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UPOV/INF/11
ORIGINAL: GERMAN
DATE: DECEMBER 10, 1985

THE PROTECTION OF PLANT VARIETIES AND THE DEBATE ON BIOTECHNOLOGICAL INVENTIONS

PRESENTED FOR THE

INFORMATION MEETING OF JANUARY 10, 1986

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

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PROTECTION OF PLANT VARIETIES AND THE DEBATE ON BIOTECHNOLOGICAL INVENTIONS

I. INTRODUCTION

1. The development of biotechnology, particularly in the field of microbiology and cellular biology, in recent years has raised many questions, as yet unresolved, in the field of patent law. This situation led the World Intellectual Property Organization (WIPO) to convene a Committee of Experts on Biotechnological Inventions and Industrial Property, which held its first session in November 1984 and which is to meet again from February 3 to 7, 1986.[1] Discussions have also taken place in other international organizations and national bodies, the outcome of which is recorded in a number of voluminous publications.[2]

Biotechnology has presented patent law with numerous problems to which no solution has yet been found.

Numerous discussions in international organizations.

2. The International Union for the Protection of New Varieties of Plants (UPOV), set up by the International Convention for the Protection of New Varieties of Plants, and the branch of law, plant breeders' rights, that falls within its competence have not remained unaffected by these developments and have not been spared by the discussions, despite the fact that most of the questions that have arisen are of sole concern to patent law. The first question of concern to UPOV is whether plant breeders' rights can also provide appropriate legal protection for those varieties that may be developed in future with the aid of biotechnological methods. A further matter of interest for UPOV, to which this document will return in greater detail, is the fact that the patent laws and practice of those countries that grant breeders' rights for plant varieties and also the European Patent Convention, exclude normal patents for varieties and for certain processes for the production of plants. The UPOV Convention indeed contains a corresponding provision. These two areas are demarcated from each other by the provisions of treaties and statutes. In view of developments

UPOV also concerned.

Do plant breeders' rights suffice?

Can the exclusion of plant varieties and certain processes from patent protection be waived?

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[1] See paragraph 1 of the WIPO report of November 5, 1985, BioT/CE/II/2.

[2] For discussions at OECD, see Beier, Crespi, Straus, Biotechnology and Patent Protection, An International Analysis, OECD, Paris, 1985; see also Bull, Holt, Lilly, Biotechnology - International Tendencies and Perspectives, OECD, Paris, 1982.

in biotechnology, the question arises whether that exclusion from patent law still appears justified or whether the corresponding provisions in the treaties and statutes should be amended.[3]

3. UPOV has already been dealing for some considerable time with the area of biotechnology and with the two matters mentioned in the preceding paragraph. In the past, UPOV has organized two Symposia and published the records in four languages. A Symposium on the topic "genetic engineering and plant breeding" was held in October 1982.[4] A further Symposium concerned with "industrial patents and plant breeders' rights - their proper fields and possibilities for their demarcation" was held in October 1984.[5] In addition to which, these matters are dealt with in detail in the internal meetings of UPOV committees.

Two UPOV Symposia on these topics.

Brief characterization of UPOV and the UPOV Convention

4. UPOV, as also WIPO, is an intergovernmental organization, but it is not a specialized agency of the United Nations. The basis on which it acts, the International Convention for the Protection of New Varieties of Plants, was opened for signature on December 2, 1961, and has since then been revised at two diplomatic conferences held in 1972 and 1978, respectively.[6, 7] UPOV comprises a Council formed of representatives of

UPOV is an intergovernmental organization set up by the International Convention for the Protection of New Varieties of Plants of December 2, 1961

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[3] See WIPO report BioT/CE/II/2, paragraph 3, where exclusion is described as no longer being justified, a view that is not shared by the majority in UPOV.

[4] Records of the lectures and discussions: UPOV publication No. 340, in English (E), French (F), German (G) and Spanish (S)

[5] Records of the lectures and discussions: UPOV publication No. 342, in English (E), French (F), German (G) and Spanish (S).

[6] All texts of the UPOV Convention are reproduced in UPOV publication No. 293, including English (E), French (F), German (G); for Spanish see 295 (S).

[7] Records of the basic Diplomatic Conferences of 1957 - 1961, 1972 (in French only), in UPOV publication No. 316 (F), of the 1978 Conference, in UPOV publication No. 337, in English (E), French (F), and German (G).

the members States, headed by the President of the Council, and a permanent secretariat known as the Office of the Union. UPOV and WIPO co-operate administratively on the basis of a formal administrative Agreement.[8] To ensure smooth cooperation, this Agreement stipulates that the Director General of WIPO shall also be the Secretary-General of UPOV.

Administrative cooperation with WIPO; WIPO Director General is also UPOV Secretary-General.

5. UPOV currently has 17 members, mostly European States but also a number of non-European States (United States of America, Japan, New Zealand, Israel and South Africa).[9] The majority of these States are bound by the 1978 revised Act. Although at first glance the number of States that are members of the UPOV Convention would seem small, this should not obscure the fact that UPOV counts amongst its members the greater part of those States in which advanced breeding takes place and in which trade in seed is significant.

UPOV has currently 17 member States.

The UPOV system is applied by most of those countries in which significant breeding and seed trade exists.

6. The UPOV Convention requires the member States to afford protection to plant varieties. Such protection must comply with the rules that are mandatorily prescribed by the Convention. These rules practically determine the essential features of plant variety protection law in the UPOV member States. They concern above all the form of protection, availability of protection to nationals of other UPOV member States or persons having their residence or place of business in such States (national treatment or reciprocity), the requirements for grant and for annulment of rights, the designation of varieties by means of variety denominations and the use of such denominations, priority, scope of protection, term of protection, relationship with other statutory provisions in the seed sector, the testing of varieties, the provision of legal remedies and the authorization to cooperate at international level. The detailed regulation of these matters in the UPOV Convention has led to a degree of harmonization that is very extensive and extremely advantageous to both the users of the system and the economic circles involved. Nevertheless, the fact that the provisions contained in the Convention are simply minimum pro-

The purpose of the UPOV Convention is to afford protection to plant varieties according to mandatory rules.

The UPOV Convention has a considerable harmonizing effect of advantage to both users and concerned economic circles.

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[8] UPOV publication INF/8, in English (E), French (F) and German (G)

[9] The member States are: Belgium, Denmark, France, Germany (Federal Republic of), Hungary, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States of America.

visions means that the States are left sufficient liberty to introduce national regulations that go further, that is to say are more advantageous to the breeder, and which further permit the UPOV member States to adapt to future developments. For instance, the provisions on the duration of protection (15 or 18 years as from grant of protection) represent only a minimum commitment. The provisions on the scope of protection of a variety, which will be described in more detail subsequently in this document, constitute a further example of a minimum ruling that can be expanded by the national lawmaker. Thus, despite its harmonizing effect, the UPOV Convention also posesses great flexibility.

The UPOV Convention posesses great flexibility.

7. Plant breeders' rights can be granted by Patent Offices, just as general patents can, but in most States this responsibility is entrusted to a specific authority within the agricultural administration.

Plant breeders' rights are granted by Patent Offices or special authorities.

