, producers will be forced to use plant varieties that have been bred in other areas which, while perhaps acceptable, may not actually be ideal for our conditions.

Attraction of Foreign Plant Varieties

When there is no protection, foreign breeders are likely to object to providing the country's production centers with seed or other propagating material of their best and most recent plant varieties to satisfy local demand. When there is protection, breeders feel more sure about setting up production within the country, instead of insisting that local demand should be satisfied with imported seed or other propagating material, which would be an avoidable drain on currency. Furthermore, the existence of protection will encourage them to make their best and most recent plant varieties available at short notice.

Multiplication of Foreign Plant Varieties Within the Country

If the country's circumstances are suited to the multiplication of species, and if protection is available, foreign seed traders are likely to be more willing to send plant material for multiplication to the country. This will enable us to participate more freely, as exporters, in the international seed trade.

Our country for one has firmly rejected the patent system as a means of protecting plant varieties; it should not be forgotten that the role of the agricultural and livestock sector is being promoted throughout our region in a strategy for development and escape from crisis, and therefore any monopoly liable to have an adverse effect on agriculture, which the patent system as applied to plant varieties might, is not socially acceptable.

The detailed regulation of protection in the UPOV Convention has given rise to a very high degree of harmonization, which is very good for the users of the system and interested economic groups. In any case, the fact that the provisions written into the Convention are no more than minimum standards affords UPOV member States sufficient freedom to introduce broader national systems that allow the States concerned to adapt to future developments in their seed industries.

My country, like Argentina, has resolved to join UPOV. Both our countries have started proceedings to this end, and the Council of UPOV has pronounced our laws conformable, so it remains only for us to deposit our instruments of accession to the Convention.

On acceding to the Convention our aim is that the protection system in our country should be recognized, that it should have credibility and that it should thereby win the confidence of the seed world with respect to protection.

Our adherence to the UPOV Convention also makes the following possible.

More Readily Obtainable Protection for the Plant Varieties of National Breeders in Other Countries

As members of UPOV, we shall assure our breeders and resident foreigners of the right to claim protection for their plant varieties in all the other member States of UPOV. All UPOV member States will be obliged to afford the same protection to the plant varieties of our breeders' firms as they grant to their own national firms. UPOV member States have acknowledged that it is not right to limit protection to their own national breeders. To do that would be to promote the pirating of foreign plant varieties and, as a result, unfair competition between pirated foreign plant varieties and protected national varieties.

When the breeder of a foreign plant variety protected in our country grants a license to a national firm, market forces should ensure that any outgoing royalties are offset by economic benefits from the use of the plant variety concerned.

Possibility for Breeders to Claim Priority in Other Countries

Membership of UPOV will enable our countries' firms that have filed protection applications with us for their plant varieties to claim a right of priority for corresponding applications in all the other member States of UPOV.

Participation in the Promotion of Other Countries' Plant Breeders' Rights Systems

Belonging to UPOV will help us to promote the existence and use of the system among breeders and international circles in other member States of UPOV.

Possibility of Taking Advantage of Technical Knowledge Existing in Other UPOV Member States

Membership of UPOV allows us to avail ourselves of the accumulated technical knowledge of the UPOV member States with regard to the establishment and operation of a plant breeders' rights system.

The UPOV system is a good foundation on which to base the exchange of examination results among the services of the various States of the Union when the breeder also applies for protection in UPOV States. This form of exchange not only makes it possible to save time and money, but also averts the risk of different offices taking conflicting decisions, which is of particular significance owing to the predominantly international character of the seed trade.

Participation in the Future Development of the Plant Breeders' Rights System

The UPOV protection system has become a world standard for the protection of new plant varieties. It establishes an international system recognizing the innovator's moral right to protection for his products. Membership of UPOV affords us the opportunity of influencing future develop- ments in that world system by means of the UPOV meetings and conferences, and where necessary of exercising voting rights as a member State on the UPOV Council.

Easier Licensing and Technology Transfer

The general consensus is that membership of UPOV facilitates licensing and technology transfer involving plant varieties from abroad, and enhances the position of our countries in international economic and business relations, particularly with regard to agriculture.

To summarize, it is our belief that membership of the Union for the Protection of New Varieties of Plants may be expected to benefit the country's economy, on the one hand by serving to encourage breeders based in the country in their efforts to ensure the production of new varieties capable of solving specific problems peculiar to the agriculture of our own and other countries, and on the other hand by enabling our producers to make use of potentially beneficial foreign varieties and to afford the breeders of those varieties the same guarantees that Uruguayan breeders would have, or those that they would have in other countries with which Uruguay has seed-trade relations.

I propose now to talk to you about certain steps that are being taken by the countries of the region in connection with the seed trade and plant variety protection.

