

International Union for the Protection of New Varieties of Plants

UPOV



**SEMINAR ON STRATEGIES THAT ADDRESS
POLICIES INVOLVING PLANT BREEDING
AND PLANT VARIETY PROTECTION**

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(GENEVA, SWITZERLAND)

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*The views expressed in the papers and discussion summaries of the Seminar are those of the speakers and/or participants and are not necessarily those of the International Union for the Protection of New Varieties of Plants (UPOV).

PROGRAM OF THE SEMINAR

The purpose of the seminar was to exchange information and experiences of members of the Union on strategies involving plant breeding and plant variety protection that address broad policy issues.

- 12.00** **Program and organization of the Seminar**
Moderator of the Seminar: Mr. Peter Button, *Vice Secretary-General, UPOV*
- 12.10** **Welcome and opening remarks**
Mr. Daren Tang, *Secretary-General, UPOV*
- 12.15** **CANADA**
The role of plant variety protection in supporting public breeding institutions, and partnerships with producers and industry
Mr. Anthony Parker, *Commissioner, Plant Breeders' Rights Office, Canadian Food Inspection Agency (CFIA)*
- 12.25** **CHINA**
Seed Policies Promoting China's Plant Breeding Innovation
Mr. Yehan Cui, *Principal Consultant, Development Center of Science and Technology (DCST), Ministry of Agriculture and Rural Affairs (MARA)*
- 12.35** **EUROPEAN UNION**
EU strategies involving plant breeding and plant variety protection – European Green Deal (Farm to Fork Strategy)
Ms. Päivi Mannerkorpi, *Team Leader - Plant Reproductive Material, Unit G1, Plant Health, Directorate General for Health and Food Safety (DG SANTE), European Commission*
- 12.45** **Break**
- 13.00** **JAPAN**
Japan's Intellectual Property Strategy in the field of PVP
Mr. Teruhisa Miyamoto, *Deputy Director of Plant Variety Office, Intellectual Property Division, Export and International Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries (MAFF)*

- 13.10 KENYA**
The role of plant variety protection in promoting food security, employment creation and improving farmers' livelihoods
Mr. Simon Mucheru Maina, *Head, Seed Certification and Plant Variety Protection, Kenya Plant Health Inspectorate Service (KEPHIS)*
- 13.20 MEXICO**
Public policies to promote innovations in plant varieties
Mr. Leobigildo Córdova Téllez, *Head, National Service for Seed Inspection and Certification (SNICS), Secretariat of Agriculture and Rural Development (AGRICULTURA)*
- 13.30 NORWAY**
The importance of plant breeding for food security. Recent policy development in Norway
Ms. Svanhild-Isabelle Batta Torheim, *Senior Advisor, Department of Forest and Natural Resource Policy, Ministry of Agriculture and Food*
- 13.40 Break**
- 14.00 PERU**
Strategies for promoting Peru's Plant Breeding Protection
Mr. Manuel Castro Calderón, *Director, Directorate of Patents and New Technologies, National Institute for Defense of Competition and Protection of Intellectual Property (INDECOPI)*
- 14.10 SWEDEN**
The need to sustain "small" breeders
Mr. Magnus Franzén, *Deputy Head, Plant and Control Department, Swedish Board of Agriculture*
- 14.20 UNITED STATES OF AMERICA**
Initiatives from the 2018 Farm Bill Supporting Farm Production, Conservation, and Plant Variety Protection in the United States
Mr. Jeffery Haynes, *Commissioner, Plant Variety Protection Office, United States Department of Agriculture (USDA)*
- 14.30 Questions**
- 14.50–15.00 Concluding remarks and Closing**
Mr. Marien Valstar, *President of the Council, UPOV*

WELCOME AND OPENING REMARKS

MR. DAREN TANG, Secretary-General, UPOV

Mr. Marien Valstar, President of the UPOV Council,

Dear Participants, Dear Colleagues, Dear Friends,

It is a pleasure to be with you today and to open this seminar.

This year marks the 60th anniversary of UPOV's foundation. Back in 1961, UPOV was created to recognize the importance of the protection of new plant varieties and to uphold the interests of plant breeders around the world.

Six decades on, I would like to highlight three policy pillars which capture the impact of UPOV's work:

- First, transforming food production in a time of climate change.
- Second, spurring economic development through plant breeding and UPOV's system of plant protection.
- And, third, bringing innovation and technology transfer to farmers.

It is important to remember that at the time UPOV was formed the only way to produce more food was to use more land. However, this link has now been superseded thanks to innovation. Since the 1960s, food production has increased nearly four-fold, while land use has expanded by only around 10 percent. This means we can feed more by using less.

It has been estimated that plant breeding and new plant varieties are currently responsible for around 90 per cent of cereal land productivity gains in Europe. And if plant breeding has delivered in the past, then it will be even more important to ensuring food security in the future. This is well understood by the agricultural sector. A recent survey from the World Farmers Organization found that over 70 per cent of farmers are utilizing improved plant varieties. Moreover, eight in ten farmers who use new plant varieties identified them as important factors in ensuring the sustainability of food systems and in combatting climate change.

This aligns with UPOV's broader desire to accelerate progress towards the UN's Sustainable Development Goals. UPOV has identified six SDGs, which plant breeding and the UPOV system directly contributes towards. From ending hunger, achieving food security and improved nutrition to protecting terrestrial ecosystems and halting biodiversity loss – transforming food production is helping to deliver a fairer, greener and more sustainable world.

This brings me to the second pillar: economic development.

In my address to the UPOV Council following my appointment as Secretary-General last year, I referenced the impressive economic benefits of plant breeding and UPOV's system of plant variety protection. Today, I want to discuss another important aspect of UPOV's work – the support we provide to people and communities around the world.

I have three examples that I would like to share.

First, in Kenya, UPOV membership has ensured access to much sought-after varieties of cut-flower roses. Thanks to their growing popularity, Kenya has developed a \$500 million cut-flower industry which, in turn, brings secure employment to around half a million Kenyans.

Second, in Viet Nam, thanks to plant breeding activities, the annual income of farmers has increased by over 24% since it joined UPOV in 2006. It is estimated that plant breeding has resulted in significant annual productivity increases for Viet Nam's main staple crops such as rice and maize, with the increased productivity associated with plant breeding being equivalent to more than 2.5 per cent of Viet Nam's GDP.

And finally, this year marks the tenth anniversary of Peru's membership of UPOV. In that time, more than 80 new varieties of grapes and more than 60 new varieties of blueberries have been protected.

This has helped to turbo-charge Peru's exports. For example, trade in fresh grapes is up almost ten-fold over the last decade, with blueberry exports up by a multiple of thirteen in the last five years alone.

This is how UPOV helps to lift up people and communities around the world – supporting job creation, business investment and economic growth. And in the context of a pandemic that continues to take a terrible toll – including on many livelihoods around the world – this work is as important today as ever.

The third pillar concerns innovation and technology transfer to farmers.

Through an effective Plant Variety Protection (PVP) system, UPOV stimulates the development of new plant varieties. And these new varieties represent one of the most effective ways of delivering new technology to farmers. It is a symbiotic relationship: UPOV enables plant breeders to protect their varieties and to obtain a return on their investment; with this income predicated on farmers choosing to grow more suitable varieties that match local and export needs.

Equally, the UPOV system continues to support the delivery of public goods. Take the UC Davis Public Strawberry Breeding Program. Over six decades, the program has developed more than 30 protected varieties, made strawberries a year-round crop in California, and boosted strawberry yield from just 6 tons per acre in the 1950s to 30 tons per acre today.

Thanks to the UC Davis program, Californian growers pay lower rates than others for their strawberries and get access to new varieties before growers elsewhere.

Not only do UC Davis varieties benefit domestic growers but they have been instrumental in the development of the strawberry industry in several UPOV members – for instance 70–90% of strawberries in Spain have been bred by UC Davis, which transferred the varieties and knowledge as a part of the PBR license process.

Dear Participants, Dear Colleagues, Dear Friends,

As you can see, the legal framework of protection offered by the UPOV system is as important today as it was 60 years ago. But while protection remains the cornerstone of UPOV's work, its broader impact continues to be felt around the world.

- From progressing sustainable solutions at a time when humanity faces a code red from climate change.
- To providing jobs and economic growth in developing and the least developed countries.
- To supporting agricultural innovation and technology transfer.
- Plant breeding and plant variety protection is making a real difference to people and communities on the ground.

Today, you will hear from speakers representing countries right around the world. While their experiences differ, in all cases UPOV's work has an important role to play in realizing their future ambitions. On behalf of UPOV, I would like to thank all our speakers for their time today and I would like to thank everyone in the audience for your participation.

Please accept my best wishes for a lively, engaging and thought-provoking seminar.
Thank you.

CANADA

THE ROLE OF PLANT VARIETY PROTECTION IN SUPPORTING PUBLIC BREEDING INSTITUTIONS – PARTNERSHIPS WITH PRODUCERS AND INDUSTRY

MR. ANTHONY PARKER, Commissioner,
Plant Breeders' Rights Office,
Canadian Food Inspection Agency (CFIA)

INTRODUCTION

Investment in plant breeding results in clear and substantial public (societal) benefits. The proliferation of new kinds of crop and improvements in yield, quality, disease/pathogen resistance, and stress tolerance have raised agriculture productivity, contributing to food security and economic prosperity. Continuous improvements in new varieties have staved off the threat of food scarcity due to a growing population and limitations on the availability of arable land. These improvements are also helping us to cope with the challenges of climate change and consumer/societal expectations that food, fibre, and fuel is grown in sustainable ways, mitigating negative impacts on the environment. Historically, many nations, including Canada, recognized the need to make substantial public investments in plant breeding to serve the public interest (e.g. national food security, economic viability of farming, trade opportunities, and rural economic development). Often these investments were made well before the advent of appropriate forms of intellectual property protection such as Plant Breeders' Rights (PBR) were available that could incentivize long-term funding in plant breeding by the private sector. As such, it was the role of the State to intervene where there was "market failure" and provide the funding needed to support plant breeding, particularly where the private sector could not. To illustrate the point, in Canada on June 2, 1886, Parliament implemented an *Act Respecting Experimental Farm Stations*, which began the growth and proliferation of research stations across the country. Public plant breeding became an important element of these research stations, bringing new and improved varieties to Canadian farmers. However, there is an often-used adage in bureaucracies that governments never run out of priorities but simply the budget needed to fund all the priorities. In the 1990s, Canada experienced a consolidation of publically funded breeding programs. Some programs were cut, others phased out, and many lived on but with reduced funding. Occasionally, some were transitioned to joint ventures where producers and industry were involved to help financially support the programs. This coincided with the rise of an increased role for the private sector in plant breeding, and also precipitated the need to implement a *Plant Breeders' Rights Act* in Canada.

CASE STUDIES

There is still a strong case to be made for public sector investment in plant breeding. However, the underlying rationale, approach, and potential outcomes may be different today compared to a hundred years ago. This less because the State is needed to intervene and address a clear market failure, but rather to provide the "seed" money, capital, and resources needed to establish breeding programs in specific areas to further the public interest. This could be the development of new kinds of crop, which increases genetic and varietal diversity, and creates

new markets and opportunities for farmers. But it can also be to address gaps where private sector capacity does not exist. However, from the moment the public sector decides to make such investments, it should immediately turn its attention to long-term sustainable mechanisms and self-funding of such programs. This would eventually lead to the creation of not-for profit, for profit, producer owned, and/or self-financed public breeding programs that can effectively compete in a competitive marketplace. PBR plays a critical role in this approach, ensuring that the public sector no longer occupies a dominant and exclusionary monopolistic position in the marketplace. Rather, a more appropriate role for government and public funds today is as a “first innovator” and “pace setter”, providing incentives to stimulate competition, further imitation, the transfer of knowledge and technology to others, and in some cases “spin off” the activities for others to continue the good work. I would like to share with you three such examples of these types of approaches, employed in different kinds of crop:

Haskap (*Lonicera caerulea*)

The University of Saskatchewan – Crop Development Centre Haskap breeding program started collecting *Lonicera caerulea* varieties in 1997 and began breeding efforts in 2002. It now has the world’s most diverse germplasm collection and largest breeding program for this crop type. The initial strategy was to combine desirable attributes of germplasm from the Russian Federation, Japan, and the Kuril islands. Each subspecies of haskap has unique and valuable attributes that were identified and selected for in the breeding program, including: large berries, upright bushes, good flavour, high sugar content, disease resistant, early uniform ripening, high yields, adaptation to Canadian soils, weather, and climate. Successful varieties have flavours similar to raspberry and blueberry, and variations thereof. They have an upright plant habit, and are high yielding, suitable for machine harvesting. Berries must be durable and have uniform ripening. The program is seeking to develop early, mid and late-ripening varieties to extend the season of availability in the marketplace. Significant research is now being conducted on identifying varieties with high levels of antioxidants and other healthy chemicals (super foods). The current end-use market for the berries is in processed foods: pastries, jams, juice, wine, ice cream, yogurt, sauces, and candies. However, interest is now increasing in the fresh fruit market (similar to raspberries, blueberries, and blackberries). In addition, many varieties are now being offered for sale in the garden/nursery sector as ornamental edible shrubs. Over the past 15 years, the breeding program has been receiving PBR-enabled royalties, increasing incrementally each year. 65% of the revenue flows back to directly support the program. 35% is allocated towards machinery and equipment that supports all horticulture programs at the university. PBR-enabled royalties now self-finance the breeding program entirely, allowing the full time employment of technicians and graduate students. It also funds a part-time employee to maintain equipment and machinery. The royalties are now three times the amount received

in provincial grants (Agriculture Development Fund of Saskatchewan Agriculture) as the “seed money” to start up and support the breeding program. Varieties are now being licensed and sold in Europe. “Aurora” appears to be the most popular variety globally, notable for its sweet flavour and durable transportation qualities. To date, seven University of Saskatchewan haskap varieties have applied for Canadian PBR protection. The sudden growth and interest in domestic haskap production has stimulated imitation and competition in the marketplace. The Canadian PBR office has received an additional 12 haskap applications from foreign breeders (United States of America and the Netherlands).

Asparagus (*Asparagus officinalis*)

The University of Guelph asparagus breeding program was established in the late 1980s. The goal of the breeding program was to create all-male hybrid varieties adapted to northern regions and cold winters. Breeding objectives included yield, quality, longevity, and disease resistance. As a perennial crop, breeding asparagus varieties is a time-consuming and long-term endeavour. Asparagus takes approximately three years to establish before yields can be measured. Years 4 to 6 involve continuous study before the best lines can be evaluated at preliminary trials across multiple locations. This stage of the evaluation process can take another six years. At a minimum, it takes 12 years to breed a new variety. The first variety released from the breeding program was “Guelph Millennium” in 2000 (CAD PBR Cert #1427), which transformed the Canadian asparagus industry. “Guelph Millennium” featured many highly sought-after characteristics by growers, including high yield, longevity, and quality. All-male-only hybrids are renowned for yields which are three to four times higher than open-pollinated varieties, which were once the industry standard. In the province of Ontario, Canada, “Guelph Millennium” comprises 95% of the asparagus crop grown, and is attributed as saving the asparagus industry. The variety is also popular in the northern United States (Michigan and Washington), as well as in many European countries.

To handle the seed production and sales of “Guelph Millennium”, in 2012 the the Ontario Asparagus Growers’ Marketing Board created Fox Seeds. Fox Seeds is a “for profit” seed company that has entered into an exclusive licensing agreement to produce and sell “Guelph Millennium” domestically and internationally, and then return royalty revenue back to the University of Guelph to support the breeding program. This reinvestment back into the breeding program has yielded further results. More recently, the breeding program released two new varieties, “Guelph Eclipse” and “Guelph Equinox”, which have 20% higher yields and tighter spear tips than “Guelph Millennium”. It is expected that these new releases will begin to replace the “Guelph Millennium” plantings in the asparagus industry. Recently, a licensing agreement was reached with Global Plant Genetics to sell “Guelph Equinox” seed to the European market. Royalty revenues from

both domestic and international sales will continue to support the breeding program. In 2021 it was announced that Fox Seeds had hired a new plant breeder, and over a two-year period the University of Guelph asparagus breeding program will be transferred to that company. In the end the Asparagus Growers of Ontario will not only own the “for profit” seed company they started, but also the breeding program that has been serving them so well for the past 30 years.

Sweet cherry (*Prunus avium*)

In 1914, the federal government established the Dominion Experimental Farm, at Summerland, British Columbia. The research station, now known as the Pacific Agriculture Research Centre (PARC), began sweet cherry breeding in 1936. The breeding program released many new and successful cherry varieties but, without any form of plant variety protection in Canada, these varieties were often used by growers without fair compensation. Additionally, growers from other countries would take these varieties and then compete against the Canadian market. Until the beginning of the 1990s the sweet cherries remained a fledgling crop in British Columbia with annual sales of only \$500,000 (CAD). The introduction of a *Plant Breeders' Rights Act* in Canada dramatically changed the landscape and provided the opportunity for British Columbia growers to take control of their future. Shortly after the *PBR Act* came into force, the British Columbia Fruit Growers Association approached the federal government to strike a partnership agreement. Summerland Varieties Corp. was founded and owned by the British Columbia Fruit Growers Association, and was given the mandate to license all new sweet cherry and apple varieties released from the PARC breeding program. Furthermore, Summerland Varieties Corp. quickly expanded its mandate to assist other breeding programs both domestically and internationally, acting as agent and licensee in the Canadian marketplace, and bringing a diversity of new varieties to growers. The release of the cherry variety Staccato™ (PBR Cert #1346) dramatically changed the cherry industry. Staccato cherries have a deep red skin and sweet taste, and are late maturing, not ripe for picking until August. This differentiates it from other popular varieties, providing the opportunity to supply later-season cherries to consumers. The net effect is that it has completely transformed the Canadian cherry sector, turning it into a multi-million-dollar industry. Summerland Varieties Corp. licenses federal government bred cherry varieties in a way that ensures Canadian growers maintain their competitive advantage. The newest varieties are released to Canadian growers first. Over time, the varieties are then licensed for production in other jurisdictions internationally. Summerland Varieties Corp. collects PBR-enabled royalties, and funnels them back to PARC to support the breeding program, as well as other research activities. In the end, we see a grower-owned licensing company cooperating with the federal government to create a mechanism for sustainable funding of the breeding program. It does this in a way that ensures that the domestic cherry industry maintains a competitive advantage globally.