8. In the same way as the International Bureau of WIPO, UPOV provides comprehensive information on the legal sector within its competence. Particular mention should be made of two loose-leaf collections that are regularly updated: the five-volume Collection of Important Texts and Documents Established by UPOV[10] and the recently published Collection of Plant Variety Protection Laws and Treaties.[11] Further significant publications already mentioned are the Records of the Diplomatic Conferences and Symposia that have taken place. UPOV likewise publishes a Gazette and Newsletter ("Plant Variety Protection"). All publications are listed in an information brochure.[12]

UPOV publishes extensive information on plant breeders' rights.

Purpose and subject matter of this document

9. This document is intended as UPOV's contribution to the information meeting of January 10, 1986, that has been jointly convened by UPOV and WIPO. WIPO will also submit to that meeting a report drawn up for the second session of the Committee of Experts on Biotechnological Inventions and Industrial Property (document BioT/CE/II/2).

This document is one of the background documents for the information meeting on January 10, 1986.

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[10] UPOV publications Nos. 644 and 645.

[11] UPOV publication No. 651 (in English only).

[12] UPOV publication No. 408, including English (E), French (F), German (G) and Spanish (S).

10. In preparing this document, the Office of UPOV has assumed that on January 10, 1986, the main question to be dealt with will be whether plant breeders' rights and patent protection in their current state of demarcation suffice to provide the necessary incentive for research and development in biotechnology and, in particular, to provide a return on the investments that will have to be made by industry. It has also assumed that a further question, already referred to, will also be dealt with, that is to say whether the exclusion of patent protection for plant varieties and for certain processes for the production of plants is still justified, at least in its current absolute form, in view of the developments in biotechnology. To enable a comprehensive and objective discussion to be held on these matters, this document contains explanations in respect of:

The purpose of this document is to facilitate a comprehensive and objective discussion.

- the field of application of the UPOV Convention,

- the origins of plant breeders' rights,

- various differences in relation to patent law,

- the impact of genetic engineering and biotechnological developments on plant breeders' rights,

- the role of genetic engineering in plant breeding,

- the implications of the patenting of plant varieties for social policy and

- adaptibility of the protection under the UPOV system to new developments.

Additionally, the advantages of protecting new varieties of plants under the UPOV Convention are set out once more. The short period of time available has meant that the Office of the Union was forced to limit its contribution to a small number of elements that it considers essential.

II. THE FIELD OF APPLICATION OF THE UPOV CONVENTION

11. A question that has been raised in recent discussions is that of defining the subject matter of protection of plant breeders' rights to be granted in accordance with the UPOV Conven-

tion and thus also the field of application of the Convention and of the national laws based on it. The Administrative and Legal Committee, entrusted with this matter by the Council of UPOV, reached agreement at its session of November 1985 on the following text:

"THE FIELD OF APPLICATION OF THE UPOV CONVENTION

12. The purpose of the International Convention for the Protection of New Varieties of Plants (in French: Convention internationale pour la protection des obtentions végétales; in German: Internationales Uebereinkommen zum Schutz von Pflanzenzüchtungen) is clear from its title. It is also defined as follows in Article 1 (1):

> 'The purpose of this Convention is to recognise and to ensure to the breeder of a new plant variety or to his successor in title (both hereinafter referred to as "the breeder") a right under the conditions hereinafter defined.'

13. The UPOV Convention specifies its field of application in Article 4(1): it 'may be applied to all botanical genera and species.' However, the terms 'botanical' or 'plant' and (in French) 'végétal', belonging to the same technical area, are not defined and are therefore assumed to have the meaning of 'botanical' as accepted in biological science.

The UPOV Convention applies to all botanical genera and species.

14. Under Article 4(2), 'The member States of the Union undertake to adopt all measures necessary for the progressive application of the provisions of this Convention to the largest possible number of botanical genera and species.' Many of them satisfy this undertaking by drawing up a list of the genera and species (and other taxonomic units) whose varieties are eligible for protection. Those lists show that in practice the States apply the Convention mainly to agricultural plants, vegetables, fruit crops, ornamental plants and forest trees.

The UPOV Convention is mostly applied to agricultural plants, vegetables, fruit crops, ornamental plants and forest trees.

15. Those States which intend to limit protection to those categories of species, without listing the species concerned by name, proceed as follows: they declare all species of plants, with the exception of certain categories, to be eligible for protection. Thus, in New Zealand, for example, the law applies to 'all varieties and species of plants other than fungi, algae and bacteria.' In the United States of America, the Plant Variety Protection Act applies to 'any novel variety of sexually reproduced plant (other

than fungi, bacteria, or first generation hybrids).' Those States have logically considered the latter categories of living matter as plants.

16. Other member States, however, do apply the Convention to the latter categories of plants where the need arises. Japan, for example, now protects 12 species of edible mushrooms (i.e. all mushrooms cultivated in that country as varieties or--to use mushroom growers' terminology--strains) and two species of algae. The Netherlands protects the common mushroom (the genus Agaricus) and other European States intend to do the same.

Also applicable to other categories of plants. Japan and the Netherlands protect mushrooms and Japan also protects two species of algae.

17. The plant varieties that have so far usually been covered by the plant variety protection system are those in which there are breeding activities, of which propagating material is marketed and for which there was a need for protection. However, the Convention is open to other botanical species, should a need for such protection arise.

The UPOV Convention remains open to further botanical species in which there are breeding activities.

18. The European Patent Convention, that has been used as a model by numerous States, refers in its Article 53(b) to plant or animal varieties or essentially biological processes for the production of plants or animals with the exception of microbiological processes and their products. Patentable inventions in the biological field and plants eligible for plant variety protection cannot be clearly distinguished by means of scientific criteria but must be assigned to either one of the systems of protection by legislative decision.

The demarcation between inventions and plants eligible for plant breeders' rights is a matter for legislative decision.

III. THE ORIGINS OF PLANT BREEDERS' RIGHTS

Developments up to the Diplomatic Conferences of 1957 to 1961

19. Plant breeders' rights have been introduced in numerous countries over the preceding decades on the basis of the UPOV Convention, that constituted the completion of years of efforts on the part of the European plant breeding industry to obtain protection for the results of breeders' work and of the investments they had made, and on the basis of comparable developments in the

The UPOV system based on the UPOV Convention is the outcome of many years' efforts to obtain industrial property protection for new plant varieties.

United States of America[13], as a special type of protection that gives breeders of new plant varieties the possibility of obtaining exclusive rights for their varieties comparable with patents for industrial inventions. The Convention requires that such plant breeders' rights be granted under domestic law either in the form of patents, that must be specially adapted to the mandatory provisions of the Convention, or in the form of special rights or certificates, or even both forms.[14]

The UPOV system comprises the grant of plant breeders' rights in the form of a special title of protection or of an adapted patent (plant patent).

However, it is not permissible to offer both forms of protection for varieties of the same botanical species, i.e. for varieties that compete economically.[15] For reasons of simplicity, this system of protection is sometimes referred to in this document as the "UPOV system." The majority of UPOV member States have chosen to grant special rights or certificates; only Hungary, Italy and - in part - the United States of America grant plant breeders' rights in the form of specially adapted patents (plant patents). As a result of the introduction of the UPOV system in addition to the patent system, the European Patent Convention and the domestic patent laws of most UPOV member States, as already briefly mentioned, have explicitly excluded plant varieties from protection under patent law and most of them have also excluded the granting of patents for essentially biolog-

Exclusion of patent protection for plant varieties and essentially biological processes for the production of plants.