The operation of an integrated seed market, as provided for in the Regional Agreement on the liberalization and development of the seed trade currently being signed under the aegis of the Latin American Integration Association (ALADI), will promote the active exchange of seed. To that end it is necessary

that genetic material in circulation in the region be treated as consistently and harmoniously as possible. If, in a region with similar agricultural and ecological areas to which the same varieties can adapt, there are some countries with protection and others without, this results in inequality between duly recognized cultivars of the country that grants protection and foreign cultivars, which generally come on to the market without authorization from their owners and do not have responsible agencies to distribute them with the requisite quality and purity guarantees. Such a situation is not going to encourage legitimate owners of varieties to supply unprotected markets with good seed.

The Advisory Board on Agricultural and Livestock Cooperation in the Southern Cone (CONASUR), which brings together the agriculture ministers of Argentina, Brazil, Chile, Paraguay and Uruguay, recognized in its Resolutions No. 11, adopted in Vila del Mar (Chile) in April 1991, and No. 19, adopted in Piriápolis (Uruguay) in November 1991, the need for the protection of plant variety ownership by means of breeders' rights, and for the use of harmonized provisions by the five countries.

The process for the implementation of the resolutions involves taking the following action:

(i) improvement of the conditions of protection systems already existing in the region, taking due account of relevant international trends and putting in hand such legislative amendments as might be required for the purpose, in Argentina, Chile and Uruguay;

(ii) promotion of the enactment of breeders' rights legislation as the recommended protection system in countries where there is no such legislation, by providing the Governments of Brazil and Paraguay with general guidelines for the purpose, which will entail drawing on regional and international experience, and will serve for the creation of legal bodies universally recognized by interested operators;

(iii) alignment of the legislation of countries of the region by means of a regional convention on the protection of new varieties of plants, which will enable the countries to work in a coordinated fashion on protection matters, to make the most of mutual advantages, to lend each other assistance on technical aspects of protection and to acquire greater bargaining power in international dealings.

In any process of harmonization of plant variety property, relevant international trends cannot be disregarded. In recent years the industrial property problem has come to the fore in response to the growing importance of technology and the progress made in biotechnology. The most advanced countries are pressing for new international rules, and this is making itself felt in various gatherings such as those of GATT and WIPO. In the case of new varieties of plants, the Convention for the Protection of New Varieties of Plants (UPOV) has become the basic international treaty for the protection of the rights of breeders of new varieties, and it is appropriate to point out that the proposed Regional Convention is inspired by and generically consistent with the provisions of the Union Convention as revised in 1978.

Likewise the above-mentioned Resolution No. 19 of CONASUR approves a cooperation program in the field whose purpose is to ensure that the action specified is rapidly taken, apart from which it entrusts the Coordination Secretariat of CONASUR with the management of funds to finance it.

We wish to take advantage of the presence of the President of the UPOV Council, the Vice Secretary-General of the Union and other distinguished members of this party to announce that, according to our recent experience in Latin America and in particular in the countries of the Southern Area, we feel that a protection system on the UPOV 78 model, combined with a limitation of the plant improver's exemption by the introduction of a restriction imposing the essentially-derived varieties concept, is in summary terms the ideal protection regime for the region under present circumstances. We therefore take the liberty of submitting to you that it is very important that due account be taken within UPOV of these aspirations, the effect of which would be that many more economic operators and many more countries would readily agree to the introduction of protection systems.

F O U R T H S E S S I O N

PANEL DISCUSSION

CLOSING STATEMENTS

Chairman: Héctor Ordóñez, Cabinet Counsellor, Ministry of Economy, Secretariat of Agriculture, Livestock and Fisheries, Argentina

PANEL DISCUSSION

1. Mr. Hector ORDOÑEZ opened the general discussion.

2. Mr. Fernando BARBERENA asked about the position of UPOV with respect to the new techniques used for variety identification, taking also into account the issue of the use of this kind of technology to obtain evidence in proceedings relating for instance to parternity.

3. Mr. Barry GREENGRASS recalled that, under the UPOV Convention, plant varieties could be protected if they were distinct, uniform and stable, and UPOV sought to harmonize the application of these criteria by developing guidelines which could be applied by all UPOV member States; those guidelines identified specific characteristics that were useful for the purpose of making distinctions. Obviously, technology was providing more and more potential characteristics. But, of course, it was not necessary to use in every case biochemical approaches, in particular where two varieties could be clearly distinguished without using a sophisticated laboratory or resorting to complex chemistry. However, UPOV was aware of the use of electrophoresis and the UPOV Technical Working Parties were currently working on standardized laboratory techniques for some of the most important species. UPOV was also well aware that the possibilities would be much wider in the future with the use of RFLPs, for example, and other forms of genetic probes, and those would be used eventually, if need be.

4. Mr. Ricardo CHEVALLIER BOUTELL described a hypothetical situation in which, in a member State of UPOV, a breeder owned a registered variety and another breeder submitted a variety with virtually the same morphological characteristics, claiming a difference revealed by some technique such as electrophoresis or RFLP. He asked what was the position of UPOV and whether the two varieties would be considered to be distinct.