CONCLUSION

It used to be critical for the public sector to make sizable investments in plant breeding. The science and technology was new and evolving. Harmonized frameworks for intellectual property protection and, more specifically, UPOV-based PBR laws are only a relatively recent development. Although the first convention was created in 1961, widespread growth and adoption of UPOV-based PBR laws did not start until the early 1990s. It is only fitting and wise that State investment spurred on research and development, including plant breeding, in the horticulture and agriculture sectors. The return on investment and impact on development has been sizable and impressive. Indeed, enormous advancements have been made in plant breeding over the past 100 years, and much of it attributed directly to public sector funding. However, plant breeding can no longer be thought of as simply a “pure research” activity. It is a “near market” activity, and plant varieties are released into the marketplace for commercial purposes (but not in all cases). Consequently, the public sector needs to change its approach to funding plant breeding. The State can play an important role in providing the “seed” money to develop new crops, intervene in under-funded crops, and play a role where the private sector cannot. However, from the moment these investments are made, it is critical that the public sector turns its attention to long-term sustainable mechanisms and self-funding of such programs. In this area, PBR protection can play a critical role. PBR-enabled royalties can aid in supporting not-for profit, for profit, producer owned, and/or self-financed public breeding programs. PBR can also level the playing field, promoting both free and fair competition. It can also help ensure that exclusionary public sector monopolies are not formed. Public sector investments in plant breeding are very good investments. However, the public sector should see itself as a “first innovator” and “pace setter”, not as the only dominant player in the market. It should provide incentives to stimulate competition and further imitation and the transfer of knowledge and technology so that others may participate in the marketplace. In the end, this is the best use of public funds, promoting free and fair competition, and ultimately placing the farmer/producer at the centre of the agriculture ecosystem. This gives them a diverse set of options and choices so that they can be sustainable and prosperous.

PRESENTATION MADE AT THE SEMINAR



The role of plant variety protection in supporting public breeding institutions: Partnerships with producers and industry

UPOV Seminar – 2021/10/20

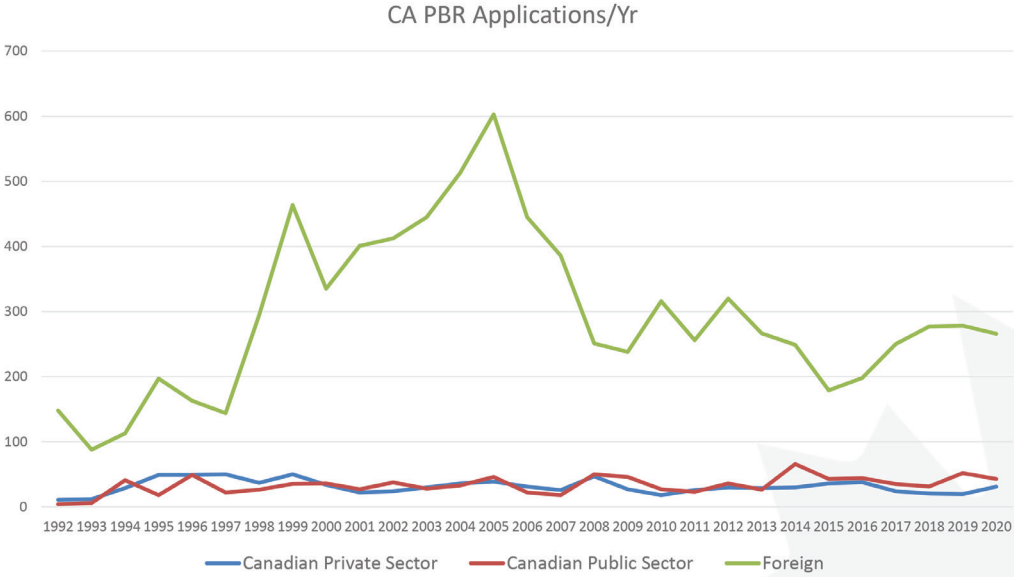


Canada

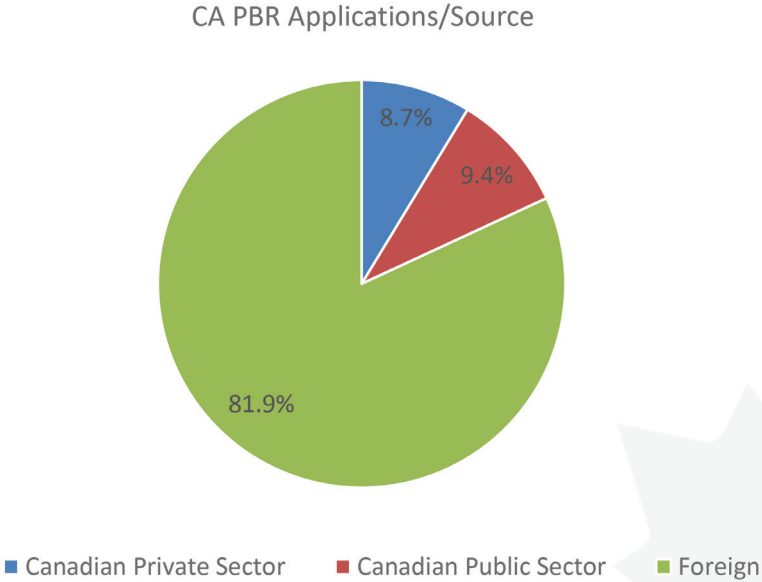
Overview

- Canada has a strong tradition of supporting public breeding programs:
 - Federal – Agriculture Agri-Food Canada
 - Universities – University of Saskatchewan, University of Guelph, University of Alberta, McGill University, etc.
- Adoption of UPOV'78 in 1991, and strengthening our *Plant Breeders' Rights* (PBR) law with ratification of UPOV'91 in 2015, created opportunities for public/producer partnerships.
- Case Studies:
 - Haskap (Blue Honeysuckle) – University of Saskatchewan
 - Asparagus – University of Guelph
 - Sweet Cherry - Agriculture Agri-Food Canada

CA PBR Applications



CA PBR Applications



Case Study - Haskap

- Native to Northern Boreal forest regions (Asia, Europe, and North America).
- Haskap can be used in processed products: pastries, jams, juice, wine, ice cream, yogurt, sauces, and candies



Case Study - Haskap

- University of Saskatchewan started breeding efforts in 1990's – assessing material originating from Japan and Russia
- Funded initially through University investments and provincial government grants, but now supported by PBR based royalties (self-funded).
- 65% of revenue directed to the haskap breeding program (graduate students, technicians, labourers), and 35% directed to capital investments common to all horticulture programs (equipment and services).
- Supports domestic growers, while obtaining revenue from off shore licensing (Europe)
- 'Aurora' (2018 - CA PBR # 5750) is the #1 variety globally
- Program is healthy and self-sustaining, releasing improved new varieties every few years.

Case Study - Asparagus

- 1980's: University of Guelph, Ontario Ministry of Agriculture, and producers began investing in the breeding program
- After twenty years, 'Guelph Millennium' (2003 – CA PBR # 1427) was released and transformed the domestic industry. Cool season, late maturity, winter hardy variety
- 95% of Ontario's asparagus production is 'Guelph Millennium', popular in Northern US and UK.
- Newer releases ('Guelph Eclipse' and 'Guelph Equinox') improved yield by 20% with tighter spear tips
- 2016 - UK-based Global Plant Genetics, exclusive licensing agreement to distribute seeds in Europe

Case Study - Asparagus



- **Fox Seeds** - a "for profit" seed business, created and owned by the Asparagus Farmer's of Ontario, has exclusive license to produce and sell hybrid asparagus seeds
- University of Guelph asparagus breeding program is now being transitioned to Fox Seeds over a 2 year period (2021-2023)

Case Study – Sweet Cherry

- Summerland Varieties Corp. (formerly Okanagan Plant Improvement Company), created (1993) and owned by the British Columbia Fruit Growers Association
- Original mandate - to license new cherry varieties bred by the federal government breeding program; Agriculture and Agri-Food Canada (AAFC) in Summerland
- 80% of the global sweet cherry varieties originate from AAFC Summerland
- SVC expanded mandate to handle licensing and royalty collection for public and private bred tree fruit varieties, from domestic and foreign sources

Case Study – Sweet Cherry

- Staccato ® cherry '13S2009' (2003 – CA PBR # 1346) transformed the Canadian cherry sector, increased domestic production five-fold in 15 years
- SVC licenses AAFC cherry varieties globally, in a way that maintains advantage for Canadian growers (first release)
- SVC collected royalties supports the AAFC breeding program with sustainable long term funding



Observations

- Taxpayer and producer investment in plant breeding yields public interest benefits; improved and adapted varieties, creation of new market opportunities, value chain growth through technology transfer (licensing), imitation, competition, etc.
- However, difficult to sustain long-term funding of public institutions and risks the creation of an exclusionary public monopoly
- PBR protection helps protect taxpayer and producer investments.
- Licensing and royalties provides the means for producer ownership or self-financing of public programs
- PBR creates a level playing field where private, public, and/or private/public partnerships can operate in the marketplace

Thank You!

anthony.parker@inspection.gc.ca

CHINA

SEED POLICIES PROMOTING CHINA'S PLANT BREEDING INNOVATION

MR. YEHAN CUI, Principal Consultant,
Development Center of Science and Technology (DCST),
Ministry of Agriculture and Rural Affairs (MARA)

As a super-populous country of more than 1.4 billion people, the Chinese government has always regarded national food security as its top priority. Agriculture is the foundation of a nation, to which seed matters the most. The seed industry, as a national strategic and basic core industry, is essential for promoting long-term agricultural development, safeguarding food security, and maintaining social stability. The Chinese government attaches great importance to the development of the crop seed industry. Since 2011, a series of policies have been successively issued, such as *Opinions on Accelerating the Development of Modern Crop Seed Industry*. This thus opens up a prelude to reform of the seed industry and ushers in unprecedented development opportunities for the seed industry in China.

I POLICIES AND REGULATIONS CONCERNING THE SEED INDUSTRY

In 1997, the *Regulations of the People's Republic of China on the Protection of New Varieties of Plants* was promulgated, establishing the core intellectual property protection legislation in the seed industry. In 1999, China began to accept applications for plant variety rights from home and abroad following its entry into the International Union for the Protection of New Varieties of Plants (UPOV).

In 2000, the *Seed Law of the People's Republic of China* was enacted, initiating the marketization process of China's seed industry. In 2015, the Seed Law was amended to strengthen the protection of new varieties of plants. The revision adds a chapter dedicated to plant variety protection, which heightens its legal status; includes distinctness, uniformity and stability (DUS) tests as the basic technical requirement for variety management; and increases penalties for infringement of plant variety rights by significantly raising the amount of compensation.

In 2011, the *Opinions on Accelerating the Development of Modern Crop Seed Industry* (SC No.8) clearly proposed to establish a modern crop seed industry that integrates breeding, reproduction and promotion, with a view to an industry-led, enterprise-dominated and base-backed system that combines with seed companies, universities and research institutes.

In 2013, the *Opinions on Deepening the Institutional Reform and Improving the Innovation Capability of Seed Industry* (SC No.109) put down measures for strengthening the dominant position of enterprises in technological innovation; stimulating the enthusiasm of research personnel; enhancing national major scientific research on improved varieties; improving the capability of basic public welfare services; speeding up the capacity building of seed production bases; and tightening seed market supervision.

In 2015, the *Law of the People's Republic of China on Promoting the Transformation of Scientific and Technological Achievements* was revised. In 2016, the State Council issued the *Circular on the Implementation of Certain Provisions of the Law of the People's Republic of China on Promoting the Transformation of Scientific and Technological Achievements* (SC No.16). To reward those who have completed or greatly contributed to the transformation of job-related scientific and technological achievements, a proportion of no less than 50% of the net income obtained from technology transfer or licensing shall be used.

In 2019, the *Opinions on Strengthening the Protection of Intellectual Property Rights* required the protection of new plant varieties to be strengthened, and an acceleration of the procedures for examination, approval, and safeguarding legal rights with respect to plant varieties.

II POLICIES PROMOTING PLANT BREEDING INNOVATION AND DEVELOPMENT

I. Main practices

1. Regulations. China has established integrated regulations of plant variety management that include PVP, variety registration for major and non-major crops. In terms of PVP, the list of protected plant genera and species has continuously expanded. The Ministry of Agriculture and Rural Affairs (MARA) has issued 191 listed plant genera and species. Furthermore, PVP-related fees have been suspended since 2017 to encourage breeding innovation. Registration for major crops is limited to five species: rice, corn, wheat, cotton and soybeans. Regarding the registration of non-major crop varieties, the first catalog includes 29 species, most of which are cash crops.

2. Mechanism. On the one hand, MARA launched, in conjunction with other departments, a pilot project in 2014 for the development of seed industry talents and the entitlement reform relating to scientific research achievements. Those who have made such achievements should obtain no less than 50% of the net income obtained from technology transfer or licensing thereof, which greatly stimulates and sustains the innovation of scientific researchers. At the same time, China has scaled up investment in basic public welfare research on the crop seed industry. On the other hand, China has established a modern seed industry development fund to encourage enterprise mergers and reorganizations and to explore innovative and diversified models of cooperation between research institutions and enterprises. Joint research on improved varieties of related crops has been initiated while accelerating the construction of a commercial breeding system for enterprises. A technology innovation system of the modern seed industry has initially taken shape, driven by two integrated wheels with division as well as cooperation: basic public welfare research led by scientific research institutions and technological innovation led by enterprises.

3. Management. In 2011, the Department for Seed Industry was set up under MARA. Administrative agencies for the seed industry have also been established at local levels to strengthen seed industry management. At the same time, China has continued to revise and improve administrative measures by raising the thresholds for plant variety registration. In addition, joint law enforcement by multiple departments and the joint action of administrative and judicial departments have been conducted to strengthen seed market supervision in order to safeguard plant variety rights.

4. Technology. The basic theoretical research on breeding has been strengthened to better protect and utilize crop germplasm resources and continuously explore innovative breeding methods. The general goal of breeding has shifted from simply pursuing yield to putting an equal emphasis on yield and quality. Breeding for better resistance should be carried out in a green and efficient manner, and varieties suitable for less cultivation and adapted to mechanization should be selected. Attention should also be paid to the development and application of molecular identification tools such as SSR, SNP and MNP.

II. Main results

1. Plant breeding. At present, self-selected varieties cover more than 95% of the planting area, of which improved varieties account for more than 96%. The corn variety Zhengdan 958 has been planted in most areas in China for more than ten consecutive years, and over 100 million RMB in royalty income from the variety has been received. The single-season yield of super rice approaches 1,200 kg/mu (18 tons/ha), and the double-season yield of third-generation hybrid rice "Sanyou No.1" exceeds 1,500 kg/mu (22.5 tons/ha), with the traits of higher yield and disease, cold and lodging resistance. Chinese breeders have, for the first time in the world, cultivated new varieties of rapeseed with more colored flowers and new varieties of morels suitable for cultivation. In addition, a new diploid hybrid potato variety has been cultivated for the first time, using whole-genome design breeding and gene editing technology.

2. Plant variety protection. Over the past two decades, annual PVP applications have increased with the enhanced awareness of plant variety right protection. Especially since 2017, China has been ranked first in the world for four years in a row in this regard. Meanwhile, enterprises have gradually established their position as the mainstay of innovation. Their PVP applications have surpassed those of research institutions from 2011 onwards, rendering an average annual growth rate of more than 20%.

3. Enterprise development. At present, there are nearly 100 domestic seed companies engaged in breeding, reproduction and promotion. Syngenta and Longping Hi-Tech have entered the world's top ten seed companies, while specialized breeding companies have sprung up such

as Ningbo Weimeng Seed Co., Ltd, Yangs Kiwi Fruit Co., Ltd, and Sanming Sencai Ecological Agriculture Co., Ltd.

III. Outlook

At present, China is revising the *Seed Law* and the *Regulations on the Protection of New Varieties of Plants*. Aimed at further improving the protection of plant variety rights, the revision considers expanding the scope of plant breeders' rights, establishing an essentially derived varieties (EDV) system, and increasing penalties so as to meet the requirements of the 1991 Act of the UPOV Convention. The entry into force of the newly revised laws and regulations will further strengthen plant variety right protection and encourage breeding innovation, enabling a better future for China's seed industry.