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[13] In 1930 already, developments in the United States of America led to the promulgation of the Townsend - Purnell Plant Patent Act under which patents of a special kind (plant patents) are granted by the Patent Office for the asexual reproduction of new plant varieties (excepting tuber plants, basically potato and Jerusalem artichoke); this Act was supplemented in 1970 by the Plant Variety Protection Act under which certificates are granted for varieties of "most" sexually reproduced plants.

[14] The possibility of affording protection in both forms was simply given to enable States to adopt transitional measures in those cases where they had in the past afforded patent protection in some form or other and had subsequently decided to progressively apply the UPOV Convention. This possibility has taken on no practical significance (see, however, footnote 15 as regards the United States of America).

[15] See Article 2(1) of the UPOV Convention. Alone, the United States of America has reserved its right, by means of notification under Article 37 of the 1978 text of the Convention, to grant protection for varieties of the same species under both of the forms of protection referred to in Article 2(1) of the Convention. In the United States of America, Plant patents are granted for asexually reproduced varieties whereas plant variety certificates are granted for sexually reproduced varieties.

ical methods of plant breeding.[16] Likewise, in other UPOV member States, in which no such explicit exclusion as yet exists, general patents are not normally granted for plant varieties and certain processes for the production of plants.

The drafting of the UPOV Convention at the Diplomatic Conferences of 1957 to 1961

20. The UPOV Convention was drawn up in a Diplomatic Conference that held two sessions between 1957 and 1961 and was the outcome of intensive and lengthy debates.[17] Its origin had been the wish of plant breeders to obtain legal protection for the fruit of their work that would correspond to the protection already enjoyed by inventors for the results of their research and development. The breeders had already been pressing for some considerable time for the right to obtain legal protection for their newly bred varieties or for certain processes for obtaining those varieties, but they had met with great difficulties in numerous countries.[18] Although occasional patents were subsequently granted in a small number of countries, problems nevertheless arose in asserting the rights deriving from those patents. The general type of patent proved ineffective in respect of those persons who - as is normal practice - simply reproduced the variety. In whatever form patent protection was afforded (in the form of a product patent or a process patent), protection never went beyond the direct product of the breeding process (the basic seed).[19] The aims of the breeders in

The UPOV system was introduced because the general patent system had proved inadequate for protecting plant varieties.

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[16] See Article 53(b) of the European Patent Convention. A counter exception is made for microbiological processes or the products thereof. As far as domestic laws are concerned, it should be noted that the Federal Republic of Germany and France do not exclude varieties of species for which plant variety protection is not (as yet) available.

[17] See B. Laclavière in "The Convention of Paris of December 2, 1961, for the Protection of New Varieties of Plants and the International Union for the Protection of New Varieties of Plants," Industrial Property, 1965, pp. 224 et seq.

[18] Beier, Crespi, Straus, op. cit., with further references, pp. 21 to 36.

[19] For the very comprehensive literature on this question in the Federal Republic of Germany, see: Krause/Kathlun/Lindenmaier (Ulrich Weiss), Das Patentgesetz, Carl Heymanns Verlag KG, Berlin, Bonn, Munich, 5th edition 1970, note 18 on paragraph 1 (pp. 17 to 19), with further references. Differing opinions are expressed by Freda Herzfeld-Wuesthoff in Der Züchter, 1932, pp. 203 et seq., and recently by von Pechmann in GRUR, 1985, pp. 717 et seq.

their continued efforts to obtain effective protection were then taken up by experts in the field of industrial property - lawyers, patent attornies and civil servants - who had perceived the need for such protection, particularly in order to promote breeding activities for the benefit of agriculture as a whole. Experienced specialists in industrial property indeed played an outstanding part, in addition to the agricultural specialists, in the Diplomatic Conferences that took place between 1957 and 1961. They were frequently the same specialists that had also participated in such successful projects as the European Patent Convention and the various patent agreements drafted in the Council of Europe. The frequently repeated criticism that the UPOV Convention was drafted by people without sufficient knowledge of patents can therefore be rejected. The UPOV Convention was indeed drawn up by outstandingly qualified experts from both the agricultural and the patent sectors and this is indeed one of the reasons why it has proved flexible enough for the demands placed upon it during a quarter of a century and why its essential provisions have not required substantive amendment in the two Diplomatic Conferences that have since taken place, that is to say in 1972 and 1978.

The UPOV system was drawn up by leading experts in the field of agriculture and in the field of patents.

The UPOV system has proved sufficiently flexible to meet all demands over a quarter of a century.

IV. VARIOUS DIFFERENCES IN RELATION TO PATENT LAW

The grounds for setting up a specific type of protection

21. The authors of the UPOV Convention, closely involved in patent law,[20] finally found no other possibility than to set up an independent system of protection since the patent system, developed over the years, was unable to adequately cover plant varieties. More recent publications point to the following aspects as having constituted the main obstacles to patent protec-

The basic concept on which general patent law rests is not well suited to the protection of plant varieties.

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[20] See list of participants at the second (final) session of the Diplomatic Conference in 1961, that drafted the final wording of the UPOV Convention: it includes a head of patent office, an inspector general of the French department responsible for patent law, who subsequently became Director General of the International Patent Institute in The Hague, a president of an appeal board of a patent office, two highranking officials and various junior officials of Ministeries responsible for patent law.

tion at that time: the hesitation to grant patent protection for living matter or products of Nature (at least in some parts of the world), the difficulty of describing plants or plant varieties and of repeating with the necessary accuracy the processes that lead to new plant varieties (above all in Europe). These considerations certainly played a great part. The lack of suitability of the general patent system for protecting plant varieties was nevertheless of a more basic nature and its roots were deeper. It was indeed the overall concept of the general patent system that made it unsuitable, as indeed it still is, for the protection of plant varieties, that is to say for a group of plants that essentially comprise the same expressions of characteristics that can be passed on in propagation to successive generations of plants, and that are used in commercial agriculture for that purpose. This basic, and continuing, defect in general patent law, that made it necessary to introduce a specially adapted system, can be best demonstrated by comparing detailed aspects of the UPOV system with those under the general patent system, which is indeed the aim of the following paragraphs. It should be noted that such a comparison frequently proved laborious in view of the lack of uniformity of patent laws, that are harmonized only in respect of isolated aspects or only on a regional basis, and of the patent case law in differing countries. Thus, it is not possible to make statements with the same degree of certainty for general patent law and patent practice as can be done for the law of plant breeders' rights that has been extensively harmonized under the UPOV Convention.

The basic concept of protection

22. As already mentioned, there are differences in the basic concept. Patents are granted for inventions whereas breeders' rights are granted in respect of certain new varieties (in the French version of the Convention for "obtentions végétales"). The subject matter of the patent system is essentially a teaching for a technical act leading to a technical solution.[21] An inventor discloses to the public the teaching for a technical act, which competitors would be able to copy if they were not prevented from so

The UPOV system protects plant varieties and not a teaching for a technical act.

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[21] "Teaching for a technical act," see G. Benkard, Patentgesetz, Gebrauchsmustergesetz, 7th edition, Munich 1981, note 44 on paragraph 1.

doing by an exclusive right afforded to the inventor for a specific term in the commercial field. A breeder gives to the public a new variety which has economic value for himself and for others since it can be reproduced, just as it is, by using well-known biological reproduction processes; the breeder's competitors have no interest in repeating the breeding process that has led to the variety; they wish to reproduce material of that variety for the purposes of trade and the exclusive right afforded to the breeder therefore basically covers the authorization to produce such propagating material for the purposes of commercial marketing, that is to say the essential act of exploitation in respect of plants. The exploitation of an invention means that the user repeats what the inventor has done in order to achieve the subject matter of the invention whereas the user of a plant variety is interested in the reproduction of the finished variety; he is interested in utilizing its natural capacity to reproduce itself.