5. Mr. José María ELENA replied that, currently, no characteristic derived from such techniques was included in the lists of characteristics adopted by the technical bodies of UPOV, and there was no recommendation from UPOV to accept the use of any of those techniques. In his opinion, the question raised was one for national legislation of the member States. Mr. Elena also believed that, where the difference was only based on a characteristic derived from a sophisticated method that was not accepted or recommended by UPOV, the decision would be that the second variety would not be considered to be different. But there might have been some cases in which a different decision had been taken in one or another member State and a variety had been protected on the basis of an electrophoretical difference.

6. Mr. ORDOÑEZ asked Mr. Elena whether, in the case where a title of protection had already been issued and new information was obtained through such new techniques, the title may be cancelled.

7. Mr. ELENA replied that there was no experience since those techniques had not been used yet. The difficulty or the delay in accepting them as useful techniques for distinguishing varieties resulted from the fact that some varieties--for instance wheat varieties--which had been considered to be homogeneous on the basis of the "traditional," mainly morphological, identification characteristics were not homogeneous when analysed with an electrophoresis method. Through the application of an electrophoresis method, one could discover two or three lines which, if the method were accepted, could be protected as varieties in the traditional meaning; this would lead to an erosion of the rights of the breeder of the first variety.

8. Mr. Ricardo LOPEZ DE HARO added that the UPOV Convention and national legislations provided for two cases of annulment of a granted plant variety protection title: where it was established that the condition of distinctness or novelty was not fulfilled when the title was granted, and where it was established that the breeder was not really the breeder of the variety. The question raised by Mr. Ordoñez might have been directed to the first case insofar as the new techniques might serve to demonstrate that the variety had been copied from a previous one.

9. Mr. Carlos RIPOLL asked what was the rationale for the right of producers to use their own seed without having to seek the authorization of the breeder. Whoever multiplied and sold seeds had to obtain authorization thereto because he was making a profit from his business of selling the seed; but, after all, the producer who used his own seed to produce grain was also making a profit. Was the reason a practical one (the impossibility for the breeder to follow track) or was there some other reason?

10.1 Mr. GREENGRASS replied that the answer laid purely in the realms of sociology and politics: when breeders attempted to secure recognition of their industrial property rights, they found themselves confronted with claims of producers or farmers about their traditional rights. The "farmer's privilege" represented but one example of conflict of interests. In 1961, when the UPOV Convention was first developed, nobody questioned the right of a farmer to reproduce his own seed. Today, opinions were changing. In the 1991 Diplomatic Conference, the current political situation was reflected in the Convention: it was felt that it was not possible to conclude a new Convention unless the possibility was given for individual countries to continue to recognize the rather special position farmers enjoyed for certain crops, or also to take account of some logistical aspects such as the difficulties arising in the transportation of seeds. Another aspect--of a highly practical nature--was that governments had not wished to grant a right to breeders which the latter would have great difficulties to enforce.

10.2 Mr. Greengrass added that one was of course receptive to the question why farmers should be entitled to freely use the creation of some other person to their economic benefit; but the current situation was that most governments would not be too happy with the idea of removing this possibility available to farmers. Opinions were gradually changing, however: in many countries, farmers now realized that, to be competitive, they had to be serviced by an effective and well funded plant breeding industry, and that the "farmer's privilege" might have to be abandoned to secure that service. The 1991 UPOV Convention contained a reasonable compromise and reflected the current international opinion on this subject.

11. Mr. Bill WHITMORE added that in New Zealand, there had been a change in thinking in this regard. Until very recently, New Zealand farmers believed that they should have the privilege of keeping their own seed and resowing it without paying a royalty. But they had come to recognize over recent years that it was only just for breeders to receive a fair reward for their efforts and that, unless they accepted a change in policy in this regard, they might in future no longer have new improved varieties of wheat and barley at their disposal.

12. Mr. LOPEZ DE HARO added that in some countries, in particular Spain, the rate of use of commercial seeds in some agricultural crops such as wheat and barley was not very high (25 to 30% in the case of wheat in Spain). The complement corresponded to the re-use of seeds by farmers, not to speak about any possible clandestine activities. In the 1991 Diplomatic Conference, the position of his country on this subject had been to defend to a certain extent the "farmer's privilege" because it was very difficult for a country with such a seed consumption pattern to impose over night the full implementation of the breeder's right as provided in the Convention and as also provided in Spanish legislation. The new Convention admitted that Contracting Parties could legislate in this area, but requested them to always safeguard in one way or another the legitimate interests of the breeders. It was the political pressures in Spain and other countries which had lead to this solution.