PRESENTATION MADE AT THE SEMINAR



Policies for Seed Industry Promoting Innovation and Development of Plant Breeding in China

Cui Yehan

Ph. D, Professor, Principal Consultant
Development Center of Science and Technology
Ministry of Agriculture and Rural Affairs, P. R. China





I. Policies and Regulations Concerning the Seed Industry



II. Policies Promote Plant Breeding Innovation and Development



III. Outlook



I. Policies and Regulations Concerning the Seed Industry

1997



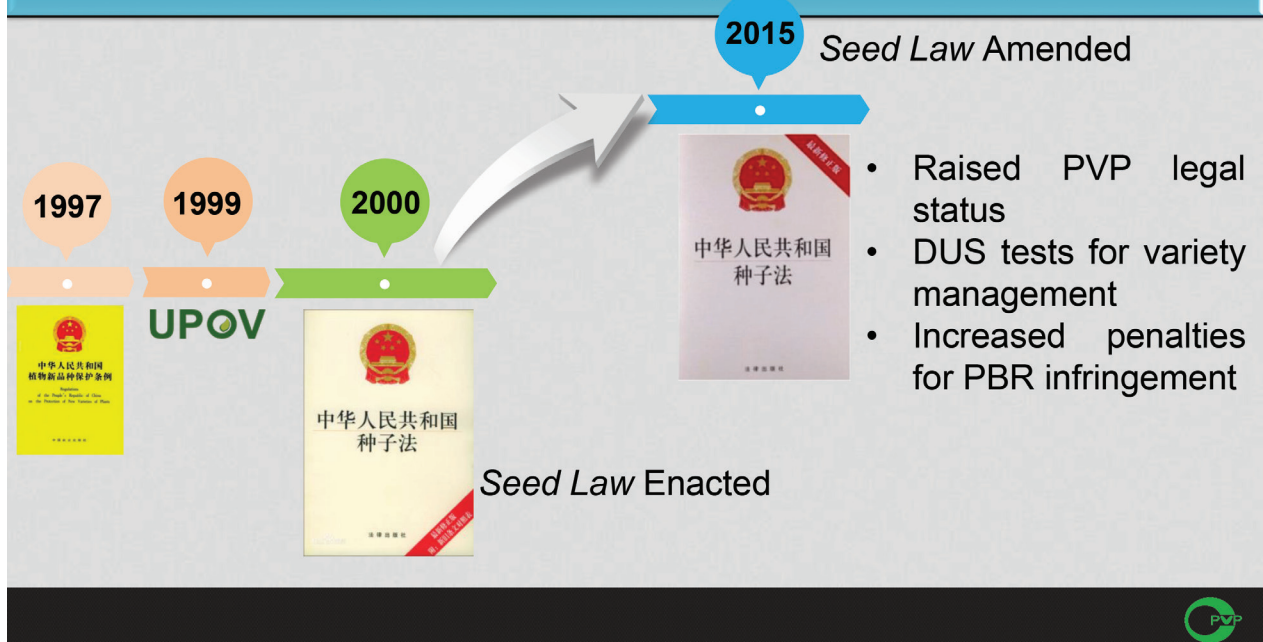
PVP Regulations promulgated



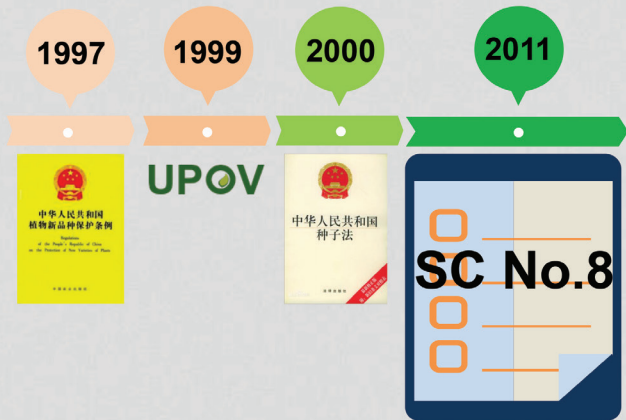
I. Policies and Regulations Concerning the Seed Industry



I. Policies and Regulations Concerning the Seed Industry



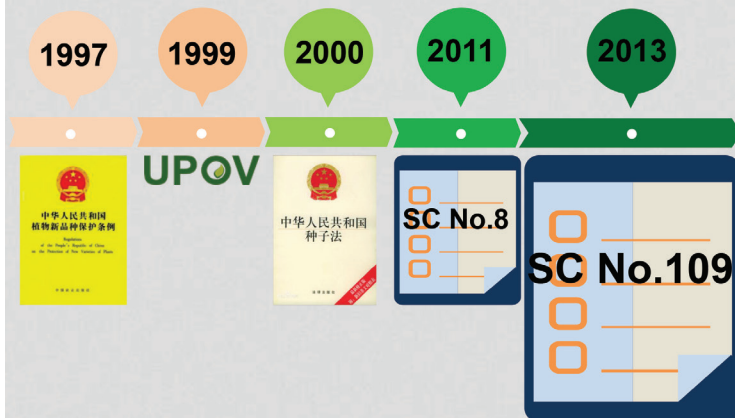
I. Policies and Regulations Concerning the Seed Industry



- *Opinions on Accelerating the Development of Modern Crop Seed Industry* (SC No.8)
- Proposed to establish a modern crop seed industry
- Combined with seed companies, universities and research institutes.



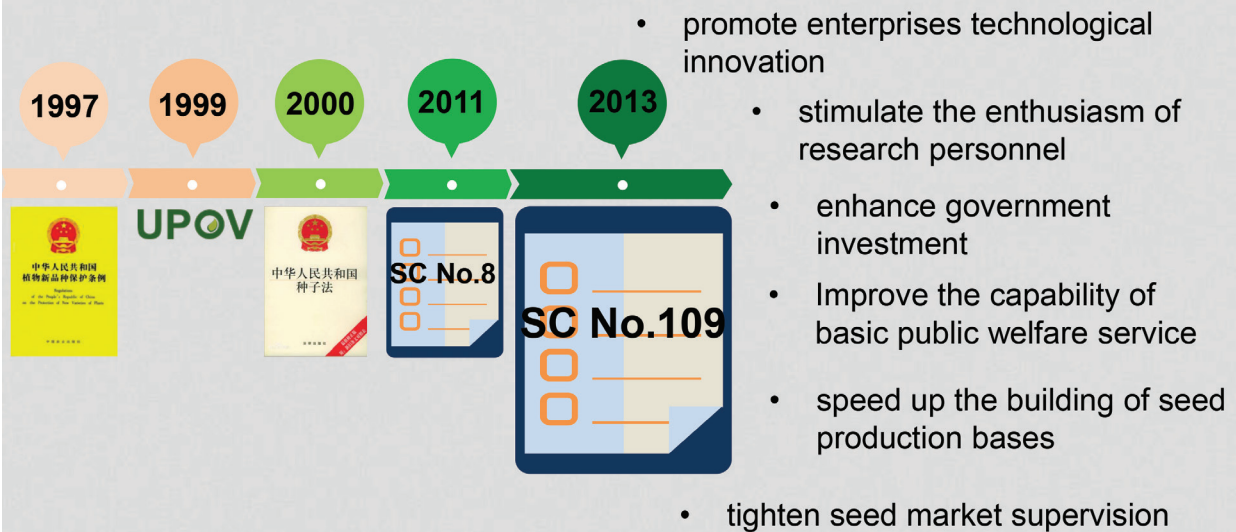
I. Policies and Regulations Concerning the Seed Industry



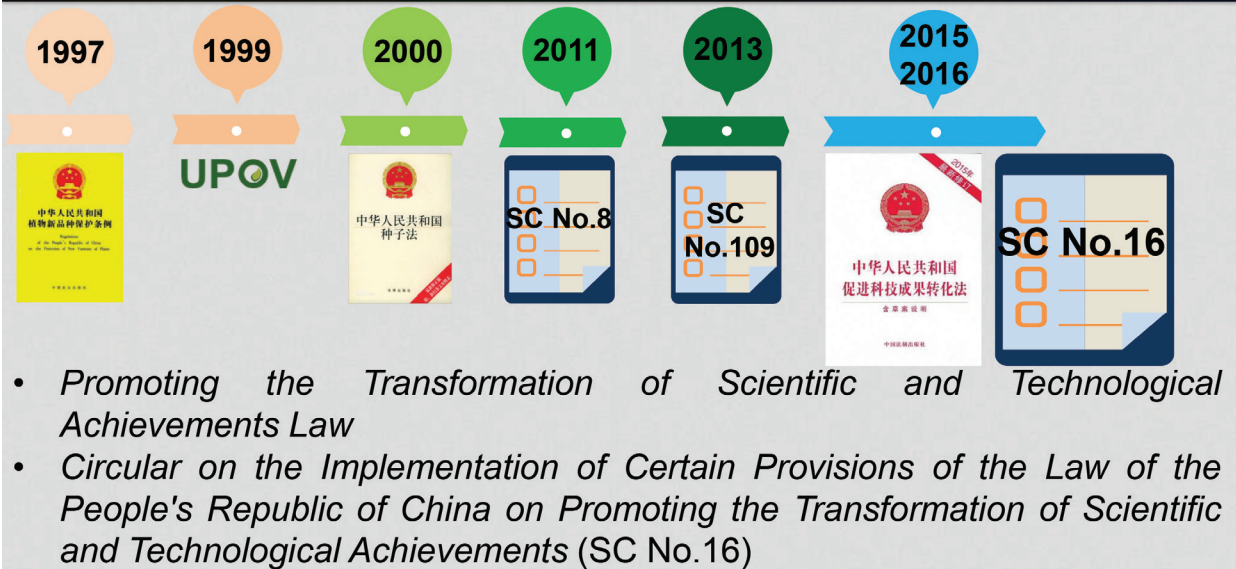
Opinions on Deepening the Institutional Reform and Improving the Innovation Capability of Seed Industry (SC No.109)



I. Policies and Regulations Concerning the Seed Industry



I. Policies and Regulations Concerning the Seed Industry



I. Policies and Regulations Concerning the Seed Industry



- *Opinions on Strengthening the Protection of Intellectual Property Rights*
- strengthen the protection of new plant varieties
- accelerate the procedures for examination and approval

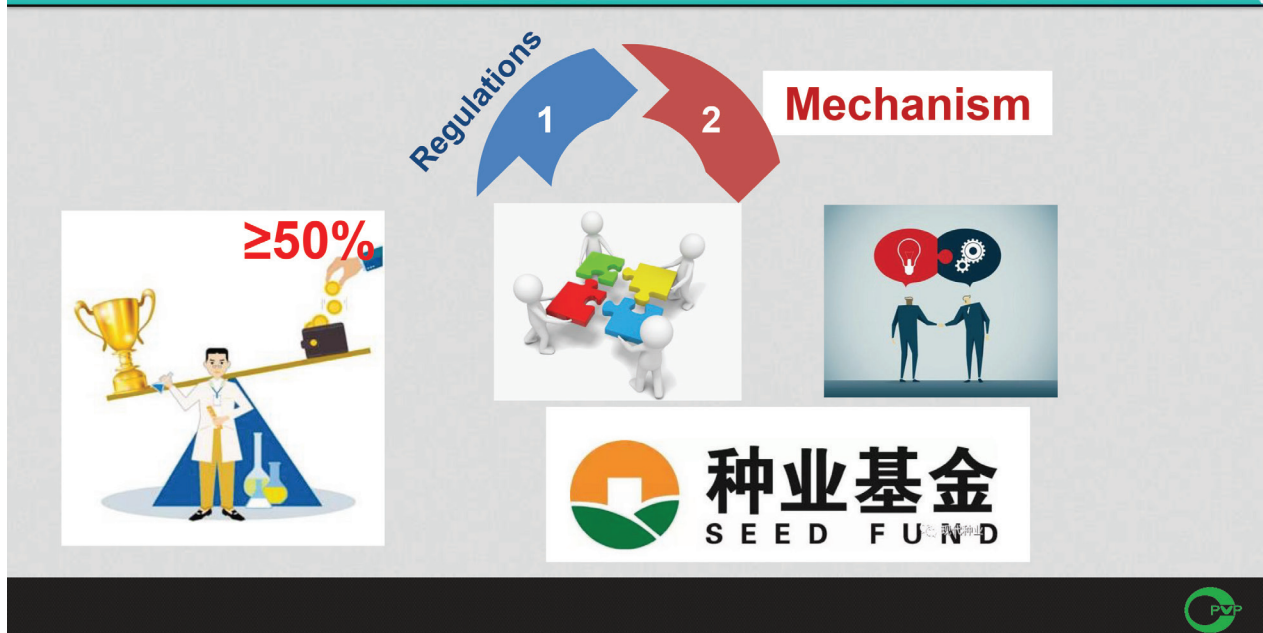


II. Policies Promote Plant Breeding Innovation and Development

Regulations



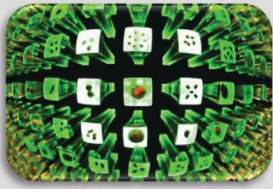
II. Policies Promote Plant Breeding Innovation and Development



II. Policies Promote Plant Breeding Innovation and Development

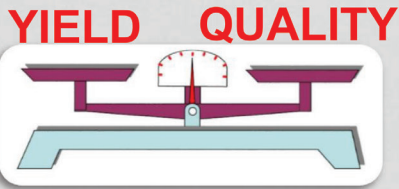


II. Policies Promote Plant Breeding Innovation and Development



Basic Theoretical Research
Germplasm Resources
Breeding Methods

Technology



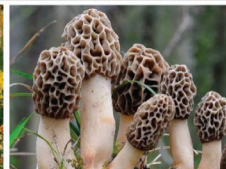
Environmentally friendly
Better resistance
Less cultivation
Adapt to mechanization



II. Policies Promote Plant Breeding Innovation and Development

Plant Breeding

1



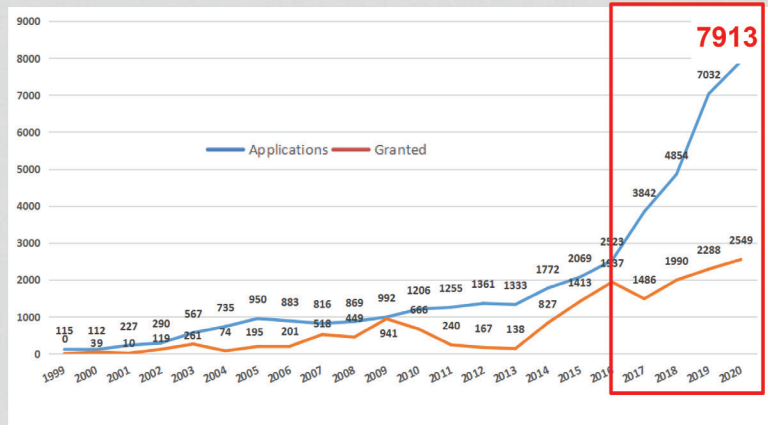
母本 F₁杂交种 父本



II. Policies Promote Plant Breeding Innovation and Development

Plant Breeding 1

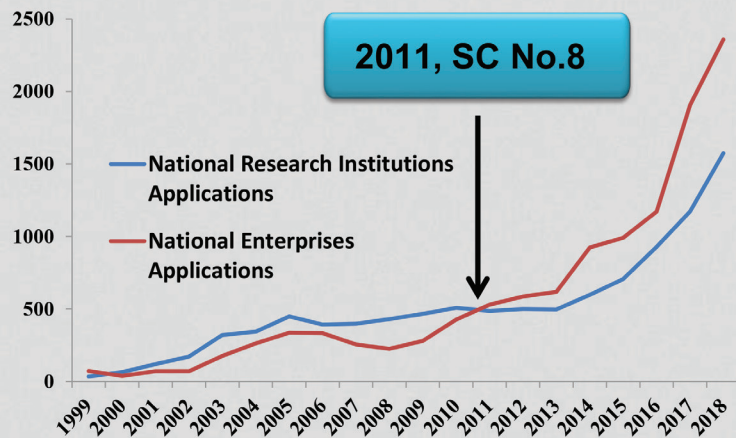
Plant Variety Protection 2



II. Policies Promote Plant Breeding Innovation and Development

Plant Breeding 1

Plant Variety Protection 2



II. Policies Promote Plant Breeding Innovation and Development

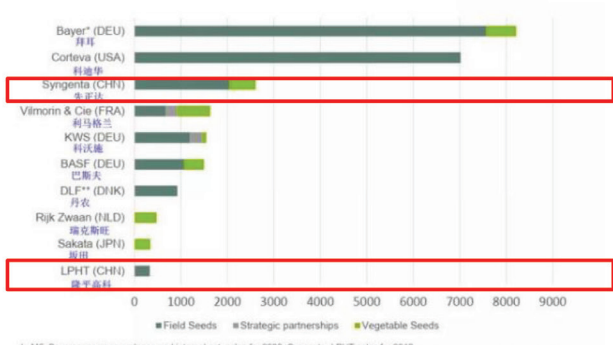
Plant Breeding 1

Plant Variety Protection 2

Enterprise Development 3



WORLDWIDE COMPETITIVE ENVIRONMENT FOR SEEDS



In ME: Sources: company release and internal est. sales for 2020. Syngenta, LPHT sales for 2019. Vilmorin & Cie and KWS before IFRS11. Strategic partnerships include 50% of AgReliant and Solis sales for Vilmorin & Cie and AgReliant and Kanfer sales for KWS.
 *Bayer field seed sales include soybean, corn and an internal est. of other field seed sales (cotton, rapeseed, wheat, rice & sorghum).
 **DLF seed sales retained excluding the vegetable seed multiplication business and the potato business.
 Exchange rate: EUR 1 = USD 1.11
 MARCH 2021



III. Outlook

UPOV 1991 Act



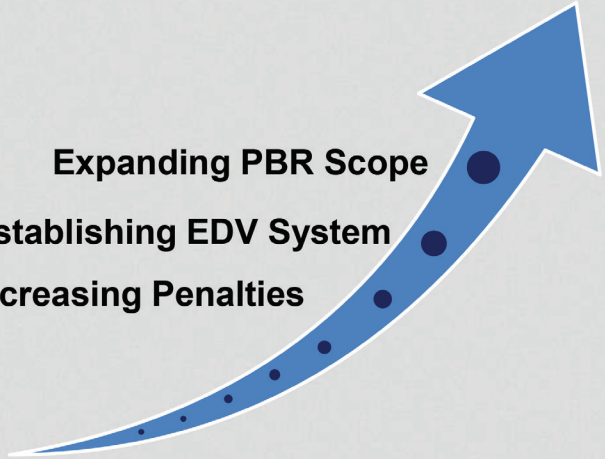
Seed Law



PVP Regulations

REVISING

Expanding PBR Scope
 Establishing EDV System
 Increasing Penalties



Thanks for your attention!



EUROPEAN UNION

EU STRATEGIES INVOLVING PLANT BREEDING AND PLANT VARIETY PROTECTION – EUROPEAN GREEN DEAL (FARM TO FORK STRATEGY)

MS. PÄIVI MANNERKORPI, Team Leader – Plant Reproductive Material,
Unit G1, Plant Health, Directorate General for Health and Food Safety
(DG SANTE), European Commission

In 2019, the European Commission announced the Green Deal,¹ an ambitious project for the European Union (EU) to become climate neutral by 2050. It maps a new, sustainable and inclusive growth strategy to boost the economy, improve people's health and quality of life, care for nature, and leave no one behind. It has links to several strategies.² The Farm to Fork Strategy,³ adopted in March 2020, is at the heart of the Green Deal and addresses comprehensively the challenges of sustainable food systems and recognises the inseparable links between healthy people, healthy societies and a healthy planet. It is also central to achieving the UN's Sustainable Development Goals.