The aim of protection under the UPOV system differs essentially from patent protection: plant breeders' rights prohibit others from exploiting the variety's capacity to reproduce itself.

The protection of discoveries

23. Plant breeders' rights may also be granted for discoveries, whereas general patents cannot. The UPOV Convention explicitly stipulates that all plant varieties, meeting certain requirements, may be protected irrespective of their origin.[22] The merit of the breeder is to have created a new and useful variety and to have made it available to society. It therefore would appear absolutely necessary to include discoveries since a large number of valuable new varieties are obtained by the selection and reproduction of plants that owe their existence to a spontaneous mutation (that is one which has not been artificially obtained and is therefore not repeatable at will, at a given moment). The finding of such mutants would not be protectable without the UPOV system, thus without this system there would be no protection for some new plant varieties.

The UPOV system also protects discoveries.

Requirements for protection

24. Considerable differences may also be ascertained in the requirements that have to be met if protection is to be given.

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[22] See Article 6(1)(a) of the UPOV Convention: "Whatever may be the origin, artificial or natural, of the initial variation from which it has resulted, ..."

(a) Patent law novelty and non-obviousness and the corresponding requirements under the UPOV system

25. The requirements for granting patent protection are basically novelty and inventive step (or level of inventiveness or non-obviousness), together with industrial applicability. They cannot be used in this form for plant varieties, since they would have no significance, whereas other requirements that are indispensable for the protection of such varieties are foreign to patent law. In order for plant breeders' rights to be granted, it is not necessary that the variety should be new and non-obvious (inventive) when compared with a theoretical prior art, which itself may comprise various components of knowledge (mosaic-like prior art). Plant varieties, on the other hand, must be clearly distinguishable by one or more important characteristics from any other - individual - variety whose existence is a matter of common knowledge. They are therefore compared with actual, existing varieties. Protection cannot be refused for a variety if some - or even indeed all - of its characteristics are to be found in various other known or even protected varieties, but never altogether in the same single variety. It is also sufficient for a clear distinction to exist in at least one important characteristic irrespective of whether the breeding of a variety with such expression of a characteristic was obvious or not for an average specialist. Whether or not clear distinctness exists in an important characteristic is thus assessed against an objective yardstick. It is quite unimportant whether another breeder with average knowledge could have bred that variety or not. What is important is that agriculture, horticulture or forestry should gain a new variety and not whether the breeding is judged to be inventive or non-obvious.

The normal patentability requirements are not suited to plant varieties.

The UPOV system sets other - indispensable - requirements for grant.

The requirement of distinctness under the UPOV system.

(b) The special rule under the UPOV Convention as regards the notoriety of the variety itself

26. A specific, interesting feature of the UPOV system is constituted by the rules on novelty where the variety itself is disclosed prior to the date of the application for protection. Under the patent system, any publication of an invention, even by the inventor himself, destroys its novelty. Relatively short "periods of grace" alone are available to prevent the inventor losing his entitlement to a patent where he has himself disclosed it, for instance to the scien-

Differing rules on novelty under the patent system and the UPOV system.

tific world, before filing an application, despite the importance the disclosure might have for scientific progress. Under patent law, there was even a tendency for a while to reduce the length of such periods of grace or to do away with them altogether and it has only been recently - significantly, in conjunction with other living matter, that is to say microorganisms - that there have been demands for extending the length of the periods of grace.[23] The UPOV system, which is not bound to the model of general patent law, has adopted in this case a system unfamiliar to the patent lawyer, but which could indeed be worth copying when applying the patent system to microorganisms. The fact that the variety itself is already a matter of common knowledge is removed from the strict rules on distinctness. The variety itself can therefore already have been disclosed, it can already have become a matter of common knowledge, e.g. communicated to scientific circles; it can also have been registered for any type of purpose or can have been shown at an exhibition. The only prohibition is that of having already been commercially marketed (with the agreement of the breeder or his successor in title) in the State in which the application is filed (and, even in this case, the most recent version of the Convention (1978) permits a period of grace of up to one year). The authors of the UPOV Convention considered that the simple fact that the variety is known should not prevent protection since it did not mean that the general public had access to the variety; simple knowledge of a variety would place no-one in a position to reproduce the variety or its material. Indeed, no-one could reproduce a variety on the sole basis of its disclosure. Protection is only excluded if the variety has been commercially marketed and therefore material is to be found on the market, since users of the variety acting in good faith could find themselves subsequently faced with an exclusive right and a prohibition. In other words, the differing situation that exists in the case of plant varieties made it possible for the legislators to devise a rule that is less stringent than the rules of the patent system, and the special situation of those breeders who are required in a number of countries to make their material available at a very early juncture for official trials for other reasons indeed made this lack of stringency almost compulsory. The rules laid down under the UPOV system in the

A specific provision to prevent the loss of novelty in the case of premature disclosure. The rapid exchange of information is thereby facilitated.

Generous periods of grace under the UPOV system.

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[23] Beier, Crespi, Straus, op. cit., p. 97.

case of commercial marketing of the variety in another country are even more generous. Marketing abroad is only damaging to novelty if it took place more than four years - and in some cases even six years - prior to the filing date. These rules on novelty under the UPOV system are extremely advantageous to breeders seeking protection.

The rules on novelty of the UPOV system offer the breeders considerable advantages.

(c) The requirement of industrial applicability has not been adopted by the UPOV system

27. The patent law requirement of industrial applicability would have no meaning for plant varieties and was therefore not maintained under the UPOV system. Although there is no doubt that plant varieties are always industrially applicable, it can nevertheless not be excluded that application of general patent law in this respect would lead to systematic legal problems in a number of countries.

Systematic legal difficulties have been avoided by excluding those general patent law requirements that are meaningless for plant varieties.

(d) The requirement of sufficient homogeneity under the UPOV Convention

28. On the other hand, a plant variety must satisfy the requirement of sufficient homogeneity under the UPOV system if it is to be protected. This requirement is unknown under patent law, but is indispensable for plant variety protection. Here again, there exists a clear difference between the two systems. UPOV is dealing with living matter and living matter is never identical; each plant differs from every other plant. On the other hand, it is clear that an exclusive right can only be granted for a group of plants that are sufficiently different from another group of plants. Otherwise, it will not be possible to determine the scope of protection or to prove infringement of a right. Therefore, a system of protection for plant varieties must be based on a group of plants which possess such a degree of similarity to each other that they can be distinguished from other groups of plants. That then constitutes a "sufficiently homogeneous variety." It is therefore necessary to require a certain homogeneity as a condition of protection; however this homogeneity is not only required for protection. Whenever the legislator establishes rules for plant varieties (for entry in national catalogues, for certification and the like) homogeneity plays an important part. It is an essential element of the concept of a variety. General patent law is therefore lacking in an essential requirement for determining the protected subject matter. Without homogeneity there would be considerable difficulties in

Sufficient homogeneity: an essential requirement for plant variety protection.

defining protected varieties in such a way that they could be included in the search files, as is common in patent law, in order to assess other varieties for which protection was subsequently sought.