13. Mr. ORDOÑEZ wished to describe the situation of the seed and wheat market in Argentina. Data collected by the private sector showed that the use by farmers of their own wheat seed was low (around 10%). But there appeared to be an important parallel--"brown bagging"--market: unscrupulous cooperatives and private seed merchants were using (or abusing) the "farmer's privilege" as a screen to hide large-scale commercial activities. Efforts were being made to bring the "brown-bagging" back under the law, using the State's power of police. In view of the importance of agriculture and farmers for Argentina, the political support would go towards farmers keeping the benefit of the right to save seed for use by them on their own holdings. The authorities, on the other hand, did not wish farmers to loose their "privilege" because it was being misused by merchants having no right to operate on the seed market. This position was somewhat different from that described by Mr. López de Haro.

14. Mr. Eduardo DE LA ROSA LOPEZ asked Mr. Elena to clarify the meaning of "homogeneity," with particular reference to his reply to a previous question on the use of biotechnological tools and his remark that there might be different definitions at the level of the chromosomic map within a variety currently considered to be homogeneous by UPOV. On the other hand, the objective of breeders, particularly of self-pollinating crops, was to ensure stability in cultivation with respect to disease and other problems. Consequently, homogeneity was more of an agronomic nature, and not so much a matter of genetic composition.

15.1 Mr. ELENA recalled that the Convention contained a relatively broad definition of the requirement of homogeneity: "The variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics." That was the text of the 1991 Act, but there had been no substantial change over the text of the 1978 Act. The general principle was

that the variety had to be sufficiently uniform in all characteristics used to distinguish it, including in any new characteristic.

15.2 The precise level of homogeneity was somewhat variable, depending on the type of species and the type of variety. Taking into account the type of use of the varieties, one occasionally encountered some problems; it was a principle of plant breeding that material with a very narrow genetic base tended to have a narrow adaptability, i.e. an adaptation to precise conditions. If the material had to demonstrate flexibility towards climatic conditions and pathological aggressions that were very variable, then it had to have a broad genetic base. It should therefore be clear that in drawing up Test Guidelines, the UPOV Technical Working Parties took into account the opinion of the identification specialists and of the breeders--the true experts of the crop--when setting the precise homogeneity levels. Normally, one would work with standard levels of homogeneity, but there had been cases where the standards had to be changed to accomodate a new type of variety. One of the major aspects of the technical work in UPOV was the permanent effort to adjust the reality of the world of varieties to the possibility of identifying them.

15.3 At times it was said that those norms lead to varieties that were excessively homogeneous; but if one wished to have stability--including in the agronomic behavior--there had to be a certain level of homogeneity. And if a title was granted to a breeder for non-homogeneous material, he would encounter problems in exercising his rights subsequently.

16. Mr. WHITMORE added that when the New Zealand Plant Variety Rights Office started processing applications for cereals, breeders expressed great concern about the Office imposing standards from UPOV which might be too strict and in fact unrealistic. It had been found in practice that those standards were in line with those used for certification, and in fact in many cases less stringent.

17. Mr. Daniel RUBIO stated in relation to the saving of seed by producers that, generally speaking, the first States which formed the Union were currently trying, in a carefully thought-out process, to change for a right conceded to the producers. He asked in relation to the possibility mentioned by Mr. Blanco of having a kind of hybrid between the old and the new version of the UPOV Convention, whether it was possible from a political point of view for States contemplating accession to the Union to solve the problem by using the circumstance of the accession to refuse to concede that right.

18. Mr. GREENGRASS felt that there might be some misunderstanding here. Under Article 15(2) of the 1991 Act of the UPOV Convention, every country remained free to exclude from the breeder's right, if it so wished, the reproduction of seed on a farm for use on that farm. The language of that Article had been very carefully drawn up. It had not been politically acceptable in the Diplomatic Conference to remove the possibility for farmers to keep their own seeds. One should therefore not take the position that the 1991 Act created a difficulty with respect to farm-saved seeds.

19. Mr. HEITZ added that there was perhaps also some confusion about the first part of the premise, relating to the 1961 and 1978 Acts of the Convention. Those Acts, like the 1991 Act, specified a minimum scope of protection,

and that scope implied a possibility for farmers to produce their own seeds; but by no means did those Acts impose that possibility in each and every case. The possibility was not available for ornamental plants. In the case of fruit trees and vegetables, certain current UPOV member States had already made provisions on the basis of the 1978 Act to exclude the production of seed or planting material by producers for their own use or to make it subject to the payment of a royalty. In France, under the 1978 Act of the Convention, there was no "farmer's privilege," as revealed by case law: breeders had been experiencing a progressive deterioration of the terms under which they and the seed trade operated, and had sued some alleged infringers to obtain a clarification of the legal situation; the Tribunal had affirmed the non-existence of the "privilege." A kind of agreement has then been concluded with farmers, which implied that certain farmers could do certain things outside the scope of protection, in a way similar to private copying or home-taping under copyright. The example of France showed that the absence of a "farmer's privilege" did not prevent a pragmatic approach to the exercise of the breeders' rights, an approach which was altogether satisfactory to farmers as well.