Sustainable food systems rely on seed security and diversity. There is a need to make better use of plant genetic diversity and resources for adaptation, and to facilitate the broadening of supply. Integration of plant breeding in climate change strategies is one of the best paths to sustainable food production.⁴ The development of new and improved climate-proof plant varieties, which are, for example, more drought or flood tolerant or disease and pest resistant, play a central role in increasing sustainability, meeting the adaption needs of agriculture, reducing dependency on pesticides and making the food system more resilient. In order to boost innovation in plant breeding, a strong intellectual property (IP) rights system to protect innovation is of utmost importance. The efficiency and efficacy of the system, in particular variety testing, can be improved with modern tools. The central objective of the EU's policies is to continue to foster a modern and effective regulatory environment in plant breeding and seed production, under which innovation can thrive, along its political lines.

¹https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

²The Farm to Fork Strategy, the Biodiversity Strategy, the EU Adaptation Strategy, the new EU Forest Strategy, the European Digital Strategy and Commission Communication of Action Plan on Intellectual Property (IP).

³https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf

⁴<http://www.fao.org/3/at911e/at911e.pdf>

PRESENTATION MADE AT THE SEMINAR



EU strategies involving plant breeding and plant variety protection that address broad policy issues

Seminar on strategies that address policies involving plant breeding and plant variety protection

virtual meeting 20 October 2021

Päivi Mannerkorpi, European Commission

Changes in our working environment

Climate change

Demand for Sustainability

Population growth and demographic developments

Seed and food security
Crisis preparedness

Biodiversity loss

Environmental degradation

Bio-molecular techniques:

- genetic modification
- marker assisted techniques
- genome editing

Urbanisation

Globalisation

IT technologies:

- digitalisation
- big data
- blockchain
- robotics
- artificial intelligence



EU Green Deal

- Green Deal launched in 2019.
- Ambitious project for the EU to become **climate neutral by 2050**.
- It maps a new, sustainable and inclusive growth strategy
 - to boost the economy,
 - improve people's health and quality of life,
 - care for nature and
 - leave no one behind.
- Links to several strategies such as Farm to Fork, Biodiversity Strategy, IP action plan.



Farm to Fork Strategy

Adoption in May 2020.

At the heart of the Green Deal.

Addresses comprehensively the challenges of

- sustainable food systems and
- recognises the inseparable links between **healthy people, healthy societies and a healthy planet**.
- It is also central to achieving the **UN's Sustainable Development Goals**.

Agriculture is responsible for **10.3%** of the EU's GHG emissions and nearly 70% of those come from the animal sector. They consist of non-CO2 GHG (methane and nitrous oxide). The figures do not include CO2 emissions from land use and land use changes.



Farm to Fork Strategy

Food systems are one of the key drivers of climate change and environmental degradation.

Urgent need to reduce dependency on pesticides and antimicrobials, reduce excess fertilisation, increase organic farming, improve animal welfare, and reverse biodiversity loss:

- Reduce the overall use and risk of **chemical pesticides by 50%** and the use of more hazardous pesticides by 50% by 2030.
- Reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. This will reduce the **use of fertilisers by at least 20% by 2030**.
- Objective of at least **25% of the EU's agricultural land under organic farming by 2030**.



Farm to Fork Strategy

Sustainable food systems rely on **seed security and diversity**.

Farmers need to have access to a **range of quality seeds for plant varieties adapted to the pressures of climate change**

Potential of **new genomic techniques** to improve sustainability along the food supply chain - addressed, among other issues, in the recent Commission study on new genomic techniques and the announced policy action on plants obtained by targeted mutagenesis and cisgenesis.

➤ **Broad debate welcomed to formulate a sustainable food policy!**



Plant breeding key

Integration of plant breeding in climate change strategies is one of the best paths to sustainable food production.

Use of plant genetic diversity and resources to adapt and broaden food supply.

The development of new and improved **climate-proof plant varieties**, which are e.g. more drought or flood tolerance or disease and pest resistant, play a central role in increasing sustainability, meeting adaptation needs of agriculture, reducing dependency on pesticides and making the **food system more resilient and sustainable**.

Active plant breeding is a pre-condition for the **biodiversity of crops**, which are processed by breeding. Broadly based plant breeding also ensures the diversity of seeds and contributes to the **preservation of plant genetic resources**.

The central objective of the EUs policies is to continue to foster a **modern and effective regulatory environment** in plant breeding and seed production, under which **innovation** can thrive.



Plant breeding key

In order to boost innovation in plant breeding a strong IP rights system to protect innovation is of utmost importance under the changing environment.

Questions:

How can efficiency and efficacy of the plant variety protection system be improved?

How to deal with unpredictable nature and short and long terms impacts climate change?

How will plant breeding adapt: e.g. new breeding targets and strategies, new plant species and moving target environments?

How can the system support the needs of and changes in plant breeding?



Thank you



JAPAN

JAPAN'S INTELLECTUAL PROPERTY STRATEGY IN THE FIELD OF PLANT VARIETY PROTECTION

MR. TERUHISA MIYAMOTO, Deputy Director of Plant Variety Office,
Intellectual Property Division, Export and International Affairs Bureau,
Ministry of Agriculture, Forestry and Fisheries (MAFF)

1 INTELLECTUAL PROPERTY POLICY IN JAPAN

“MAFF’s Intellectual Property Strategy 2025” was approved in April 2021. This strategy indicates the direction of Japan’s Intellectual Property (IP) Policy clearly. Its objective is Creation, Protection, and Implementation of Intellectual Property in the field of Agriculture, Forestry, Fisheries and Food Industry, such as, Plant Variety Protection (PVP), Geographical indications (GI), Trademark, Genetic Resource of Wagyu beef, etc., for enhancement of Japan’s international competitiveness of Agriculture, Forestry, Fisheries and Food Industry.

Especially in the field of PVP, four solid directions are clarified to improve and enhance Japan’s PVP system. MAFF will decide and implement IP Policy in line with the following directions:

1. Protection against unintended outflow of protected varieties
 - The amendment of the Plant Variety Protection and Seed Act
 - Promotion and support for acquisition of Plant Breeders’ Rights (PBR) outside of Japan
 - Enforcement of cooperation with PVP offices in Asia region
2. Proper evaluation of intellectual property
3. Promotion and creation of production area for each crop with PBR
4. Enforcement of PBR to enable right holders to exercise their right

2 CURRENT SITUATION SURROUNDING THE PVP SYSTEM IN JAPAN

Japan’s agriculture industry has been supported by superior new plant varieties. Super-high-yield rice or pears resistant to disease and pests provide farmers with great benefits, enabling high productivity. Easy-to-peel chestnuts are popular among consumers. Both farmers and consumers enjoy many benefits from the development of new plant varieties that meet environmental and consumer preferences. This is a typical outcome of the PVP.

Breeding a new plant variety requires a lot of time and costs. In the case of the famous grape variety “Shine Muscat” developed by the National Agriculture and Food Research Organization, it took 33 years from the first selection of the parent line to its registration. In the last 18 years alone, 13 researchers have been engaged in the development of the variety. Thanks to the efforts put in to the development of this great variety, the transaction price of “Shine Muscat” is

two times higher than the price of other grape varieties, contributing to the increase in farmers' income. Consumers also love its taste; accordingly, its cultivation area is increasing.

As a member of UPOV 91, Japan has protected new varieties and the number of PBR titles in force are increasing. Regarding crop type, almost 80% of titles are owned by breeders of flowers and trees. Regarding right holder type, almost 50% are owned by seed companies, but 25% are owned by individual breeders. Individual breeders are mainly local farmers and are also engaged in breeding. That is to say, local farmers have also enjoyed benefits from the PVP system. Analyzing the percentages of rights holders for each crop in more detail, the varieties of sensitive crops for national food security, such as, rice, wheat, beans, and potato, are mostly bred by public institutes. Almost half of the fruit and vegetable varieties are also bred by public institutes or domestic companies and individual breeders.

However, the situation surrounding the PVP system in Japan is changing. Recently, the annual number of applications and registrations from both domestic and foreign applicants has decreased. Many factors which result in the stagnation of applications and registrations could be considered, such as the aging of breeders, or the fact that breeders cannot earn enough income to compensate for their investment in breeding. This fact results in the stagnation of breeding activities, and consequently farmers cannot use/select good-quality seeds and consumers cannot enjoy a variety of food. This situation needs to be improved.

In order to further explain the current situation surrounding the PVP system in Japan, it is necessary to refer the case regarding the unintended outflow of "Shine Muscat", developed in Japan in 2006. To provide background to this case, two factors are identified:

1. Because the domestic seedling market was large enough to sustain breeding activities, Japanese breeders tended not to immediately apply for PBRs for their new varieties outside Japan.
2. Under Japan's PVP Act before its amendment, once a protected seedling is released to the market, the PBR of that seedling is exhausted on export.

Consequently, the production, trade, or marketing of "Shine Muscat" has been widespread in Asia, which was not the intention/strategy of the breeder of "Shine Muscat" at all. This situation not only caused a loss of Japan's export market, but also damage to Japan's brand.

To improve the current situation surrounding the PVP system in Japan, we amended the PVP and Seed Act. However, through the process of the amendment, many major misunderstandings emerged from a variety of sectors, such as some farmers' groups, consumer groups, or other groups unrelated to agriculture. Most of the farmers and breeders did understand the objective

of the PVP Act and its amendment, but were sometimes confused by the misunderstandings of the aforementioned groups.

One of the major misunderstandings was that “existing plant varieties will be registered by large companies”: the answer to this misunderstanding is always that “No, it is impossible. The PVP system does not allow existing plant varieties to be registered.” Even if applications are made for existing plant varieties to be registered, these will be rejected following examination. Cases of misregistration have never happened in the past.

Another big misunderstanding is “Farmers are forced to use a particular protected variety”: the answer to this misunderstanding is “No, farmers can always freely select varieties to be planted, including non-protected varieties that are widely and freely distributed.” If farmers intend to select a protected variety because of its merits such as high yield or disease tolerance, they need to receive authorization by the right holder. However, if farmers select non-protected varieties, there are no regulations in the PVP Act. To improve the situation, as a percentage of non-protected varieties dominate Japan’s seed market, farmers have a wide range of choice. That is the merit of the PVP system.

In order to address Japan’s current situations and challenges, MAFF reviewed and amended the PVP and Seed Act in December 2020, with a view to providing PBR holders with legal measures to exercise their rights effectively. The main points of the Amendment of the Plant Variety Protection and Seed Act are as follows:

1. Designation of export destination country by right holders [In Effect]
2. Designation of domestic cultivation areas by right holders [In Effect]
3. Any acts in respect of the propagating material of protected varieties (including use of farm saved seeds) shall require the authorization of right holders (except with “Compulsory exceptions”) [Effective April 1, 2022.]
4. Mandatory labeling as a protected variety [In Effect]
5. Setting of examination fees, reduction of application and registration fees [Effective April 1, 2022.]
6. Measures to facilitate the utilization of breeders’ rights (counter-measure against infringement) [Effective April 1, 2022.]
 - Use of the characteristics table identified at the DUS examination
 - Introduction of a revision system to the characteristics table before registration

- Establishment of a system to request advisory opinion by the Minister of Agriculture, Forestry and Fisheries
7. Review of employees' breeding regulations [In Effect]
 8. Mandatory appointment of an agent in Japan (in case of application from foreign countries) [In Effect]
 9. Clarification of labeling at the time of sale of designated seeds and seedlings [In Effect]
 10. Other major revisions

3 JAPAN'S INTERNATIONAL PVP COOPERATION

Japan has established a PVP cooperation framework in cooperation with the East Asia Plant Variety Protection Forum (EAPVP Forum) and UPOV in the east Asian region. Through many activities of the EAPVP Forum, Japan contributes not only to promoting capacity building, but also to develop "e-PVP Asia", which is a single online platform used for submitting application data to plural authorities and assisting cooperation in DUS examination. "e-PVP Asia" will assist both breeders and PVP authorities.

Breeders can make applications for their varieties to several countries in one application. An application will be sent to each authority through the UPOV PRISMA scheme. In the case that applicant A in country II makes an application for their variety to country I, II, and III and at the same time a DUS test is conducted in country II, the other two countries could take over the DUS test report issued by country II. This scheme can save time and costs for application/examination. Minimizing the number of DUS examinations abroad also removes a lot of border measures, such as, phytosanitary quarantine.

"e-PVP Asia" will also provide a common online application system and electronic application management system to the PVP office. That means that each PVP office does not need to develop its own database system; the core system is developed by UPOV.

It will also enhance DUS cooperation among PVP offices of participating countries to address capacity gaps in DUS examination.

Currently, "e-PVP Asia" is being developed by Japan, Viet Nam, UPOV, and other provisional UPOV member countries, aiming for an official launch in 2022.

Japan will continue to commit to sustainable agriculture and food industries through cooperation activities for the enlargement of the UPOV PVP system in the East Asia region.

PRESENTATION MADE AT THE SEMINAR

20th October 2021
UPOV Seminar on strategies that address policies involving PB and PVP

The Plant Variety Protection System in Japan and Japan's PVP Cooperation

Teruhisa MIYAMOTO

Deputy Director
Plant Variety Protection Office, Intellectual Property Division
Export and International Affairs Bureau, MAFF of Japan



1. Intellectual Property Policy in Japan

MAFF's Intellectual Property Strategy 2025 on the field of PVP

Objectives of MAFF's Intellectual Property Strategy 2025

- Creation, Protection, and Implementation of Intellectual Property in the field of Agriculture, Forestry, Fisheries and Food Industry, such as, PVP, GI, Trademark, Genetic Resource of Wagyu beef, etc., for enhancement of Japan's international competitiveness of Agriculture, Forestry, Fisheries and Food Industry



Especially, for PVP;

- 1) Protection against unintended outflow of protected variety
 - The Amendment of Plant Variety Protection and Seed Act
 - Promotion and Support for acquirement of PBR outside of Japan
 - Enforcement of cooperation with PVP Offices in Asian region
- 2) Proper Evaluation of Intellectual Property
- 3) Promotion and Creation of production area for each crop with PVR
- 4) Enforcement of PBR to enable right holders to exercise their right
 - Development of technology with DNA analysis which could identify pirated products, or infringed products



2

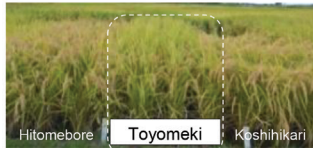
2. Current situation surrounding PVP System in Japan

Japan's Agriculture Supported by Superior New Plant Varieties

- **New plant variety** is one of important factor supporting the **development of agriculture in Japan**.
- **Both farmers and consumers enjoy a lot of benefits** from the **development of new plant varieties** that meet environmental and consumers' preferences, such as, improved productivity, better taste etc.

[Super high-yield rice]

Super high-yield paddy rice "TOYOMEKI", of which yield is 800 kg/10a or more, 1.5 times more than other varieties



[Chestnuts easy to peel]

Japan chestnut "Porotan", which can be very easily peeled and cooked.



[Pears resistant to disease and pests]

Pears "Gold Twentieth Century", resistant to black spot disease which is the weaknesses of conventional varieties



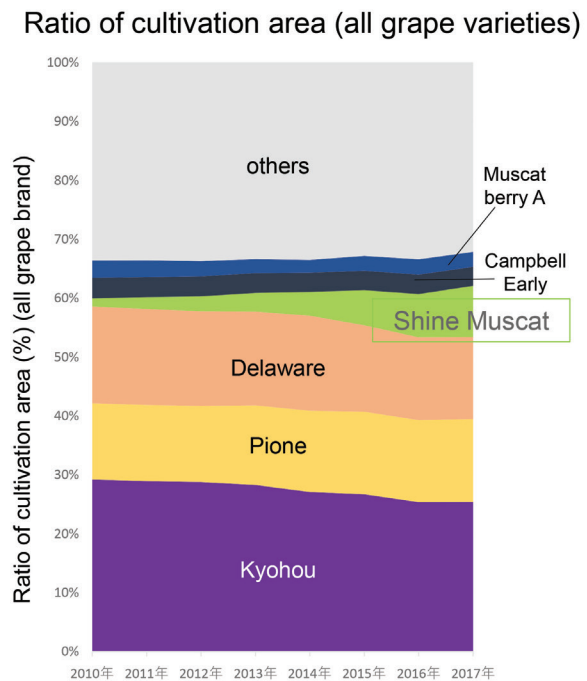
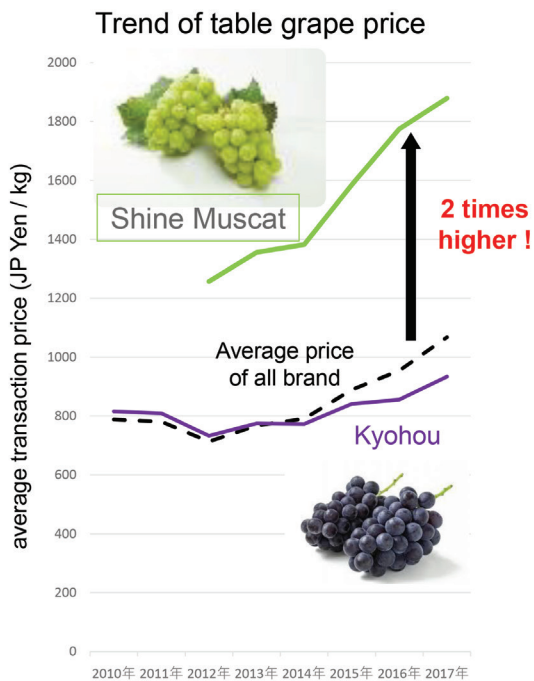
[Cold-resistant and delicious rice]

Paddy rice "Kirara 397" has achieved unprecedented excellent taste in addition to cold resistance. This variety led to the later strategy of brand-name rice.