(e) Stability under the UPOV Convention

29. What has just been said about homogeneity also applies to a further requirement under the UPOV Convention, that is to say to the requirement of stability. Plant varieties must be stable. They must be capable of passing on their characteristics to subsequent generations. This is an absolute necessity from a number of points of view. From a practical point of view, it is essential that users obtain plants of the same kind when material of the protected variety is reproduced. From a legal point of view, it is clear that an exclusive right can only be asserted if the plant variety maintains over the years the essential characteristics as described when the rights were granted.

Variety stability: a further essential requirement for variety protection.

Forfeiture of protection under the UPOV Convention

30. The need for plant varieties to possess sufficient homogeneity and stability in their essential characteristics is also reflected in the provisions on the forfeiture of rights that have been granted. A particularity of the subject matter of plant breeders' rights, that is to say the plant variety, is that it can disappear if it loses its essential expressions of characteristics. Patent law has nothing to cover this situation. The UPOV system makes allowance for this possibility. If the breeder does not maintain the variety or if such activities are unsuccessful and he is therefore no longer in a position to provide the competent authority with reproductive or propagating material for producing the variety with those characteristics that were decisive for the grant of protection, then the UPOV system provides for forfeiture ex nunc (at the request of a third party or ex officio). The plant breeders' rights then lose their effect, but remain fully effective in respect of the past, that is to say for the period preceding the declaration of forfeiture.[24] A retroactive declaration of nullity

The UPOV system has its own specific arrangements for the forfeiture of the rights protected.

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[24] See Article 10 (2) of the UPOV Convention. For examples of the invalidation of patents, see Sections 158 and 159 of the WIPO Model Law for Developing Countries on Inventions, Volume I, Patents, WIPO publication No. 840 (E), WIPO, Geneva 1979, pp. 40 and 41.

(ex tunc) is provided for under the UPOV Convention but only if it is shown that the variety was not distinct and was not new at the time of granting already.

Retroactive annulment only in the event of a lack of distinctness and novelty.

Various differences in the grant procedure

(a) The description and the growing tests

31. Considerable differences exist between the two systems in respect of the grant procedure. First, as regards the application. A considerable portion of the application for a general patent is constituted by the specification, that is to say the description of the invention.[25] Patent applicants describe their inventions in normal language or by means of formulae and symbols used in the relevant technical field, as for instance the generally known chemical formulae. Even under general patent law it is not always easy to describe an invention adequately. The description of an invention in the field of macromolecular chemistry causes considerable problems, but living organisms present even greater problems. Those problems that have arisen in the field of microbiological inventions demonstrate this quite clearly. The UPOV system is dealing with a subject matter that is even more complicated, with living organisms of much greater complexity and of almost unlimited variability. Additionally, a system of symbols, such as that used in chemistry, is almost entirely lacking. During the last two centuries, in particular, the scientific discipline of botany has concerned itself intensively with the description of plants at the level of species and higher botanical orders.[26] The description of plant varieties by means of words and phrases is sometimes impossible and is always inadequate with the result that over the centuries botanists have made use of drawings and colored illustrations. Photography is available nowadays (but

The UPOV system provides a solution to the problems that arise in describing living matter.

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[25] E.g, see Section 123 (3) of the WIPO Model Law for Developing Countries on Inventions, Volume I, Patents, WIPO publication No. 840 (E), WIPO, Geneva 1979, p. 23, and in particular the comments on this provision on p. 71.

[26] Hervé M. Burdet, The De Candolle Family and the Historical Development of Botanical Nomenclature, Records of the UPOV Symposium on Nomenclature held in October 1983, UPOV publication No. 341 (E), Geneva, 1984, pp. 11 et seq.

it does not always show the correct color).[27] Pressed plants, such as those used in herbaria, offer a further possibility for defining plants. However, botanists are quite aware that in the final count only living samples of a plant can ensure exact description. In the Botanical Garden in Geneva, the following Latin inscription may be found: "Herbarium praestat omni icone, natura viva praestat omni herbario." The UPOV Convention respects the above findings of the botanists. It explicitly provides that protection shall only be granted following examination that the technical requirements of distinctness, homogeneity and stability have been satisfied.[28] The aim of the drafters of the UPOV Convention was that the examination should be carried out in the form of growing tests.[29]

Descriptions are supported under the UPOV system by living material.

The UPOV system comprises an examination of the living matter.

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[27] When examining plants, international color charts are used, for instance that published by the Royal Horticultural Society. The Technical Committee of UPOV endeavors to harmonize the utilization of color charts in the member States.

[28] Article 7 of the UPOV Convention.

[29] In most States, the growing trials are carried out at official institutes and in other States the official examination is based on trials carried out by the applicant himself. The mandatory requirements are set out in the Records of the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants, 1978, UPOV publication No. 337 (E), UPOV 1981, p. 25. The statement reads as follows:

"(1) It is clear that it is the responsibility of the member States to ensure that the examination required by Article 7(1) of the UPOV Convention includes a growing test, and the authorities in the present UPOV member States normally conduct these tests themselves; however, it is considered that, if the competent authority were to require these tests to be conducted by the applicant, this is in keeping with the provisions of Article 7(1), provided that:

"(a) the growing tests are conducted according to guidelines established by the authority, and that they continue until a decision on the application has been given;

"(b) the applicant is required to deposit in a designated place, simultaneously with his application, a sample of the propagating material representing the variety;

"(c) the applicant is required to provide access to the growing tests mentioned under (a) by persons properly authorized by the competent authority.

"(2) A system of examination as described above is considered compatible with the UPOV Convention."

As a result, the demands placed on an applicant seeking plant breeders' rights differ from those placed on an applicant for a patent. The applicant for plant variety protection is not expected to produce an exact description as understood in general patent law. In fact, he submits simply a general description containing a small number of statements concerning the essential differences between his and other varieties.[30]

Additionally, in most UPOV member States, the applicant must submit a small quantity of propagating material to the examining authority. In such States, the material is examined by the authorities in comparison with other varieties. Where plant breeders' rights are granted, it is the Office (in most member States) and not the applicant that draws up the final description. Further, following grants of rights, samples of the protected variety are kept by the granting authority to enable it, should infringements be reported, to compare the protected variety and the material used by the alleged infringer, in further growing trials. It is obvious that this system presents a number of advantages. To begin with, it is a safe system, and possibly the only feasible system, for testing and accurately describing a variety. In the examination carried out by the Office itself (as is the case in most UPOV member States), the breeder is also relieved of the task of describing the variety, in respect of which he would otherwise have to maintain reference collections involving considerable expense, since a variety can only be described with the help of such collections in relation to one or more other varieties. Obviously, such a procedure is not cheap and is also not rapid (the examination usually extends over between one and three growing periods, i.e. mostly between one and three years), but it must also be taken into account that this avoids expensive legal disputes in most cases. Additionally, the system constitutes a good basis for the exchange of examination results between authorities of varying contracting States where the breeder also seeks protection in those other States. This type of exchange saves not only time and money, but also avoids the risk of various Offices taking differing decisions; this is of special significance in view of the extensively international nature of trade in seed.

The deposit of samples of propagating material of the variety saves extensive descriptions.

The Offices keep samples; these can be used to obtain evidence in infringement proceedings.

Ensures reliable descriptions.

Avoids expensive legal proceedings; facilitates cooperation between Offices.