20.1 Mr. ORDOÑEZ made a comment to Mr. Rubio since he had participated in several preparatory meetings of the Diplomatic Conference and in the Conference itself. He had received strong instructions to support, in his capacity of representative of an observer State, the continued existence of this exception to the right in the new Convention. The exception was permitted by the latter. As Mr. Heitz had rightly said, the 1991 Convention, like its predecessors, established a minimum scope of protection and it belonged to the States to either increase the scope under national legislation--as France had done--or make use of the exceptions provided by the Convention. The lesson to be drawn from this was that this kind of international treaties, far from being rigid as sometimes suggested, offered quite some flexibility.

20.2 It would be very useful to read all these international conventions and the national legislations to see how they were applied with the said flexibility. Mr. Ordoñez wished to suggest, as subject of further analysis and discussion, that each State could legislate in accordance with national circumstances, both under the 1978 and the 1991 Act, taking into account certain minimums to harmonize its legislation internationally and have it recognized, and thereby to promote the exchange of technology; it should consider the real interests at stake rather than battling, on the basis of preconceived opinions, with ideological concepts.

21. Mr. RUBIO clarified the questions: wasn't it so that the first UPOV member States had elaborated their thinking further and would now prefer, in retrospect, not to have made the concession to the producers? And if so, shouldn't the States currently contemplating accession to UPOV try to avoid going through the same process?

22. Mr. LOPEZ DE HARO replied that it depended on the question which States were to be considered among the first. In his opinion, the first member States had not faced the problem of the use of seeds of a protected variety by farmers as much as the States which had joined UPOV later on. This problem had not been very serious at the beginning. Replying to the second question, Mr. López de Haro repeated that the "new" member States could lobby to change the situation, if they thought it fit; but in his opinion, a change would be difficult to obtain since some States present at the Diplomatic Conference were in some

ways and with certain limits advocates of the "farmer's privilege." He added that Spain, in particular, would not have signed the 1991 Act, had it not contained Article 15(2).

23. Mr. GREENGRASS stated that when amending legislation at domestic level, the vast majority of the current UPOV member States would probably give farmers some sort of right to produce seed on their own farm. He also wished to explain the general approach to the definition of the breeder's right in the 1991 Act and address the questions of who was a farmer and what was his "privilege". He recalled that he had mentioned the example of somebody who bought a fruit tree and planted an orchard of some hectares with the progeny of the tree. That person was not at all compensating the breeder in a reasonable way for his contribution to the new orchard. This problem had become more serious, for instance, with the advent of tissue culture techniques: a particular plant genotype designed for a specific purpose could well be produced on a large scale by the industrial entity concerned and used in a closed system, without ever rewarding the breeder. In the past, hybrids had enjoyed a kind of natural in-built protection because they could not be reproduced when the parent lines were not available. Nowadays, in many species, particularly in vegetables, the hybrid could be easily reproduced by tissue culture. These were examples of new situations arising from progress in biotechnology in the light of which the 1991 Act had been elaborated. Those situations required a new approach to this subject; any "farmer's privilege" should be designed so as to exclude such activities from its scope, even when they were conducted within the ambit of an agricultural enterprise.

24. Mr. Joáo SCHNEIDER referred to the opinion given by Mr. Blanco and asked whether a State could include in its legislation a provision extending the protection of a variety to essentially derived varieties and still choose the 1978 Act of the Convention as the basis for its membership in UPOV.

25. Mr. GREENGRASS replied that from a strictly legal point of view, this would not be possible since the law would not be in accordance with the 1978 Act of the Convention. The suggestion from Mr. Blanco was nevertheless interesting insofar as it recognized the importance of some of the elements of the 1991 Act of the Convention. Mr. Greengrass was however sure that, once there was a better overall understanding of the various issues, all countries interested in UPOV would be able to reach some reasonable accomodations because the essential underlying principles of the Convention had not been changed between 1978 and 1991 Acts, but rather fine-tuned so that they would be suitable for the years ahead.

26. Mr. ORDOÑEZ commented that a State taking over the concept of essentially derived varieties from the 1991 Act would do so on the basis of the view that this concept would be useful for its legislation and that others would not be so. He therefore invited Mr. Schneider to indicate what concepts of the 1991 Act of the Convention would not be suitable to the circumstances in Brazil.

27. Mr. SCHNEIDER replied that he was not able to say now whether other aspects would not be suitable. But he could imagine political pressures with regard to the right of producers to produce their own seeds.

28. Mr. LOPEZ DE HARO stressed that the 1991 Convention enabled each Contracting Party--each State wishing to accede to it--to legislate on the "farmer's privilege" in the way considered to be appropriate.