4

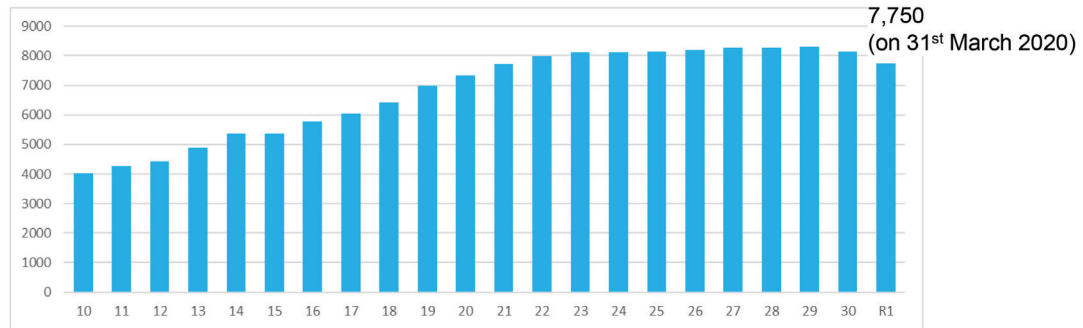
Effect of the PVP (table grape variety "Shine Muscat")



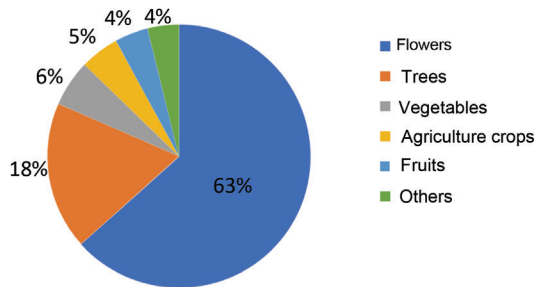
5

Trend of PBR Titles in force (by crop type, right holder type)

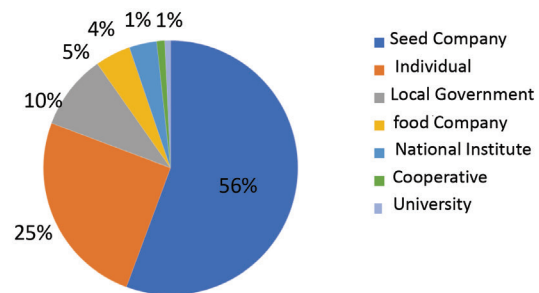
Trend of PBR Titles in force (JP fiscal year)



Percentage of protected varieties (by crop type)



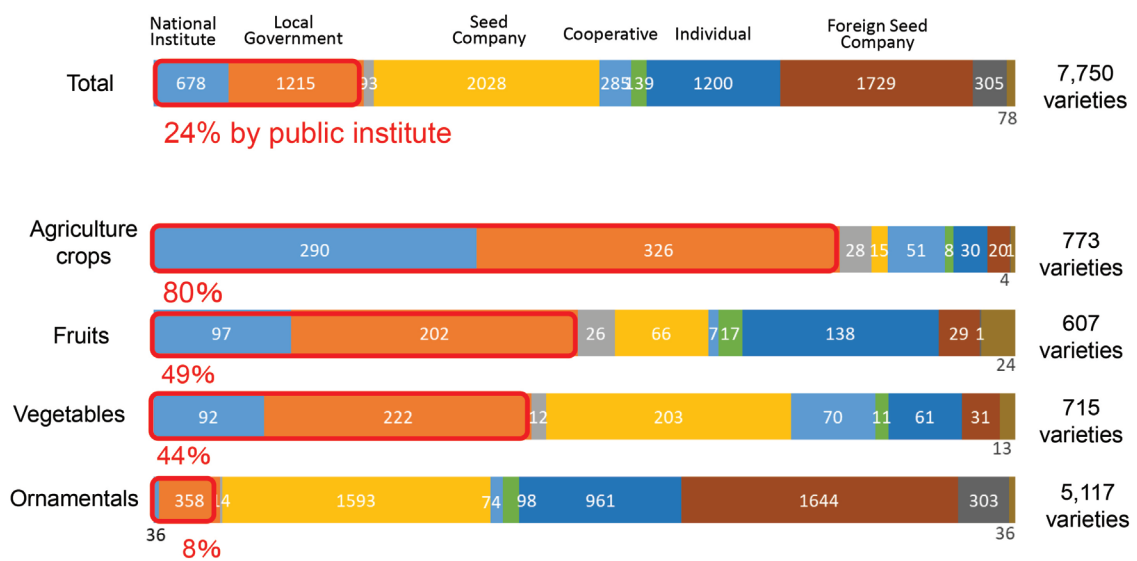
Percentage of protected varieties (by right holder type)



6

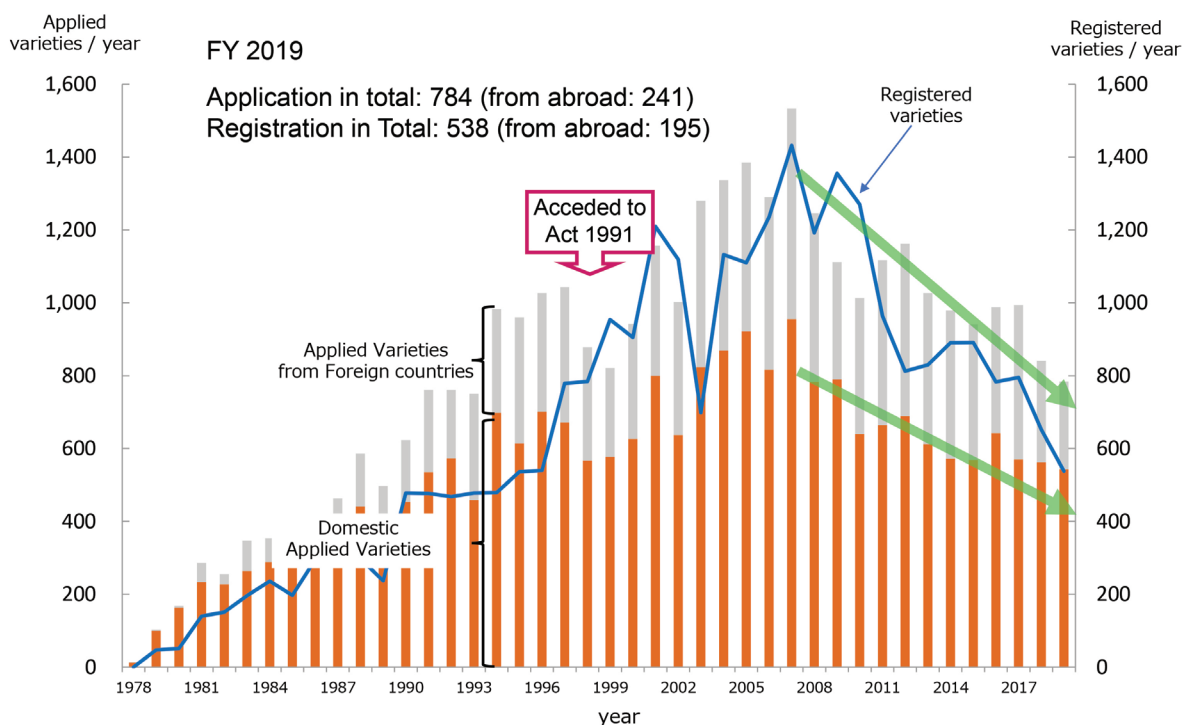
Trend of PBR Titles in force (by crop type, right holder type)

- Sensitive crops for national food security, such as, rice, wheat, beans, potato, fruits and vegetables, are bred by **public institute**, **domestic companies**, or **individual**.



7


Trend of annual PBR Application and Grant



8


Case Unintended outflow of plant varieties developed in Japan

Shine Muscat



【Japan】

- Bred in Japan
- Registered in 2006
- Period of breeding is 33 years !!
- It has a strong sweetness, excellent taste, and can be eaten with the skin, so it is traded with high price.
- It is high expected as a main product of export.



As the background of this case, two factors are identified:

1. Because domestic seed/seedling market was large enough to sustain breeding activities, Japanese breeders haven't tended to acquire PBRs for their new varieties outside Japan.
→ Duration of Novelty was already over, and breeders could not apply for their variety to overseas
2. Under the Japan's PVP Act before its amendment, once a protected seedling is released to the market, PBR of that seedling is exhausted on export.

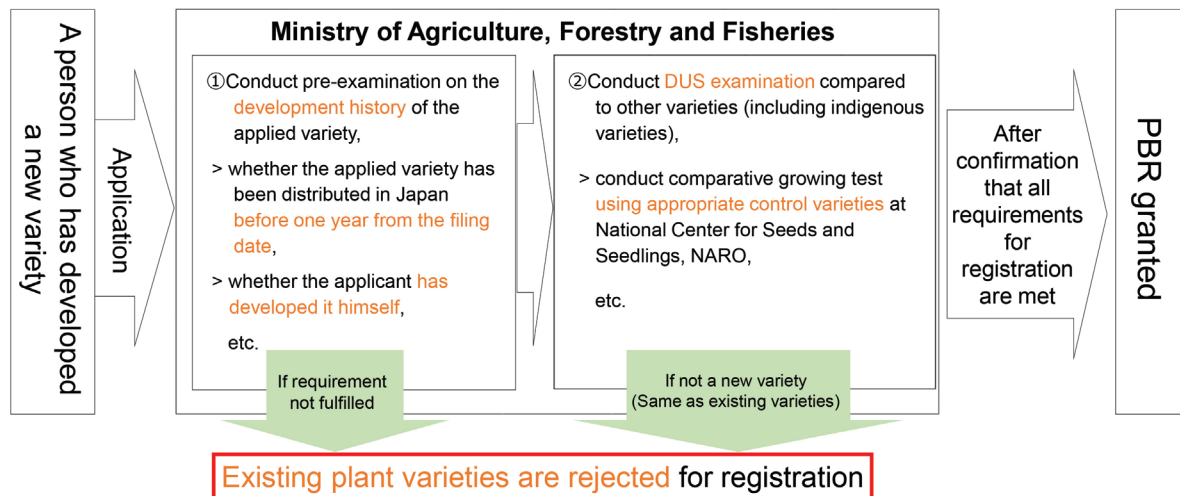

 Consequently,,,

Production, Trade, or Marketing of "Shine Muscat" has been widely spread in Asia, and which is **not the intention/strategy of the breeder of "Shine Muscat" at all.**

→ This situation caused not only a loss of Japan's export market, but also damage of Japan's Brand

9

Big Misunderstanding “existing plant varieties will be registered by large companies”

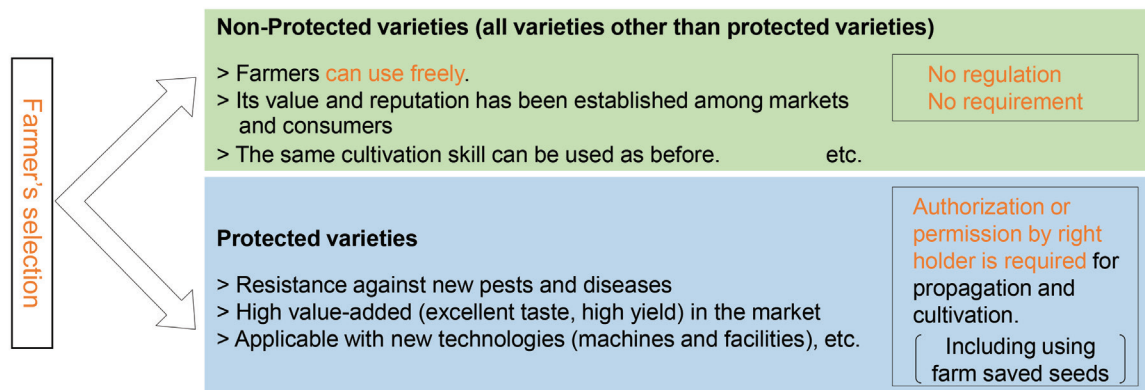


Misregistration cases have never happened in the past, but,

- In case it is found that an existing variety (including indigenous varieties) is registered by mistake,
 ⇒ **Nullity of registration**
- In case it is found that the information on the application for the registered variety is false, such as, declaring false development history on purpose.
 ⇒ **Criminal penalties** (individuals: imprisonment for not more than 3 years or a fine of not more than 3 million yen; corporations: a fine of not more than 100 million yen)

Big Misunderstanding “Farmers are forced to use a particular protected variety”

- The PVP and Seed Act is a system **to prevent unauthorized propagation or cultivation of “protected varieties”**.
 - This Act does **never force farmers to choose a particular protected variety**.
 - Farmers **can select varieties freely** to be planted, including **non-protected varieties* that are widely and freely distributed**.
- non-protected varieties : 1) indigenous varieties, 2) varieties that have never been registered, 3) varieties whose registration period has expired



	Rice	Mandarin Oranges	Apple	Grape	Potato	Vegetable
Percentage of protected varieties	17%	3%	5%	13%	10%	9%

Challenges of Japan

- **Lack of awareness** around importance of PVP system
- **Unintended outflow** of Japan's excellent varieties to overseas
 - Undermine competitiveness
 - Lose potential foreign markets
- **Stagnation of the number of application** for PBR in Japan
 - may result in reduce innovation of Japanese agriculture new breeding technology
- To promote and enhance **competitiveness of breeding on both public and private sector**
 - to develop new plant varieties for needs of farmers and consumers, etc.
- To enlarge **UPOV system**, and to develop, implement and maintain **cooperation system** of application and examination procedure in east Asia (**e-PVP Asia**)
- To Harmonize with **UPOV PRISMA**



Japan's PVP and Seed Act was amended in December 2020

- with a view to providing PBR holders with legal measures to exercise their right effectively

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3. The main points of Amendment of the Plant Variety Protection and Seed Act

Main points of the amended Plant Variety Protection and Seed Act

- I. Designation of export destination country by right holders [Effective]
→ PBR holders will be able to restrict their protected varieties to be brought to foreign countries.



- II. Mandatory labeling as a protected variety [Effective]
→ all protected varieties should be accompanied with labeling on each package,
1) The fact that the seed has been registered as a protected variety,
2) That there are restrictions by right holders on bringing overseas.



- III. Any acts in respect of the propagating material of protected varieties shall require the authorization of right holders (except with “Compulsory exceptions”) [Effective from April 1, 2022.]

→ PBR are strengthened to extend to any acts, including the propagation of protected varieties by farmers.



- IV. Change of Examination, Application and Registration fees [Effective from April 1, 2022.]
→ to cover the actual cost for growing trial or on-site inspection,
to reduce the total cost of maintaining the registration for a long period.

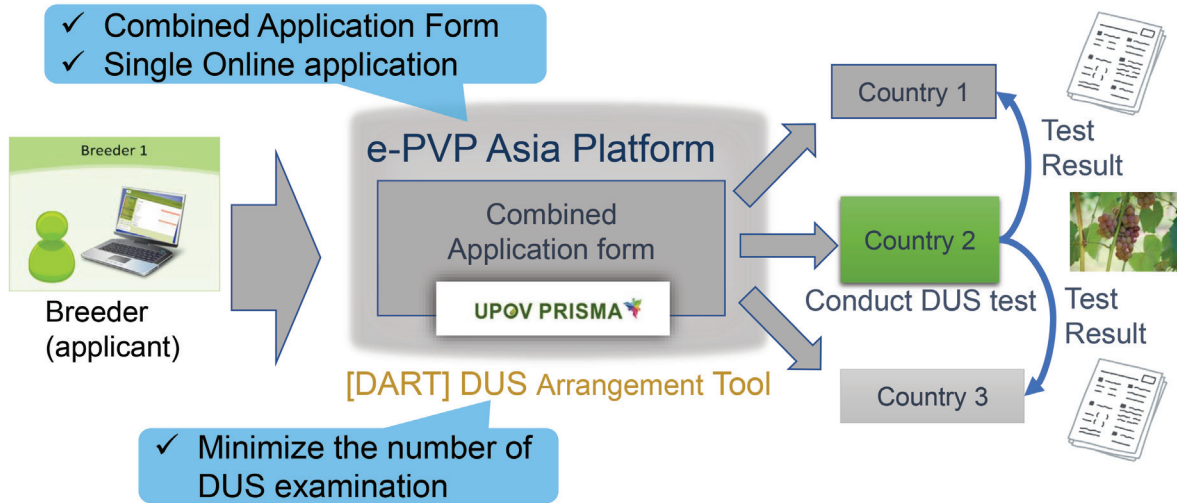


- V. Other revisions

14

4. Japan's International PVP Cooperation

What is “e-PVP Asia”



- Current participating countries: JP, VN, BN, MM, MY
Observers: other EAPVP Forum members
- Resource partner: UPOV Office

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Thank you very much for your attention !!



Teruhisa MIYAMOTO (Mr.)
Deputy Director of Plant Variety Office, Intellectual Property Division,
Export and International Affairs Bureau, MAFF

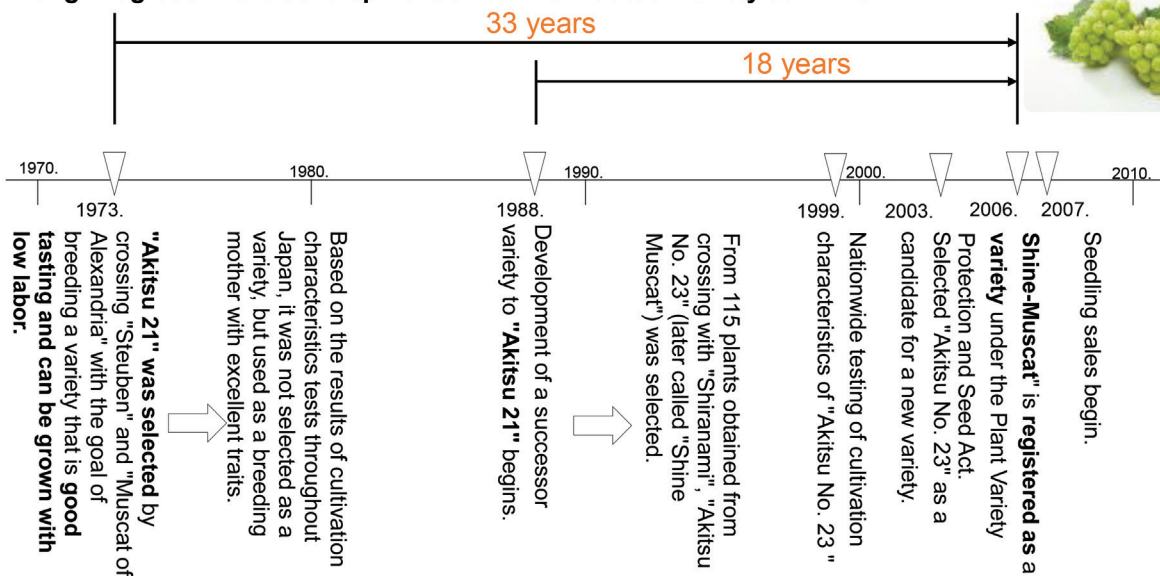
e-mail teruhisa_miyamoto170@maff.go.jp

Reference material

New Plant Variety Development requires a lot of time and cost.