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[30] The form on which these statements are to be made ("Technical Questionnaire") is annexed to the UPOV Test Guidelines for each species. A model is contained in UPOV publication No. 644 (E), section 12.

32. It is true, of course, that under patent law a description may be replaced by a deposit under certain circumstances, particularly in the case of living matter such as microorganisms. However, the purpose of such a deposit is a different one. In practice, it more or less replaces the description, meaning that on the grant of a patent the subject matter is not described in such a way that others may reproduce it, but must subsequently be determined in each individual infringement proceeding. On the other hand, the variety description drawn up on the basis of the sample submitted and the examination carried out to obtain plant breeders' rights means that the subject matter of the rights is clearly defined from the very outset.

Under the UPOV system, the deposit of samples and the examination lead to a clear definition of the subject matter of the rights.

Variety denominations

33. A further condition to be met under the UPOV Convention is that the applicant has to submit a variety denomination that meets the requirements of the Convention. In view of the above-mentioned particularities in the description of plants, it is important to ensure that reference may be reliably made to plant varieties by means of special denominations that are uniform throughout the whole UPOV area. Both the Convention and corresponding administrative measures ensure that, as far as possible, only one denomination exists throughout the whole UPOV area for a given protected variety. The UPOV Convention further stipulates that any person who, in a member State of the Union, offers for sale or markets reproductive or vegetative propagating material of a variety protected in that State shall be obliged to use the denomination of that variety, even after the expiration of the protection of that variety. This ruling was held to be essential in the general interest.[31] Variety denominations constitute a necessary means of identification. General patent law, on the other hand, provides no means of identification, even in the case of living matter. To avoid misunderstandings, it should be noted here that the rules on denominations under the UPOV Convention do not exclude parallel utilization of trademarks. Trademarks (and other such signs) may be used in conjunction with a variety denomination.

The UPOV system comprises a reliable system of designation to facilitate identification of varieties.

Under the UPOV system, a variety normally bears the same denomination in all UPOV States.

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[31] Article 13(7) of the UPOV Convention.

Priority

34. As under the general patent system (Paris Convention for the Protection of Industrial Property), the UPOV Convention provides that the priority of an earlier application, filed up to twelve months before in another UPOV member State, can be claimed. In this case, however, the fact that the UPOV system deals with living matter gives reason for a variant ruling. It is possible in individual cases that the breeder who files applications in the various countries in which he is seeking protection does not have available a sufficient quantity of seed or material for the examination. The UPOV Convention therefore gives him an additional period of four years following expiry of the priority period for submitting material to the Offices with which he has filed subsequent applications.

The UPOV system provides a right of priority adapted to the needs of the breeders.

Scope of protection

35. Differences between the UPOV Convention and general patent law arise in respect of the scope of protection. To begin with, the UPOV Convention has the great advantage of containing clear rules for the obligatory scope of protection. Although the scope of protection under patent law is described very comprehensively, the answer to the question of the conditions under which patent protection is exhausted has to be based on court decisions and is particularly problematic in the case of the matter resulting from self reproduction, where utilization primarily comprises the use of successive generations. The UPOV Convention gives a clear answer in this case. It stipulates that variety protection shall have effect for each reproduction for the purposes of commercial marketing of propagating material and for any marketing of propagating material.

The scope of protection under the UPOV system is fixed by clear, but nevertheless flexible, rules adapted to the nature of the subject matter.

36. Furthermore, the scope of protection under the UPOV Convention is flexible and therefore of advantage in an area where unforeseeable developments must be allowed for. To begin with, the Convention contains rules on the minimum scope of protection, i.e. a degree of protection that is mandatory for every member State. This minimum scope of protection comprises, as already briefly mentioned:

Minimum scope of protection.

- the production of reproductive or vegetative propagating material for purposes of commercial marketing of the material as such;

- the offering for sale and marketing of reproductive or vegetative propagating material as such.

The UPOV Convention is flexible in that it permits the member States to go beyond this minimum scope of protection and to grant more extensive rights, particularly to extend protection to the "marketed" or final product.[32] The member States are thus given the possibility of adapting the scope of protection if that is required by a special situation in one of those States or by development.

Member States may extend scope of protection where developments so require.

37. As far as the minimum scope of protection is concerned, it may be noted that this is less than the protection offered under the patent system since it does not normally cover the production of propagating material of a protected variety that is not marketed as such (i.e. as propagating material), but is used on the producers' own land (sown or planted) in order to obtain material for consumption. Where the scope of protection has not been extended, there is nothing to prevent a farmer or horticulturalist from saving part of the crop of the protected variety in order to sow it or plant it on his own land in the following growing period. (An exception exists in respect of the use of material for producing cut flowers or ornamental plants.) The possibility of "saving seed" is of great importance for agriculture and it is doubtful whether it would be politically feasible at present to restrict this right in all countries. The assertion of the right to prohibit under general patent law would probably lead to serious political difficulties.

Rules in respect of the minimum scope of protection permit farmers to "save seed of a protected variety" for sowing in the following growing period.

The scope of protection under general patent law could lead in some countries to conflicts with the interests of the users.

38. As already mentioned at the beginning of this section, the scope of protection under the UPOV Convention also quite clearly ensures, on the other hand, that every reproduction for the purposes of marketing propagating material as such and any marketing of the propagating material itself is subject to the right to prohibit afforded to the owner of the plant breeders' rights. Under the general patent system, the principle of exhaustion would lead to some doubt particularly where the patented subject matter had been put into circulation by the patentee himself. Protection would miss its mark, however, if the owner were not able to prevent commercial production of propagating material for

Even the minimum scope of protection under the UPOV Convention provides full protection against the production of seed and other propagating material by unauthorized persons.

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[32] Article 5(4) of the UPOV Convention.

the purposes of marketing and marketing itself. The clear ruling given by the UPOV Convention therefore constitutes a valuable and indispensable guarantee for the breeder.

39. The rules under the UPOV Convention in respect of the scope of protection contain a further basic provision, that is to say the requirement that use of a protected variety as basic material for creating a further variety and the marketing of such further variety does not require the consent of the owner of the plant breeders' rights in the original variety (Article 5(3) of the UPOV Convention). The principle of dependent protection, as existing under patent law, was therefore intentionally left out of the UPOV Convention since the crossing of varieties, the main case in which this provision is made use of, creates a new genetic combination representing a new independent object for protection. Had the dependency principle embodied in the general patent law been incorporated in plant breeders' rights law, it would have applied to almost all varieties since new varieties can only be bred from existing material. Even when genetic engineering methods are used, this is still the case since a variety can never be completely built up from artificial genes, but in all cases it is an existing variety into which a different gene or different individual genes are inserted. This operation differs in its principle in no way from the insertion of additional genes into an existing variety by crossing it with a different variety. Dependency in accordance with general patent law would also present an obstacle to the free exchange of genetic resources.[33] The institution of compulsory licenses along the lines of general patent law would not constitute a feasible remedy for this problem.

The UPOV system guarantees the freedom to develop improved varieties on the basis of existing varieties.

The UPOV system guarantees that genetic resources remain freely available for plant breeding.

The legal quality of the UPOV system

40. The preceding survey of the essential differences between the UPOV system and patent law explains why the drafters of the UPOV Convention designed it as a seperate type of protection. It shows that, even from today's point of view, the UPOV system in no way constitutes ancillary protection of lower quality than that of patent

The UPOV system constitutes an equivalent system of legal protection comprising progressive elements.