29. Mr. Carlos GATTARI said that his company was involved in legal advice in the field of plant breeders' rights, provided assistance in the field of strategy, law and contracts, and also contributed at practical level to the passive and active administration of royalty collection through associates. At the beginning of the Argentine Law it had become obvious that special strategies were required to ensure that the right was respected, including administrative proceedings and court cases. Mr. Laurence had drawn the attention to a court decision in the United States of America limiting the "farmer's privilege" on the basis of the area under cultivation. This was exactly at issue in a Court in Mar del Plata. This led to the question whether the Argentine case law was close to or distant from European and North American precedents, and also whether there was within UPOV a compendium of case law from member States that would be accessible so as to enable the use of relevant cases in comparative law, given that member States were bound by an international public law treaty which provided a certain degree of unification.

30.1 Mr. GREENGRASS replied that the Office of UPOV kept a collection of the laws of the UPOV member States and published them in English in "Plant Variety Protection," together with factual information relating to fees, lists of protected species and other matters of interest to subscribers; but it did not report on a regular basis on court cases.

30.2 Turning to the particular case in the United States of America, Mr. Greengrass observed that it was probably not relevant to most other UPOV member States because the United States law was quite different on the "farmer's privilege": when the Plant Variety Protection Act was passed by Congress in 1971, farmers in that country managed to secure for themselves not only the right to keep seed for use on their own farm, but also the right to sell seed under certain circumstances. The particular case concerned the boundaries of the right to sell, which did not appear in any other legislation.

31.1 Mr. OROZCO revisited the question of sufficient uniformity of the variety. Mexico had particular experience in the case of wheat, in relation to the color of the grain. Varieties were normally released at the F_6 or F_7 generation and showed segregation. This was contrary to the standards; despite that, breeders had been requested to state the percentage of the predominant level of expression of the characteristic, which was certainly in line with the criteria established by the technical bodies of UPOV. The situation was the same for maize and sorghum, since certain characteristics were difficult to fix for the breeder, either for reasons of genetics or because of the commercial trends in the variety sector, i.e. the demand for varieties adapted to specific problems, for instance diseases in the North-East of Mexico; plant breeders were very much under pressure to release resistant varieties--and maintain a patchwork of varieties in that area to buffer any problem--and the pressure was such that they were unable to reach the best possible homogeneity.

31.2 Concerning the flow of germplasm from the International Centers, which was an issue confronting all countries, Mr. Orozco observed that the varieties were made available to the national official programs in such a manner that they were entered in the national register of varieties of--or could be

protected in--several countries; different organisations could be the first applicant and hold the protection title since the variety originated from a specific program completed in several countries. This was particularly a problem for Mexico, where the National Register of Plant Varieties and patents were regulated by different laws.

32. Mrs. Carmen GIANNI referred to the fact that the foundation of UPOV had been due to the wish to go away from the patent and create a special system for new plant varieties adapted to their distinct nature. She asked why, then, the 1991 Convention permitted double protection, and whether this did not imply a contradiction with the original objectives. She also mentioned that, in general, the rights of the breeder were not sufficiently broad in scope and asked why no attempt had been made to reinforce them in the 1991 Convention and prohibit a double system which could give rise to a lot of problems at national and international levels.

33.1 Mr. GREENGRASS replied that the 1991 Convention resulted from the combined views of some 20 countries and their Governments. On the particular subject raised by Mrs. Gianni, there were differences of view amongst UPOV member States: the majority probably tended to favor the protection of plant varieties by plant breeders' rights, but a significant number of them thought that people should be free to decide whether to protect their varieties by patents or by plant breeders' rights, or that the Convention should not provide for a prohibition. When the Convention was revised, a sufficient consensus had to be sought for the revised text to be adopted by the Diplomatic Conference; in addition, if UPOV wished to set the worldwide standard for the protection of new plant varieties, it could not have a Convention which excluded some major countries with significant interests in this area from membership. The 1991 Act of the Convention was therefore silent on this question.

33.2 Whatever the text said, experience showed that the vast majority of plant breeders found the UPOV system "user-friendly," accessible by plant breeders without need for expensive professional advice, and capable of providing the scope of protection they needed. Under those circumstances, the majority of UPOV member States had felt that the restrictions of the kind to be found in article 2 of the 1978 Act were not really needed.

34. Mr. ORDOÑEZ added that the United States of America had two protection systems for plant varieties: the property titles for breeders and the patents. When its delegation to UPOV had been questioned on the subject of patents, it replied something which called for further reflection: the plant breeders' rights system had established as conditions for the grant of the right that the variety had to be distinct from known varieties, uniform and stable; it did not require the variety to be better, or worse, or superior in showing any special novel biological feature. The patent system had established quite different conditions and was directed at other types of situation. The requirements of inventive activity and sufficient description would create serious problems if all varieties on the national registers of property had to be patented. Mr. Ordoñez invited the participants to reflect on this: not all varieties would successfully pass the test of a patent examiner in the countries which granted this kind of title in respect of plant varieties.