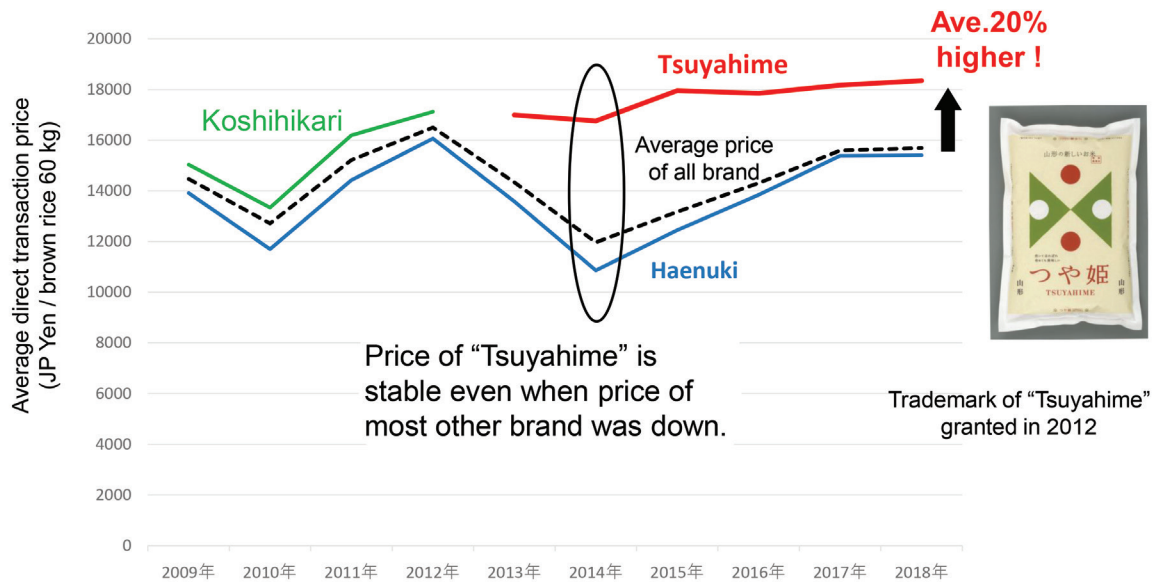
- The grape variety "Shine Muscat" developed by the National Agriculture and Food Research Organization(NARO) took **33 years** from the selection of the parent line "Akitsu 21" to its registration, and **18 years** from the start of crossbreeding tests of "Akitsu 21".
- In the last 18 years alone, **13 researchers have been involved in the development of the variety.**

Long Progress in the development of "Shine Muscat" variety at NARO



Effect of the PVP (rice variety "Tsuyahime")

Trend of price in Yamagata pref.

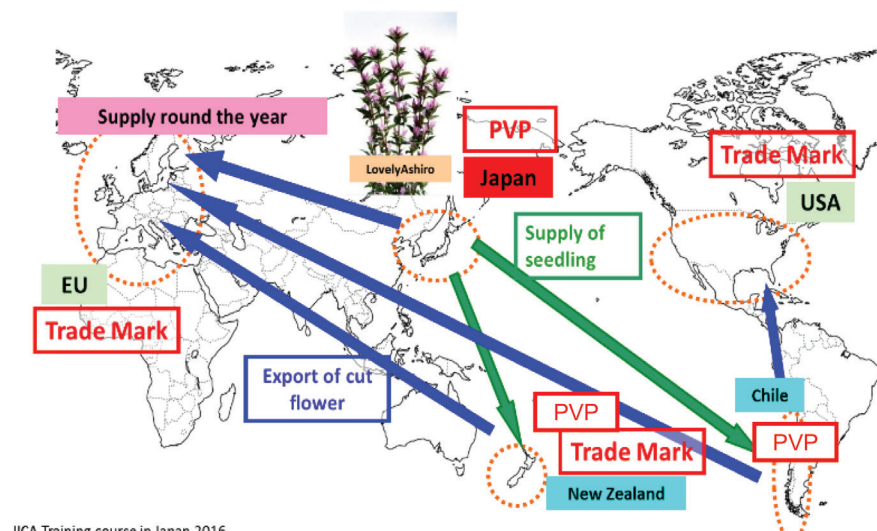


20

Effect of the PVP (Promotion of variety in the International Market)

安代りんどう: ASHIRO RINDO (Gentian)

- "PBR and TM granted" are also granted in third countries
- Producers not only export their flowers but also supply seedlings to producers in Southern hemisphere by contract with royalty.
- ASHIRO gentian is now shipped to EU and USA all year



JICA Training course in Japan 2016

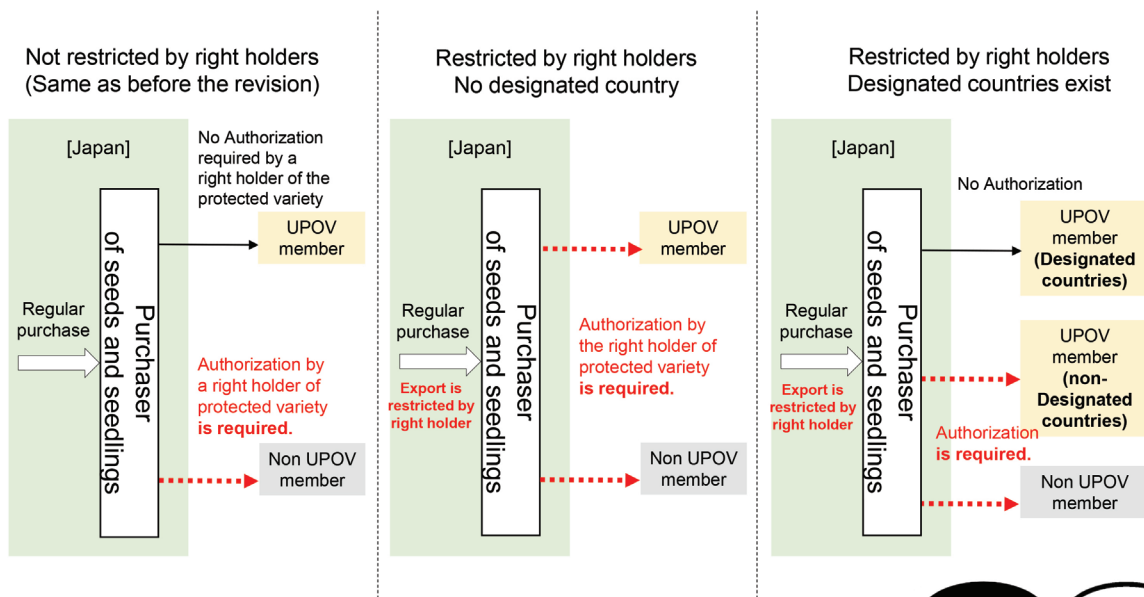
21

The main points of Amendment of the Plant Variety Protection and Seed Act

Overall points of the amended Plant Variety Protection and Seed Act

1. Designation of export destination country by right holders [Effective]	6. Measures to facilitate the utilization of breeder's right (counter measure against infringement) [Effective April 1, 2022.]
2. Designation of domestic cultivation areas by right holder [Effective]	(1) Use of the characteristics table (2) Introduction of a correction system (3) Establishment of a judgment system
3. Any acts in respect of the propagating material of protected varieties shall require the authorization of right holders (except with "Compulsory exceptions") [Effective April 1, 2022.]	7. Review of employee's breeding regulations [Effective]
4. Mandatory labeling as a protected variety [Effective]	8. Mandatory appointment of an agent in Japan (in case of application from foreign countries) [Effective]
5. Setting of examination fees, Reduction of application and registration fees [Effective April 1, 2022.]	9. Clarification of labeling at the time of sale of designated seeds and seedlings [Effective]
	10. Other major revisions

Designation of export destination country by right holders



- When dealers transfer seeds / seedlings of registered varieties, **all protected varieties should be accompanied with labeling** on each package;
 - The fact that the seed has been registered as a protected variety, and
 - That there are **restrictions by right holders on bringing overseas**.



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Mandatory labeling as a protected variety

- When dealers transfer seeds / seedlings of protected varieties, **all protected varieties should be accompanied with labeling** on each package;
 - The fact that the seed has been registered as a protected variety, and
 - That there are **restrictions by right holders on bringing overseas**.

○ Mandatory labeling that the variety is protected by PVP Act

> One of the following.

- The words "**protected variety**", or,
- the words "**variety registration**" and "**number of registration**"

③ PVP Marks;



> The name of the protected variety should be written when transferring


○ Mandatory labeling that the variety is protected to be exported / could be cultivated in a designated area

○ Measures of labeling

- In the case of **transfer** or **display**, the labeling must be **directly accompanied with each bag, can**, etc. of the seed. (collective indication is not allowed.)
- In the case of **advertisements**, display on the advertisement itself (catalog, internet posting, etc.)

[Examples of labeling]

Varietal Name: Noulin Yellow
This variety is a protected variety.
Prohibited to be taken out of Japan, cultivation allowed only in Tokyo (see public notice (Ministry of Agriculture, Forestry and Fisheries website))

Varietal Name: Noulin Yellow 
Prohibited to carry out overseas
(with public notice by the Minister of Agriculture, Forestry and Fisheries)

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Any acts in respect of the propagating material of protected varieties shall require the authorization of right holders (except with “Compulsory exceptions”)

- Authorization by right holders is required for the propagation of protected varieties by farmers.

In the case where seeds/seedlings are purchased annually, or where license fee for repeatable propagation is included in the initial seed cost, there will be no change under the amended Act.

- Because farmers can acknowledge the conditions on use of varieties correctively in the contract, etc., more appropriate management of varieties are expected.
- It is also possible for an organization, cooperative etc. to collectively receive exclusive / non-exclusive license from right holders for the propagation by individual farmers.
- If right holder clearly indicates that his protected variety is not required licensing procedures for propagation, farmers may reproduce propagating material as before without any new procedures.

As a method of clearly indication that licensing procedures are not required, the followings might be considered; labeling on seeds/seedlings at the time of transfer, explanation in catalogs or public notice issued by right holder, notice on the website administrated by right holder, etc.

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Setting of Examination fees Reduction of Application and Registration fees

- For applied varieties on or after April 1, 2022,
 - > Applicants need to pay examination fee as an equivalent to the actual cost for growing trial or on-site inspection.

[Draft of Examination fee]

the actual cost based on the past examination results was estimated about 93,000 yen per time (year).

If applicants request additional examination for characteristics (those that require special investigation or testing for pest resistance, etc.), additional cost should be paid.



- > On the other hand, the application fee and registration fee is lowered to reduce the total cost of maintaining the registration for a long period. (details will be stipulated in the Ministerial Order)

		Current level	Under the amended Act
Application Fee		47,200 yen	14,000 yen
Annual Registration Fee	1-3 years	6,000 yen	4,500 yen (Under consideration)
	4-6 years	9,000 yen	
	7-9 years	18,000 yen	
	After 10 years	36,000 yen	30,000 yen



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KENYA

THE ROLE OF PLANT VARIETY PROTECTION IN PROMOTING FOOD SECURITY, EMPLOYMENT CREATION AND IMPROVING FARMERS' LIVELIHOODS

MR. SIMON MUCHERU MAINA,
Head, Seed Certification and Plant Variety Protection,
Kenya Plant Health Inspectorate Service (KEPHIS)

INTRODUCTION

Agriculture is the backbone of the Kenyan economy, where it contributes approximately 33% of the Gross Domestic Product (GDP). It employs more than 40% of the total population and 70% of the rural population. A thriving agricultural sector needs to be supported by a reliable input supply. Seed of the right variety is one of the most critical inputs for increased productivity and the resultant food security and income generation.

The need for food security and income generation has seen the development of superior varieties with relevant attributes. The Government of Kenya has put in place measures to promote variety development by both the public and private sectors. These measures include the establishment of a policy and legislative framework to promote variety development. The framework consists of: The Constitution of Kenya; The Seed Policy; and The Seeds and Plant Varieties Act, among others.

THE CONSTITUTION OF KENYA, 2010

The Constitution of Kenya, as promulgated in 2010, lays strong emphasis on the protection of intellectual property. This is as provided in the following provisions:

- i. Article 11(2) – “The State shall: (c) promote the intellectual property rights of the people of Kenya”.
- ii. Article 11(3) – “Parliament shall enact legislation to: (b) recognise and protect the ownership of indigenous seeds and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya”.
- iii. Article 40(5) – “The State shall support, promote and protect the intellectual property rights of the people of Kenya”.

These provisions have been incorporated in relevant Acts of Parliament, among them the Seeds and Plant Varieties Act.

THE NATIONAL SEED POLICY, 2010

The National Seed Policy was launched in 2010 and identified, among other aspects, the need to promote plant variety development in Kenya. Specifically, the policy identified the need to

harmonize Kenyan laws with international systems that promote variety development and international movement of seeds. In response, the Seeds and Plant Varieties Act was reviewed in 2012 to incorporate aspects of the UPOV Convention of 1991.

PLANT VARIETY PROTECTION LAWS

Legislation for protection of plant varieties in Kenya is contained in the Seeds and Plant Varieties Act (1972), which became operational in 1975, was reviewed in 1991 and 2012, and amended in 2016. Official regulations to guide the implementation of plant variety protection were developed in 1994.

The office to administer PVP was established in 1997 and has functioned under the *Kenya Plant Health Inspectorate Service (KEPHIS)* since 1998.

UPOV CONVENTION

Kenya joined UPOV under the 1978 Convention in 1999. The Seeds and Plant Varieties Act was reviewed in 2012 to incorporate aspects of the 1991 Act of the UPOV. In May 2016, Kenya acceded to the 1991 Act of the UPOV Convention.

Kenya grants PBRs for all plant genera and species.

STATUS OF PLANT VARIETY PROTECTION

A total of 1,826 applications for PVP were received by March 2021. Among these, 29% were local, while 71% were foreign. Of the local applications, 77% were from public institutions, while 23% were from private institutions.

The majority of the applications are for ornamentals, particularly cut flowers, followed by cereals and industrial crops. Most of the ornamental applications are foreign, while most cereals and industrial crops are Kenyan. Cereal applications are dominated by maize, the staple food security crop, while industrial applications are dominated by tea, the lead industrial crop in Kenya.

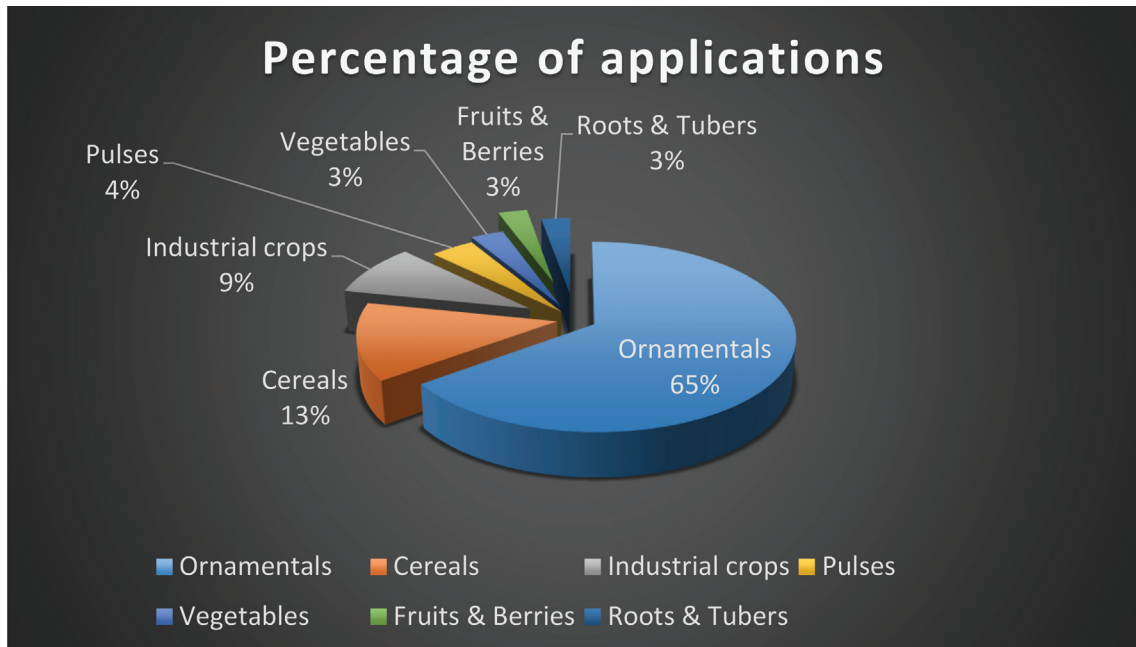


Figure 1. Distribution of PBR applications in 2020.