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[33] Compare FAO Resolutions 8/83 and 9/83.

law, but in fact contains particularly progressive elements in respect of living matter which as yet have no equivalence in patent law.

Particularities of the patent system that would be difficult to apply to plant varieties

41. The patent system comprises particularities that show that it would be difficult to apply it, in the way in which it has developed, to plant varieties.

Various recent developments in the patent system cannot be applied to plant varieties.

42. A very positive development has taken place recently in the patent system, that is to say the establishment of extensive international and regional cooperation. An example of such international development is given by the Patent Cooperation Treaty (PCT).[34] Under the PCT, a patent application that has been filed in one country can obtain effect for a number of other countries throughout the world and the invention constituting the subject matter of the application is subjected to a centralized search, and in some cases even to a preliminary examination, at specific Offices. To mention also an example of such developments at regional level in Western Europe (but extending beyong the European Communities), mention can be made of the setting-up of the European Patent Office and of the fact that the Convention, on which this Office is based, provides for the grant of European Patents having the effect of national patents in the contracting States. Additionally, a convention for a European patent for the Common Market has been drafted (but has not yet entered into force) in respect of a European Community Patent having unitary effect. It would be difficult to apply these provisions to plant varieties. They react in different ways to environmental factors existing in various countries, for example the differing intensity of the sun's radiation or a different length of day. In some cases this even causes problems within one and the same State, particularly where this streches over climatic boundaries. It could prove difficult to adopt in one country the results of the examination of a plant variety carried out in a State located in a different climatic zone. UPOV itself acts to achieve cooperation between Offices,

International cooperation as provided for in the patent system is not always feasible for plant varieties because they are subject to environmental factors.

UPOV provides for suitable cooperation between the Offices of the member States.

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[34] Patent Cooperation Treaty (PCT), signed in Washington on June 19, 1970, supplemented on October 2, 1979, and amended on February 3, 1984, WIPO publication No. 274 (E).

particularly in the examination of varieties, and also plans in suitable cases to centralize examination. However, this is being done with great caution. Cooperation is currently organized on the basis of bilateral agreements between authorities.[35] It is limited to a number of carefully chosen species for which the problems that arise as a result of environmental differences are not to be expected in the cooperating countries. This example again shows that plant varieties are subject to special conditions.

V. THE IMPACT OF GENETIC ENGINEERING AND BIOTECHNOLOGICAL DEVELOPMENTS ON PLANT BREEDERS' RIGHTS

Alternative application of the general patent system and of the UPOV system

(a) "Two-way" protection leads to legal uncertainty

43. Recent demands that the exclusion of plant varieties and certain processes for the production of plants from the general patent system be lifted and that the applicant be given the choice of seeking protection for his variety by means of a general patent or plant breeders' rights, cannot be endorsed. Under such a "two-way" system of protection - particularly one that permitted cumulative double protection - the differences in the conditions and implications (scope of protection) described above would lead to overlapping and create an inextricable situation as regards rights in a specific area (that of plant varieties). The basic differences between plant breeders' rights law and patent law, that could lead to such an impossible situation, are primarily the requirements for the grant of rights, the differing way in which examinations are carried out, the fact that the grant is made by different authorities possessing differing examination material, the differences in identifying the protected varieties and the differences in their description. Mention should also be made of the uncertainty that would be created in the agricultural area as regards the right to use material produced on the farmer's own land

"Two-way" protection by plant breeders' rights and patents would jeopardize legal security.

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[35] The bilateral agreements are based on the UPOV Model Administrative Agreement for International Cooperation in the Testing of Varieties, reproduced in section 19 of the UPOV Collection of Important Texts and Documents, Part I, UPOV publication No. 644 (E).

for the production of consumption material. The legal uncertainty for outsiders created by all these differences was indeed the main reason for which such "two-way" protection was explicitly excluded in the European Patent Convention and in numerous patent laws that followed it. The outcome of renewed admissibility of patent protection in addition to plant breeders' rights and the resultant legal uncertainty could well do considerable damage to the general reputation of industrial property protection as an important legal institution of society. Indeed, energetic exploitation of the possibilities offered by such "two-way" protection could provoke a highly critical review of the industrial property system as a whole.

"Two-way" protection would damage the reputation of industrial property as a whole.

(b) Exclusion of plant varieties from patent protection outside UPOV

Plant varieties are also excluded from the patent system outside UPOV.

44. It should also be taken into account that States throughout the world, including those not bound by the UPOV Convention or the European Patent Convention, exclude plant varieties from patent protection. These are countries spread across the various continents - South America, Asia, Africa and Europe - and also with differing economic systems. It is practically a general principle that plant varieties may not be protected under general patent law and are either left without protection or enjoy a specific legal system. Argentina, Chile, the German Democratic Republic (which indeed possesses a system of plant breeders' rights that is fully compatible with that of UPOV), Yugoslavia, Zimbabwe and recently China all constitute examples.

(c) An additional possibility for patent protection of plant varieties is unnecessary

No need to open up or reopen the patent system for plant varieties; plant breeders' rights are available for all varieties whatever the way in which they have been created.

45. Furthermore, there is indeed no need to open up the general patent system for plant varieties. All plant varieties, including those created with the aid of genetic engineering, can be protected by plant breeders' rights. The use of a single protection system rather than of two parallel systems for protecting plant varieties ensures that the seed industry and also the producers, traders and users (for whom the way in which a variety has been created, with or without the aid of genetic engineering, in a manner that is proven to be repeatable or not, is of no significance) have one single system of protection to deal with. Varieties developed by genetic engineering (should this prove possible in the future) and other varieties - that compete on the market on the same terms - are dealt with in

the same way; the same rights and rules exist for their invalidation. The same identification system, the same period of protection, the same scope of protection apply to both of them.

The cost of development

46. The frequently heard claim that plant breeders' rights offer no true compensation for the outlay on research and development involved in the production of varieties using genetic engineering or biotechnological methods, simply ignores the fact that breeding by the traditional methods can also be extremely expensive and that the introduction of new methods and their economic acceptance is only to be expected once they offer advantages in the amount of work or the amount of money required. The breeding of certain plant varieties using today's traditional methods has been costed at up to 15 million Swiss Francs. This latter figure is likely to represent a quite considerable amount even in the field of genetic engineering research.

The cost of traditional breeding is considerable. There is the same need to promote both traditional breeding and genetic engineering.

VI. THE ROLE OF GENETIC ENGINEERING IN PLANT BREEDING

Inseparability of genetic engineering and other developments in plant breeding

47. In lectures given at UPOV Symposia,[36] it has been made clear that genetic engineering cannot replace plant breeding, but in fact complements it and in most cases simply provides the plant breeding industry with new effective aids for obtaining breeding results. A case in which new genetic engineering developments could lead to a complete plant variety, without having to make use of traditional breeding or propagation processes, is indeed hardly conceivable. For that reason alone, it would be inappropriate and unrealistic to provide two different systems of protection, one for a genetic engineering sector of breeding and the other for the remainder of the breeding activities.

Genetic engineering in plant breeding is a continuation of traditional breeding methods.

Genetic engineering will not replace traditional breeding processes, but simply complement them. A split between two types of protection must therefore be avoided.