35. Mr. WITHMORE emphasized that in New Zealand, plant varieties were protected by plant variety rights and not by patents; but that country had been

in favor of the removal of the prohibition of double protection as a matter of principle: it seemed to it rather inappropriate that the UPOV Convention, which was an international convention dealing with plant variety protection, should say what should or should not be patented and thereby interfere with the international conventions dealing with patents.

36. Mr. Eduardo CARILLO TOMIC asked whether, when a country had provided for a period of protection of 15 years and another for a period of 30 years for the same species, there was any obligation on the first country to extend the period in respect of a variety originating from the second.

37. Mr. GREENGRASS underlined that the question referred to a historic problem with a number of laws from the southern cone of Latin America; those laws had a provision whereby the protection that could be granted to a breeder from another country was limited to the period of protection that remained available in that other country. This kind of provision was in conflict with the national treatment provision of the UPOV Convention, whose effect was that the same period of protection had to be granted to breeders irrespective of their nationality or place of residence.

38. Mr. Miguel ESPINOZA wished to know how the cooperatives of agricultural producers should behave. In Paraguay, the experience showed that the majority of them produced seeds through their members, processed the seeds and redistributed them to their members; in some cases there were specialized seed producers within the cooperative. He asked whether this was possible under the "farmer's privilege" or, if it was not, what was the criterion applied by UPOV in this matter. He added that cooperatives were not acting for profit.

39. Mr. GREENGRASS replied that one had to look very carefully at the actual legal relationship between the parties involved--the individual farmers and the cooperatives--and the nature of the transactions between them--whether the property in the unprocessed seed was transferred from the farmer to the cooperative or whether the cooperative was simply performing a service in relation to seeds that remained the property of the farmer. He added that under the 1991 Act of the Convention, the breeder's right extended to seed processing, because it was known from experience that breeders' rights could be circumvented by claiming that the cooperative provided a service and that the property in the seed was not moving from one person to another.

40. Mr. Ordoñez was asked, in relation to the fact that the Argentine Republic had initiated the procedure for accession to the UPOV Convention, about the criteria of the Executive for the choice as between the 1978 and the 1991 Act.

41. Mr. ORDOÑEZ replied that it was not yet possible to adhere effectively to the 1991 Act, since it had not yet entered into force. No country so far had legislation incorporating the new concepts of the Convention. On the other hand, the current Argentine seed law, as amended in its application by the new implementing regulations, only enabled Argentina to conform to the 1978 Convention. There was nevertheless an interest in following very closely progress in the accessions to the 1991 Act because that Act contained very positive provisions for a State like Argentina.

42. Mr. OROZCO described the experience in Mexico with the use of seeds by cooperatives, from the point of view of the certification agency. Where the variety was from the State, the cooperatives were normally given the right to benefit from the seed--since it was not for purposes of profit--together with the certification service. In the case of private varieties, the agency would consider the right to use them. It would definitely be unacceptable to a certification agency--which held the National Register of Plant Varieties--that a cooperative would take private varieties to constitute a hybrid and request its registration. This was part and parcel of a responsible implementation of legislation. Mr. Orozco therefore asked whether UPOV was working on a computerized system for the communication of information between member States on protected varieties. In the case of Canada, Mexico and the United States of America, attempts were made to harmonize the principles in the field of varieties to avoid this kind of abusive use of varieties.

43. Mr. ELENA recalled that one of the obligations provided for in the Convention was for member States to inform each other on applications for protection received, breeders' rights granted and other relevant decisions. In this respect, there had been harmonization work quite some years ago on the presentation of the various items of information published in the official gazettes. UPOV was currently working on the creation of a computer network and also considering a system of exchange of the said information through a CD Rom compact disk service; the descriptions of the protected varieties based upon the UPOV formulars or descriptors might also be included with that information, possibly at a second stage. This might contribute much to the solution of the problem described by Mr. Orozco.

44. It was asked what was the cost of membership in UPOV for Argentina and whether the Government had decided on the way of recovering the cost.

45. Mr. ORDOÑEZ replied that UPOV had provided for a minimum corresponding to one fifth of a unit of contribution. The share corresponding to a unit currently amounted to US$ 30.000. Each country had to take a decision on the basis of its volume of activities in the field concerned, its contribution under other international Conventions, etc. Argentina had indicated in UPOV meetings that since it was being considered to add Spanish as an official language--which would increase the costs of the functioning of UPOV--it would be prepared to make a special effort. The decision would be taken by the Administrative Council of the National Seeds Institute, in which the private sector was represented.

CLOSING STATEMENT

by

Mr. Jorge Rosales King,
National Director of Seeds,
Ministry of Rural and Agricultural Affairs of Bolivia

Mr. Secretary of Agriculture of Argentina,
Mr. President of UPOV,
Mr. Vice Secretary-General of UPOV,

I was given the honor to express the sentiments of the official representatives participating in this seminar which is so important for the agricultural activity in our countries.