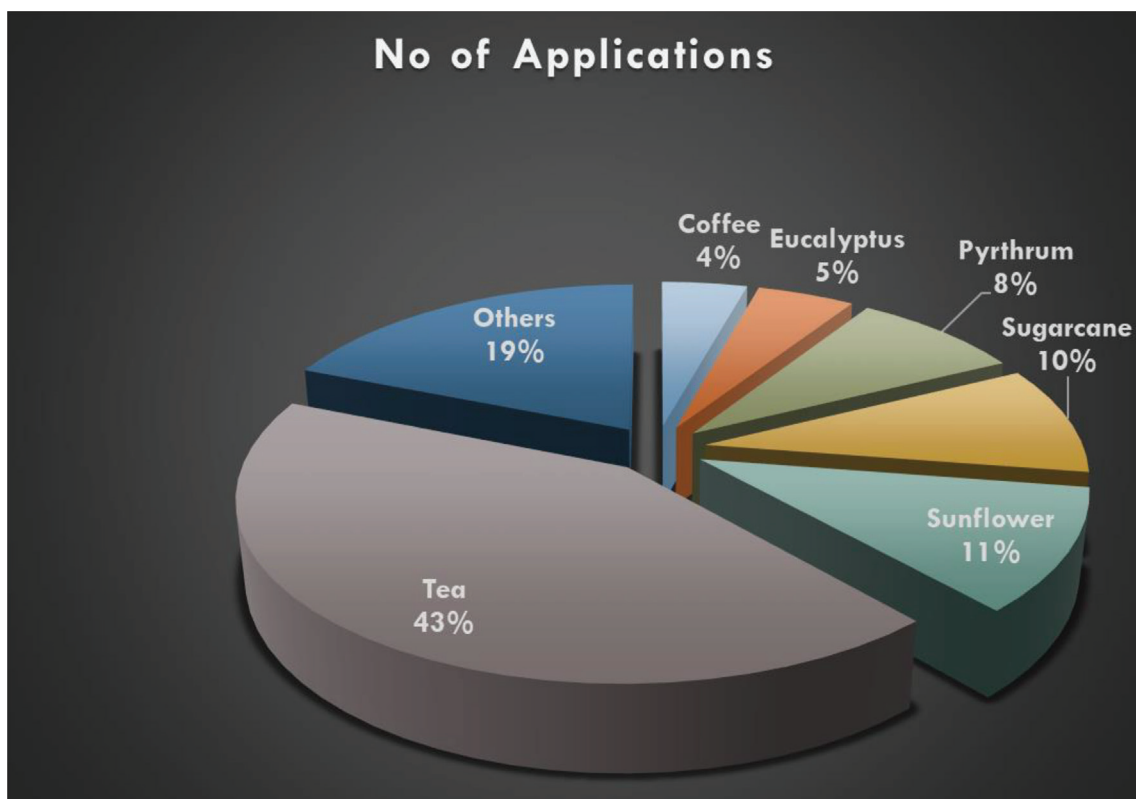


Figure 2. Distribution of applications for industrial crops in Kenya.

7 IMPACT OF PLANT VARIETY PROTECTION IN KENYA

Cut flower industry

The floriculture sub-sector in Kenya has recorded growth in the volume and value of cut flowers exported every year. The Kenyan floriculture market was valued at USD 861.6 million in 2018. In the year 2020, 142,477.8 MT of fresh flowers valued at USD 1.09 billion was produced in Kenya. It is estimated that the floriculture industry employs over 500,000 people and impacts more than 2 million livelihoods indirectly (Central Bank of Kenya, 2021).

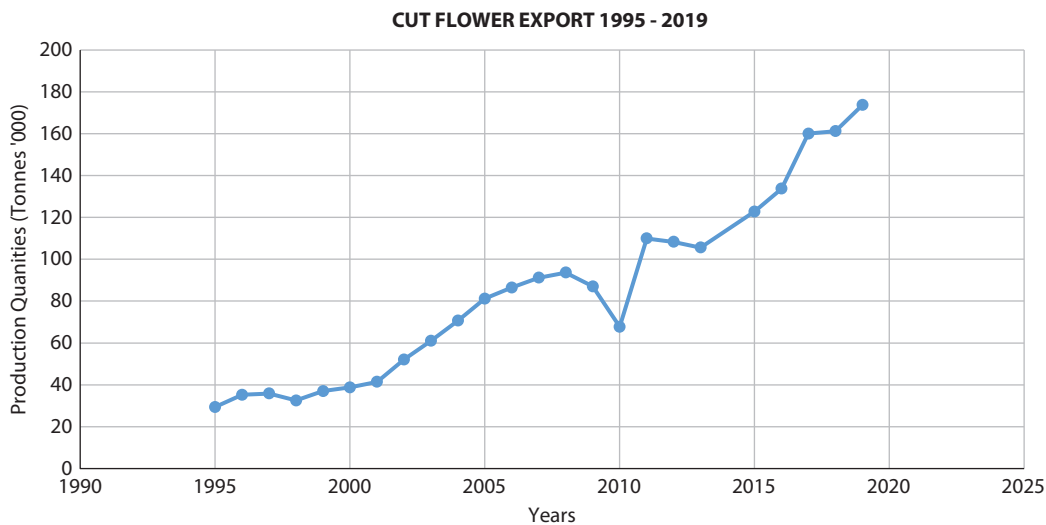


Figure 3. Production trend in cut-flower exports (1995–2019).

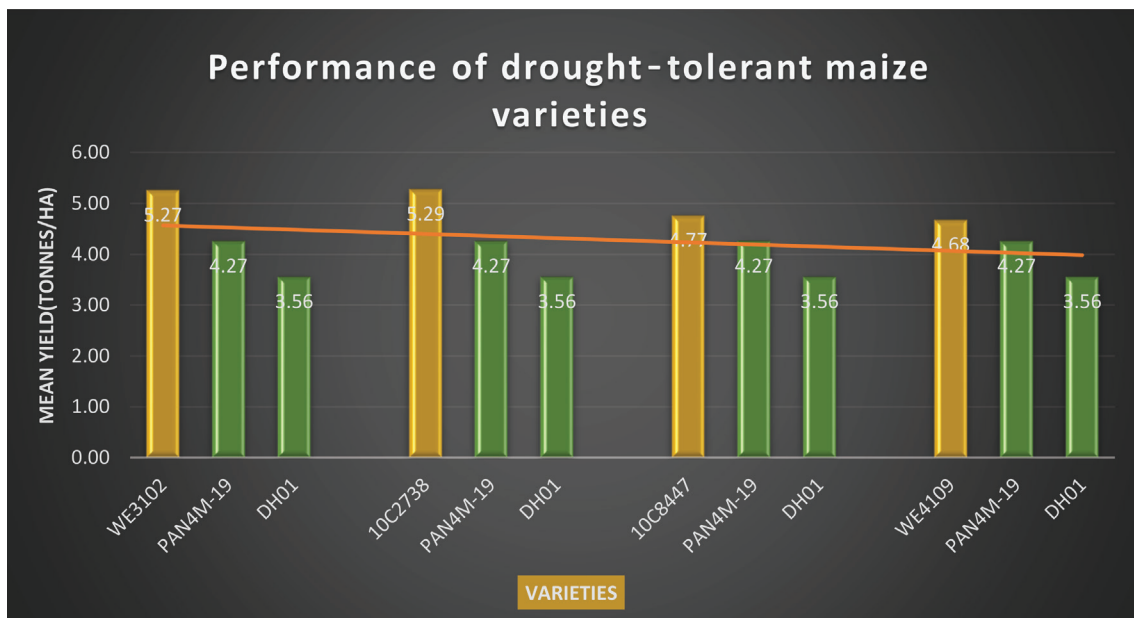
Increased breeding activities

Implementation of plant variety protection in Kenya has resulted in increased introduction of crop varieties due to enhanced variety description. International collaboration in plant variety protection through membership of UPOV has made it possible to have: harmonized test guidelines for variety description; trained personnel on development of test guidelines; and collaboration and cooperation between the breeders and the testing authority on variety description. This has helped enhance the quality of variety description and shorten testing periods, thus increasing the efficiency of the plant variety protection process.

Plant variety protection has resulted in promotion of breeding activities by farmers, as evidenced by the development of varieties of 'Bird of paradise' and Milkweed by farmer breeders.

Development and release of climate-smart and disease-tolerant varieties

Climate change and the emergence of new pests and diseases has raised the need for climate-smart and disease-tolerant varieties. Benefits accruing from PVP have motivated plant breeders to develop varieties of maize that are drought and disease tolerant. This has helped cushion farmers from the effects of adverse weather and prevalence of diseases.



	New drought-tolerant varieties
	Check (control) varieties

Figure 4. Increased production through breeding of better-yielding and drought-tolerant varieties.

Cooperation in DUS testing and exchange of DUS test reports

Kenya has signed cooperation agreements on sharing of DUS test reports with PVP authorities in the European Union, the Netherlands, Israel, New Zealand, South Africa, Japan, the Republic of Korea and Germany. For Japan and the Republic of Korea, reports are to be shared at no cost. This has facilitated accelerated protection of new varieties, resulting in quicker access to superior varieties.

CONCLUSION

Plant variety protection in Kenya has enhanced food security, employment creation and improved farmers' livelihoods by encouraging:

- Development of high-yielding climate-smart varieties of diverse crops.
- Access to elite internationally bred crop varieties.
- Breeding activities among farmers.

REFERENCES

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Government of the Republic of Kenya, Ministry of Agriculture (2010). National Seed Policy.

Seeds and Plant Varieties Act (2012). <http://kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=CAP.%20326>

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PRESENTATION MADE AT THE SEMINAR

Role of PVP in Promoting Food Security, Employment and Improved Farmers' Livelihoods in Kenya



Simon M. Maina
KEPHIS, KE
(www.kephis.org)

October 2021



Preview

1. Policy and legislative background supporting PVP in Kenya
2. Status of Plant Variety Protection in Kenya
3. Impact of Plant Variety Protection in Kenya



Introduction

- The agricultural sector is the backbone of the economy, contributing approximately **33 percent of Kenya's Gross Domestic Product (GDP)**.
- It employs more than 40 percent of the total population and **70 percent of the rural population**.
- Seed of the right variety is critical to enhancing food security and income generation through increased farm productivity.
- The need for food security and income generation has seen the development of superior varieties with relevant attributes.



Policy and legislative background supporting Plant Variety Protection in Kenya

The Constitution of Kenya

- Article 11(2) The state shall:
 - (c) **promote the intellectual property rights of the people of Kenya**
- Article 11(3) Parliament shall enact legislation to:
 - (b) recognise and protect the ownership of indigenous seeds and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya.
- Article 40(5) The State shall support, promote and protect the intellectual property rights of the people of Kenya.



The Seed Policy

- The Seed Policy (2010) has identified the **need to promote plant variety development in Kenya.**
- Specifically, the policy identified the **need to harmonize Kenyan laws with international systems that promote variety development** and international movement of seeds.
- In response to this, the Seeds and Plant Varieties Act was reviewed in 2012 to incorporate aspects of the UPOV Convention of 1991.



PVP Legislative background

- Legislation for PVP is contained in the Seeds and Plant Varieties Act, 2012 and implementing regulations .



- Kenya is a member of UPOV under the 1991 Convention and grants PBRs for all plant genera and species

UPOV



Status of Plant Variety Protection in Kenya

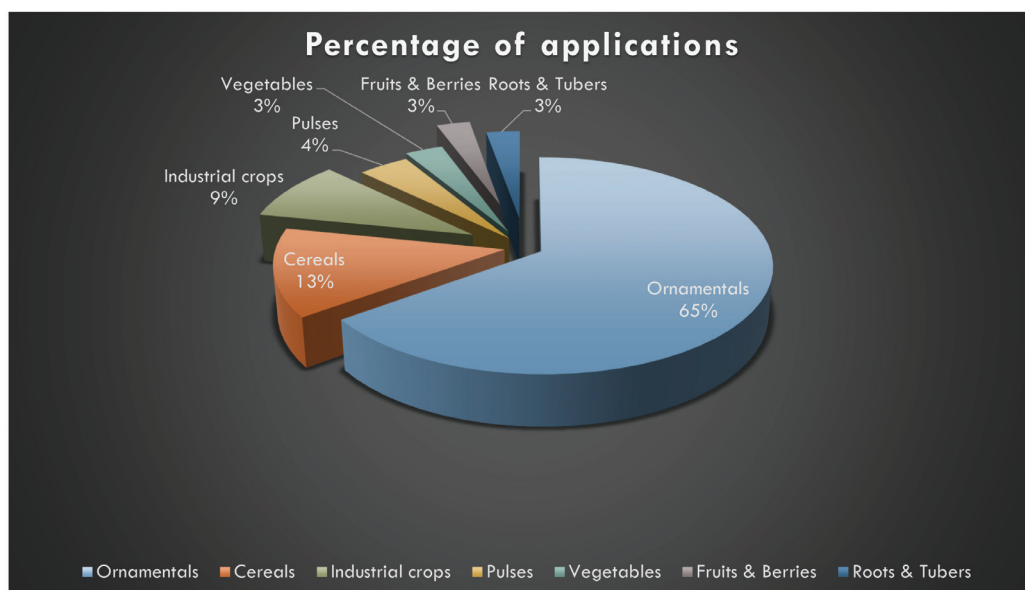
Applications for Plant Breeders' Rights

- A total of 1826 applications for PVP received by March 2021
 - Local (Kenyan) - 29%
 - Foreign - 71%
- Local applicants:
 - Public institutions - 77%
 - Private institutions - 23%
- Food crops - 36%
- Cash crops - 64%

- 127 grants were issued between 2019 - 2020

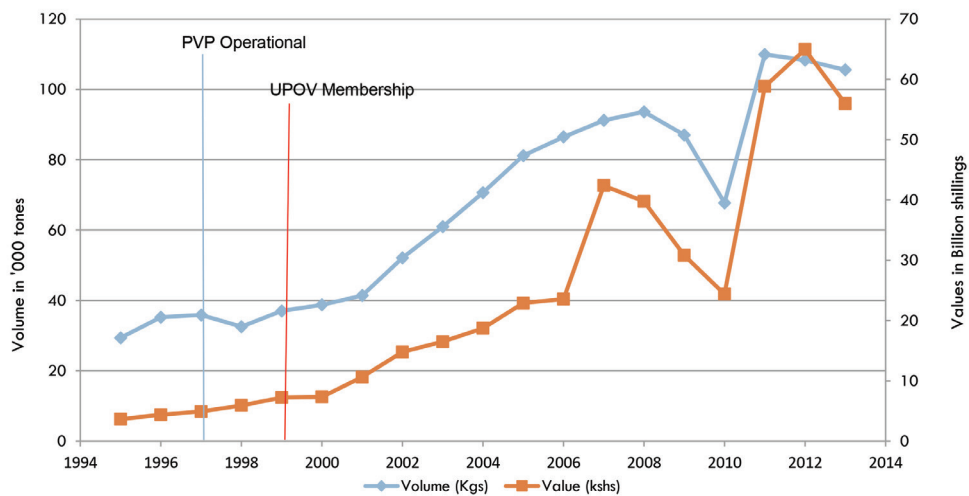


Distribution of PVP Applications in 2020



Impact of Plant Variety Protection in Kenya

Impact of PVP - The Floriculture Industry

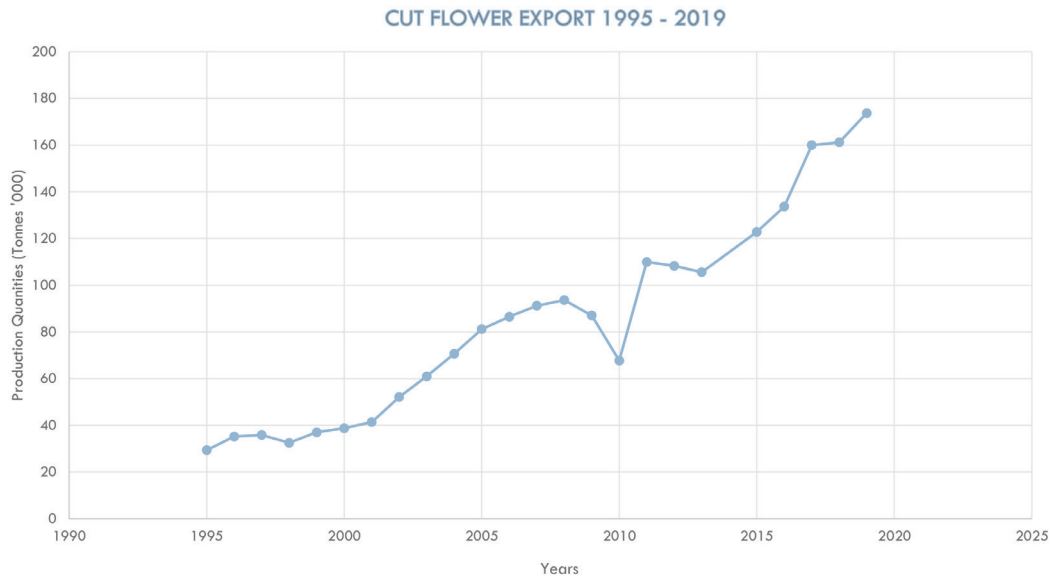


CUT FLOWER EXPORTS 1995 - 2013

Source: HCDA



Production Trend in Cut-Flower Export (1995 – 2019)



Source : HCDA
: Floral Daily



The Floriculture Industry

Wealth Creation

□ The Kenyan floriculture market was valued at **USD 861.6 million** in 2018, and;

□ **USD 1.1 billion** in 2020



The Floriculture Industry

Employment creation

- It is estimated that the floriculture industry employs over **500,000** people and impacts more than **2 million** livelihoods indirectly.