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[36] Max Rives, Introducing New Technology to Plant Breeding, Records of the UPOV Symposium on Genetic Engineering and Plant Breeding, October 1982, UPOV publication No. 340(E), UPOV 1983, pages 53 et seq.; Sir Ralph Riley, Developments in Biotechnology - Dream or Reality, Records of the UPOV Symposium on Industrial Patents and Plant Breeders' Rights - Their Proper Fields and Possibilities for their Demarcation, October 1984, UPOV publication No. 342(E), UPOV 1985, pages 41 et seq.

The use of genetic engineering methods for plant breeding is no obstacle to the grant of plant breeders' rights.

48. Whatever genetic engineering methods may be used for breeding plants in future, their application will never exclude the grant of plant breeders' rights for the finished variety. As already mentioned, the UPOV Convention protects all new varieties of plants that meet the requirements described in this document. It makes no difference whether they have been obtained by processes that are already known or by processes that may become available in future.

Varieties obtained with the aid of genetic engineering methods are protectable without restriction under the UPOV system.

Poor suitability of genetic engineering methods for solving the problems of reproducibility

49. One of the great advantages of the UPOV system is that it does not require proof of the reproducibility of the breeding process. Patent law is somewhat different.[37] As regards the affirmation that the patent law problem of proving the reproducibility of an invention would be solved with the aid of genetic engineering, it must first be pointed out that, so far, not a single variety has been produced by means of genetic engineering - whether by using artificially produced genes or by inserting natural genes into existing varieties. In view of the complex genome of the more highly developed plants, it is also not possible to forecast when this could possibly happen. Even if such processes should become possible in the future, this would still not solve the problem of reproducibility. Reproducibility could refer, at best, in such a case to the insertion of a gene or of individual genes into an existing variety. However, a variety cannot be described by the characteristic of a given gene or of given individual genes. The variety as a whole, which does not consist of just one gene but of an entire genome (comprising up to some 50 thousand genes) must satisfy the protection requirements in respect of all its important genetically based properties. The production of a variety in its entirety does not become reproducible simply because the insertion of a given gene would appear reproducible.

Under the UPOV system no proof of the reproducibility of the breeding process is required. This is still a problem for the patent law.

Genetic engineering will not be able to solve the problem of reproducibility for patent law.

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[37] See decision of the German Federal Court of March 27, 1969, in the Rote Taube (Red Dove) Case, GRUR 69, pp. 672 et seq, and the conclusions of Hesse, GRUR 69, pp. 644 to 653, reproduced in UPOV publication No. 342(E), p. 95; likewise the decision of the Swiss Federal Court of January 27, 1953.

VII. THE IMPLICATIONS OF THE PATENTING OF PLANT VARIETIES FOR SOCIAL POLICY

50. As regards the implications of protecting plant varieties with respect to social policy, a balance must be found between the value for society of promoting new technologies (extensively identical with the interests of the breeding industry) and the public interest in maintaining a reasonable limitation on monopoly rights in staple needs such as foodstuffs, that constitute the main area in which variety protection law is active. It is a fact that public interest is of particular importance in the agricultural sector, particularly where the aim is to ensure the supply of food. The specially adapted scope of protection afforded by the UPOV Convention and the freedom guaranteed by Article 5 (3) to use protected varieties as initial material for the creation of new varieties constitute excellent examples of the balanced compromise achieved by the UPOV Convention, particularly as between these two interests. This achievement should not be jeopardized by opening up the patent route.

The UPOV system has achieved a balanced compromise between differing general interests, which should not be called into question.

The general interest in a reasonable limitation of the protection for staple foodstuffs continues to be of particular importance.

VIII. ADAPTABILITY OF THE PROTECTION UNDER THE UPOV SYSTEM TO NEW DEVELOPMENTS

52. Representatives of the breeding industry have repeatedly emphasized at UPOV Symposia that the industry is very interested in the new genetic engineering developments and has therefore no reason to oppose the efforts to create appropriate protection for the investments devoted to those developments. In general, this can also be described as the UPOV position. UPOV in no way refuses adaptations that will become necessary in the future, but nevertheless considers that this should first be approached as a continuing development of the UPOV system within the framework of the existing possibilities. Where it is a matter of the scope of protection, for instance, improvements can be made within the framework of the UPOV Convention, which is extremely flexible in that respect, without the Convention having to be amended. A cautious advance along these lines, that is to say by extending the protection specifically adapted to living matter, would certainly be preferable to opening up the path, that had intentionally been closed by the lawmakers of numerous countries, towards a system of rights not adapted in that way. If the adaptations made within the system should prove no longer sufficient, the necessary changes would have to be made for <u>all</u> varieties

The need for suitable investment protection has not been ignored by UPOV.

Where adaptation is necessary, the possibilities of the flexible UPOV Convention should first be exhausted.

Any revisions will have to be made in respect of all varieties.

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and not only for those that happened to be suited to a given type of protection, e.g. not only for those varieties that were created with the aid of certain processes, whereas other equally valuable varieties, bred by other processes, would continue to be subject to the previous more restricted rule. Anything in the present system that needed revising would have to be corrected by improving the system as a whole and not by promoting a certain development under which any possible corrective action would depend on the ability shown in claiming protection.

IX. SUMMARY OF THE ADVANTAGES OF PROTECTING NEW PLANT VARIETIES UNDER THE UPOV CONVENTION

Summary of the main advantages of the UPOV Convention.

53. The UPOV Convention offers considerable advantages for the protection of new varieties of plants:

(i) It is carefully adapted to the particularities of its subject matter; discoveries may also be protected.

(ii) It contains clear and detailed rules on the content of protection to which the member States are committed. It ensures that acceding States comply with these rules in their domestic law.

(iii) It has led in the member States to harmonization in the establishment and implementation of plant breeders' rights; UPOV Committees facilitate an even more extensive harmonization in law and practice.

(iv) It contains clear provisions on a number of matters which are governed in patent law by case law only or by office practice (with a risk of diverging decisions, particularly from one State to another).

(v) It leaves sufficient flexibility, on the other hand, where this could be necessary, for national laws that are more advantageous to the breeder (e.g. in the scope and period of protection) and is thus prepared for adaptation to future developments.

(vi) It ensures that plant breeders' rights will only be granted under the conditions set out in the Convention and that the invalidation of such rights can only be effected on the grounds explicitly stated in the Convention.

(vii) It has not adopted the requirements of general patent law for the grant of rights since these have been primarily developed for non-living matter and are not altogether satisfactory for living matter; thus systematic legal problems are avoided.

(viii) It is based on the concept of growing tests of propagating material of the variety, that is to say of living matter, and on a description that stems from that examination and is therefore reliable.

(ix) It is based on a careful balance between the important interests of the community and at the same time takes into consideration the concerns of the breeding industry, of agriculture as a whole and of the users. This applies most particularly to the provisions on the scope of protection.

(x) It guarantees the entitlement to free use of protected varieties for the breeding of further varieties; a logical element, since breeding is always based on existing material.

(xi) It contains minimum guarantees for the breeders, particularly as regards the scope and period of protection.

(xii) The scope of protection under the Convention clearly comprises any production of propagating material for the purposes of marketing and any marketing of such material. There is thus no exhaustion of rights.

(xiii) It achieves clear identification of varieties; in principle, only one variety denomination exists for one and the same variety in all member States of UPOV, and this must be used in any marketing of the propagating material.

(xiv) It provides that all varieties, however bred, are protected under the same system; this ensures the necessary legal certainty for the users of the varieties and for the concerned economic circles.

(xv) It is applicable without restriction to varieties bred with the aid of genetic engineering processes.

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