I wish to express our most sincere thanks to the International Union for the Protection of New Varieties of Plants, to the Ministry of Agriculture, Fisheries and Food of Spain and to the Secretariat of Agriculture, Livestock and Fisheries of Argentina, for having given us the opportunity to listen to so remarkable speakers and to discuss a matter of the importance of variety protection.

I am sure that when going home to our countries, with the impulse given by this seminar, we shall give priority to implementing or improving the protection of the rights of the breeders and to adhering in the short or medium term to UPOV. You can rest assured that this seminar will be the first of a series of meetings on this very important subject which will permit agricultural productivity to be increased in the various countries of the region. At the Fourteenth Pan-American Seed Seminar, in October of next year in Bolivia, ample room will be given to the subject of variety protection both in the program and in the parallel rounds of negotiations.

Finally, with these simple words, I wish to thank Mrs. Adelaida Harries and Mr. Héctor Ordónez for their support during this seminar, and all Argentine colleagues for having made us feel at home.

CLOSING STATEMENT

by

Mr. Ricardo López de Haro y Wood,
President of the UPOV Council

and

Technical Director of Seed Certification and the Register of Varieties,
National Institute of Seeds and Nursery Plants, Spain

I wish to convey to you my surprise at the contents of this seminar. I had the opportunity of visiting several countries of Latin America on several occasions since 1978 and to talk to various persons and institutions; but I have never seen as much interest as on this occasion for the protection of new varieties of plants, not only in Argentina, our host of today, but also in many countries of this area.

I also wish to thank you in the name of UPOV for the statements which were made yesterday and which gave the Secretariat of UPOV an opportunity to acquire a deeper knowledge of the reality in these countries and of their intentions for the future; a debate like the one which has taken place here always provides better information than, for instance, an exchange of correspondence.

I am pleased to repeat that UPOV has three objectives:

(i) to promote the breeder's right in the countries where it does not exist, without pressing, but simply drawing the attention of the decision-makers in those countries to the usefulness of the introduction of this right;

(ii) to harmonize legislation, for which there is a Convention;

(iii) to promote cooperation on the basis of harmonized legislation, which, from our personal experience, has been most useful.

We have spoken about patents and special laws, about the 1978 Act and the 1991 Act and its concept of essentially derived varieties, and about a regional agreement; we have heard during this afternoon the opinions of each of us and have been able to demonstrate that UPOV is open to all these possibilities and that there is no prejudice on the part of that organization in relation to what a particular country may wish to do, at a particular point in time, for its legislation. I may perhaps add that UPOV is not at all opposed, in its policy, to the countries which may be members of a regional agreement, provided that the agreement conforms to either the 1978 Act or the 1991 Act.

I shall do all my best during the three years of my term of office as President of the Council of UPOV which has started last month, to develop the relations of UPOV with the Latin American countries; UPOV is open to any form of cooperation, including to the organization of any event that may be appropriate.

Finally, I wish to thank you all for your participatation in this seminar, the Secretariat of Agriculture, Livestock and Fisheries of Argentina for the facilities which it has made available to all of us for the holding of the seminar, in particular the National Seed Service--or National Seed Institute

which hopefully will soon become reality--, the Grain Exchange for the nice room which it has made available, and the Association of Argentine Seed Producers and ARPOV for their important contribution to the organization of this event; finally, I shall of course not forget the Secretariat of the seminar and the interpreters.

To conclude, I may say: "Thank you, Argentina."

CLOSING STATEMENT

by

Mr. Miguel Ferre,
Presidential Counsellor,
Secretariat of Agriculture, Livestock and Fisheries of Argentina

Distinguished Representatives of the International Union for the Protection of New Varieties of Plants,
Distinguished Representatives of the Ministry of Agriculture, Fisheries and Food of Spain,
Distinguished Representatives of the Association of Argentine Seed Producers,
Distinguished Representatives of ARPOV,
Distinguished Representatives of the Buenos Aires Grain Exchange,
Distinguished Representatives of Latin American brother countries,
Ladies and Gentlemen,

I wish to say at the outset that I shall not take much of your time since I consider it inappropriate to make a long speech after two days of hard work.

In the name of the Argentine Government and in particular of the Secretariat of Agriculture, Livestock and Fisheries of the Nation, I wish to thank all those who provided assistance in the organization of this seminar. I also wish to express special thanks to all of you for your presence here, without which this event would not have been possible.

The national Government attaches great importance to this meeting for respect for the intellectual rights of the breeders of new plant varieties permits Argentina to insert itself into the world market by providing highly competitive products of good quality on a market that is every day more demanding.

With the assurance that this seminar will have met with the expectations of you all, I hope that we shall meet again soon and that we shall then all be members of UPOV.

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Marcelo REGUNAGA, Secretary of Agriculture, Livestock and Fisheries of Argentina

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