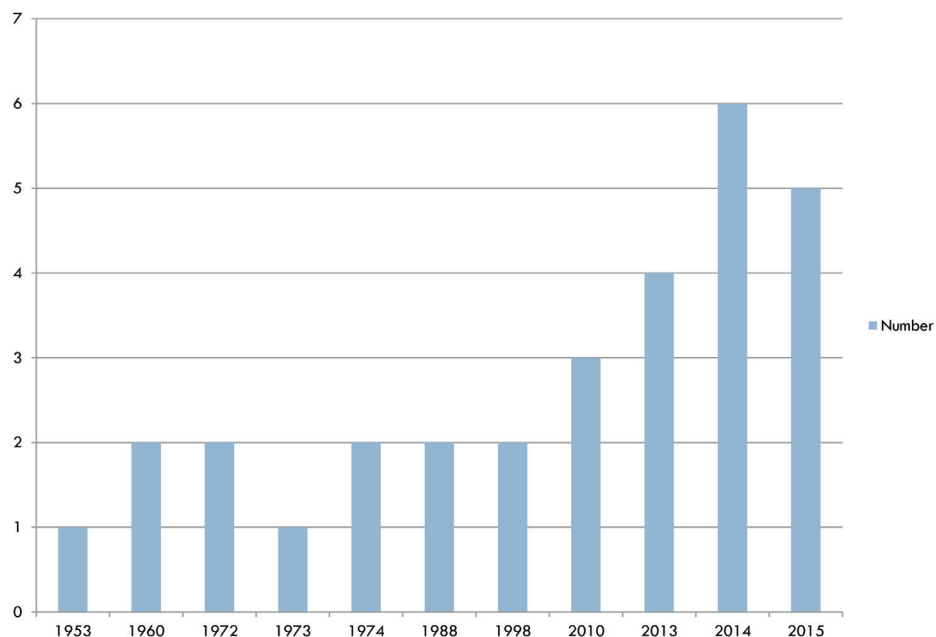
Increased Introduction of Crop Varieties: Food Security

- Increase in introduction of crop varieties due to enhanced variety description and protection:-
 - ▣ Readily available UPOV test guidelines for most of the Agricultural crops
 - ▣ Trained personnel by UPOV on development of national test guidelines
 - ▣ **Cooperation in DUS testing and Exchange of DUS test reports**

This has facilitated accelerated access to superior varieties



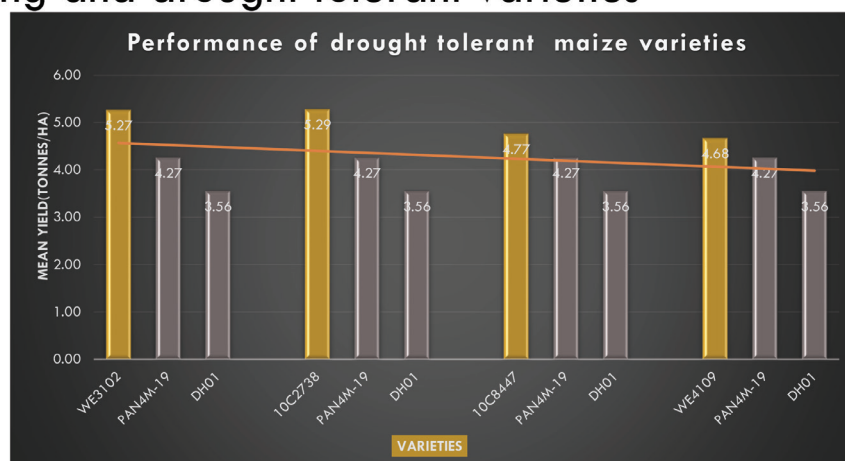
Introduction of Potato varieties



17

Development of Climate Smart Varieties: Food Security

Increased production through breeding of better yielding and drought tolerant varieties



Legend

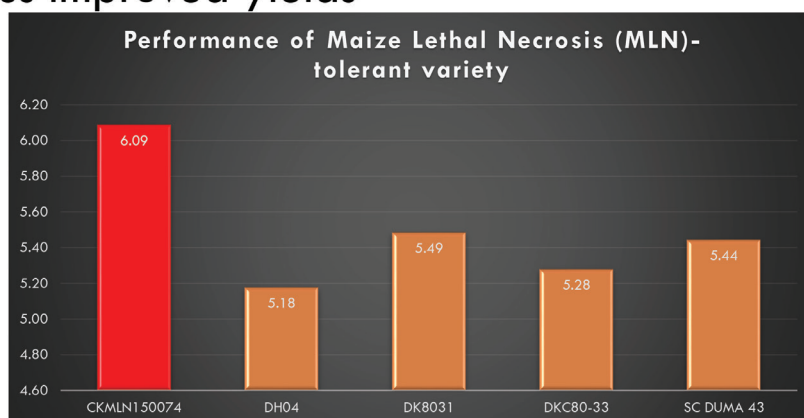


Source: KEPHIS VCU Data - 2017



Development of Disease Tolerant Varieties: Food Security

- Development and release of MLN tolerant varieties thus improved yields



Legend:  New MLN tolerant variety
 Check (control) varieties

Source: KEPHIS VCU Data;2015



Conclusion

Plant Variety Protection in Kenya has enhanced food security, employment creation and improved farmers' livelihoods by encouraging:

- Development of high yielding climate smart varieties of diverse crops.
- Access to elite internationally bred crop varieties.
- Breeding activities among farmers.



END

21

Thank You



MEXICO

PUBLIC POLICIES TO PROMOTE INNOVATIONS IN PLANT VARIETIES

MR. LEOBIGILDO CÓRDOVA TÉLLEZ, Head, National Service for Seed Inspection and Certification (SNICS), Secretariat of Agriculture and Rural Development (AGRICULTURA)

I PUBLIC RESEARCH BACKGROUND IN MEXICO

To date, at least three developmental periods related to plant breeding in Mexico can be distinguished. Before the 1940s, the breeding was mostly done by farmers, who would select the best native seed from their farms. An important issue in this period was the establishment of the first Agricultural Experimental Unit located in San Jacinto, Mexico. Nowadays, there is the well-known National Agriculture School, “Universidad Autónoma Chapingo”



Figure 1. Evolution of public research in Mexico, 1907–1961.

Between 1940 and 1980, the government had a high level of participation in the development of new varieties. Several experimental units were established, together with a collaboration agreement between the Ministry of Agriculture in Mexico and the Rockefeller Foundation, which within a few years led to the release of new varieties.

In 1961, the first Seed Law was published, along with the establishment of several public institutions such as the National Institute of Agricultural Research (INIFAP), National Seed Producer Industry, National Register of Plant Varieties, Plant Variety Rating Committee, and National Seed Inspection and Certification Service.

The Seed Law published in 1961 provided plant variety protection for a period of 25 years. More than a thousand plant varieties of 33 crops were registered under this Seed Law. Nevertheless, those plant varieties were not described as they should be, and we only conserved the registration in a national listing registration.

II VARIETY GENERATION DYNAMICS IN MEXICO

The Mexican Law of Plant Varieties was established in 1996, and in 1997 Mexico became a UPOV member.

Since then, the breeders have had three options with the new generated varieties:

1. PBR or PVP registration
2. National Listing System registration
3. No registration

To date, 4,804 varieties from 130 species have been registered under the two options offered: 1,625 varieties are registered under the PVP Law, from 26 counties; 998 varieties are registered under both options and 2,181 varieties are registered only under the National Listing System, without breeding rights.

The most important crops in Mexico under breeders' rights are maize, sorghum, and rose.

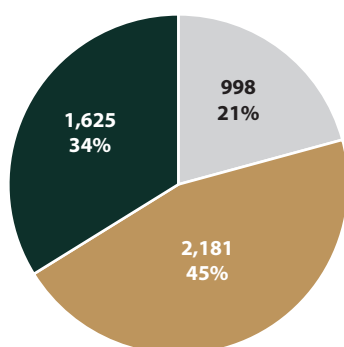


Figure 2. Mexico. Plant Varieties Register (PBR and NLI).

III PVP SYSTEM IN MEXICAN AGRICULTURE

In terms of the registration dynamics under the PVP system in general, there has been an increase in registrations since the beginning of 2002 but there is a lot of variation.

We have identified some factors related to this variation; their effect is related to the source of investment in the generation of the new variety, which is either public investment or private investment.

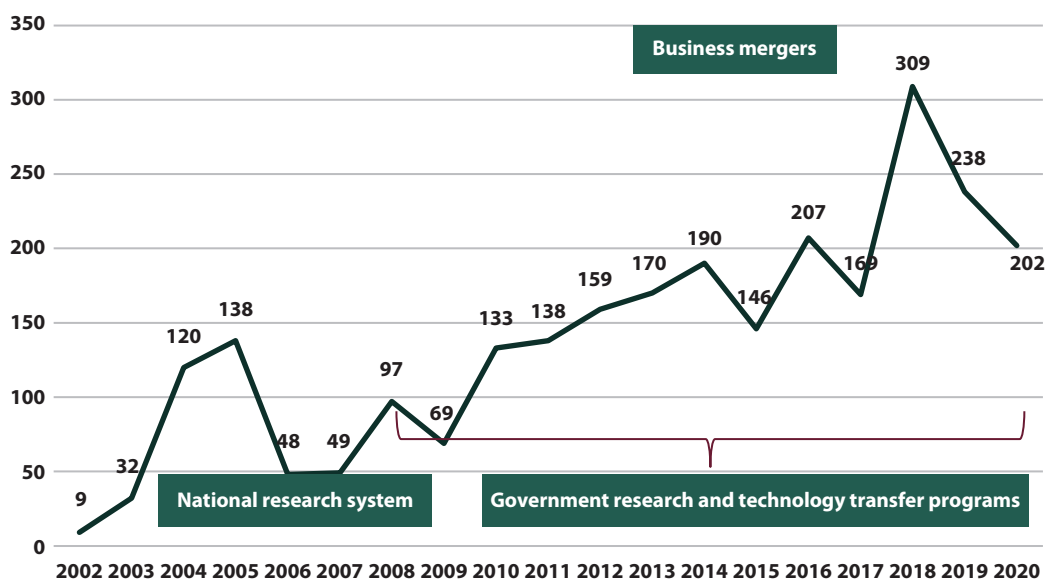


Figure 3. Mexico, titles issued (PBR).

For those who receive public funding, high availability of funding recognition in the registration of the generation of new varieties would lead to a high number of varieties; however, public funding has been decreasing, the breeder age is increasing and there is no program to contract new breeders.

On the other hand, for those who work with private funding, the number of newly registered varieties has been increasing, but they are looking for better application of the PVP rights.

The low investment of public funding could have a negative impact because this is the main source for generating varieties of important crops for food and agriculture in Mexico, such as maize, dry-bean, wheat, and rice, in particular the latter three crops; in these crops there is very low private sector investment in the development of new varieties.

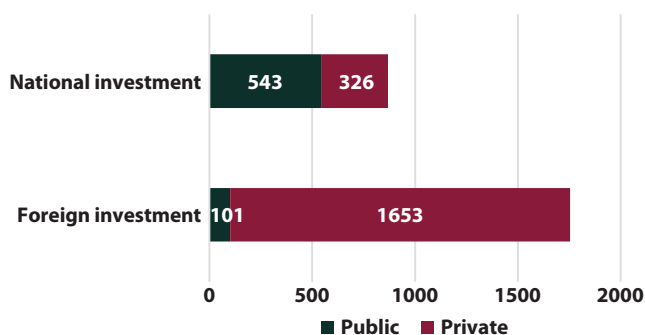


Figure 4. Titles issued by the origin of investment.

The varieties obtained by the public sector are the main source of access to new varieties for about 600 seed companies (farmers' associations, small seed family companies, among others) which do not have a breeding program.

The private sector mainly invests in crops that allow them the insurance of seed selling and as a consequence to recover their investment, such as maize hybrids.

Table 1. Mexico. Titles issued of basic crops, by their origin of investment.

Crop	National investment		Foreign investment		Total
	Public	Private	Public	Private	
Rice	20			1	21
Bean	44	1		8	53
Maize	116	183		261	560
Wheat	54	14		1	69

There is a positive effect of the generation of new varieties on maize, the most important crop in Mexico. The national average has increased year by year. In Figure 5, the yield (above 4 t/ha) is low because the average considers the entire surface area cultivated with native seed varieties. The average considering only improved varieties is about 8 t/ha, and a lot of farmers can reach yields of about 18 t/ha.

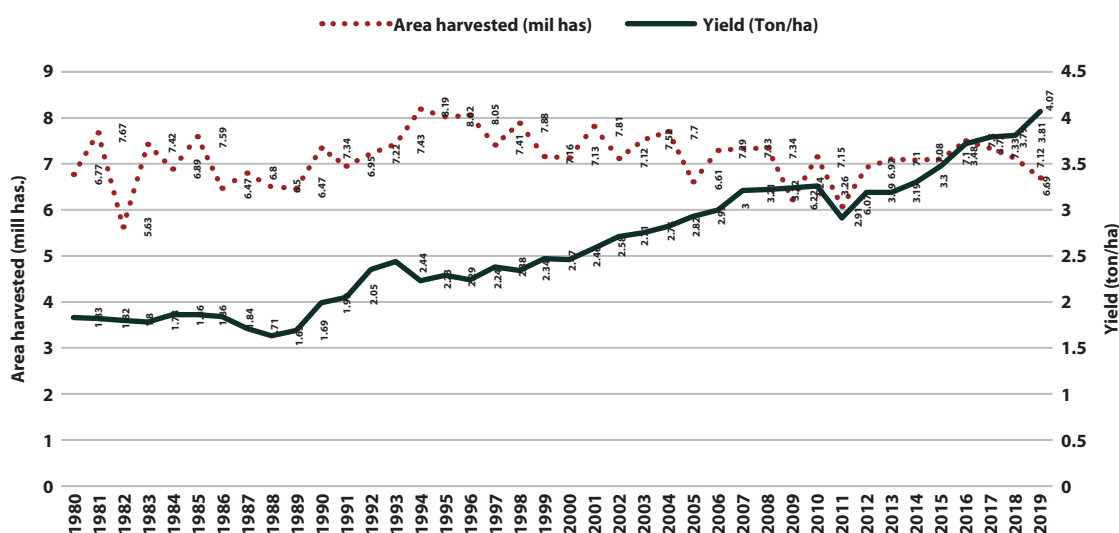


Figure 5. Mexico. Titles issued of basic crops, by their origin of investment.

IV ACTIONS TO PROMOTE PLANT BREEDING AND QUALITY SEEDS

To overcome the negative effect of the identified factors that restrict the development of new varieties, several public policies have been developed.

First, a National Seed Program (2020–2024) has been published,¹ which on the one hand states objectives to increase the development of new varieties and produce more certified seed for those farmers who use improved varieties. On the other hand, it states objectives to help farmers who self-save seed to plant the following season (small farmers, self-consumption-farmers).

Subsistence farmers are included for the first time

Second, a National Seed Policy was published in 2020,² with the main objective of guaranteeing the conservation of plant diversity, generation of new varieties, production and commercialization of seeds of improved varieties, and contributing to food security. 41 specific actions and 11 strategies are contained in the following four main points:

1. Structure the management of the plant genetic stock, as well as the generation and transfer of innovations of plant varieties.
2. Strengthen the multiplication and production of quality seed.
3. Promote the trade of qualified seed produced in Mexico and the imported seed.
4. Restructure procedures for quality management in the production and trade of seeds and strengthen the regulations of the seed sector.

Third, a considerable number of varieties have been obtained by Mexican public institutions; however, a very low percentage is being used by seed companies because of the lack of clear procedures. Therefore, a license mechanism agreement between seed companies (national seed industry) and public institutions is being implemented. It allows the institution to obtain some income to be invested in supporting the breeding programs and to generate new varieties according to actual and future needs.

¹The National Seed Program can be consulted on the website: http://www.dof.gob.mx/nota_detalle.php?codigo=5608920&fecha=28%2F12%2F2020

²<https://www.gob.mx/snics/acciones-y-programas/politica-nacional-de-semillas#:~:text=El%20objetivo%20fundamental%20de%20la,bajo%20un%20enfoque%20de%20sustentabilidad.>

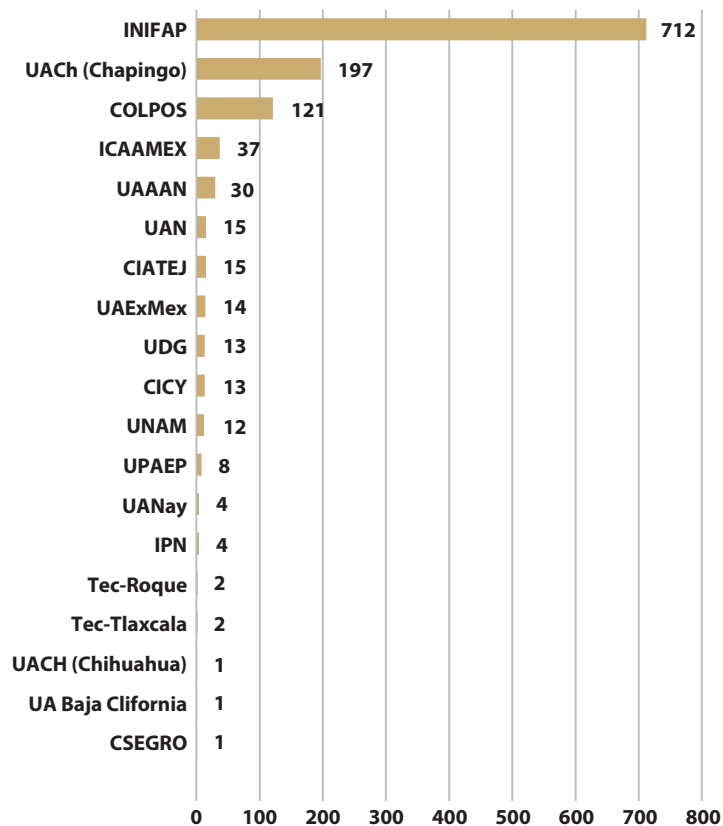


Figure 6. Mexican public institutions with improved varieties.

Fourth, since each crop has its own particular dynamics and problems, specific seed supply programs are under development and implementation, such as maize, beans,³ rice, wheat, cotton⁴, cocoa, and coffee.

The main strategies in these programs can be summarized as follows:

1. Increase the planted surface with certified seed.
2. Transfer of new varieties already released.
3. National plan breeding program to generate new varieties to overcome actual and future farmers' challenges.

To implement these strategies, we are using a model that involves the participation of the social-public-private sectors.

³https://www.gob.mx/cms/uploads/attachment/file/632082/Programas_de_abasto_Frijol.pdf

⁴https://www.gob.mx/cms/uploads/attachment/file/632083/Programa_de_abasto_de_algodo_n.pdf



Figure 7. Mexican seed supply programs.

Fifth, we are working on strategies to reduce the use of varieties under the PVP system without the authorization of the owner and are working to adopt the 1991 UPOV Act.

Mexican agriculture faces a great challenge, but we are working to overcome it.

PRESENTATION MADE AT THE SEMINAR

Mexico: Public policies to promote innovations in plant varieties



Content

1. Public Research background in Mexico.
2. Varieties generation dynamics in Mexico.
3. PVP system on Mexican agriculture.
4. Actions to promote plant breeding and quality seeds.



1. Public Research background in Mexico



Before to 1960

For a long time, the breeding of native seeds were used empirical methods until the creation of the Public Research Institutions.



- 1907 • Beginnings of agriculture research in Mexico (First Agricultural experiment station located in San Jacinto).
- 1908 • Three experimental stations were established at Tabasco, San Luis Potosí and Oaxaca.
- 1935 • 15 experimental agricultural stations and several agricultural fields located in different states of the country (improvement of Cereal varieties).
- 1940 • Experimental field General Direction was created, promoted by the Agriculture ministry.
- 1943 • Arises the Specialized Studies Office- Years later it become at CIMMYT
- 1947 • The Agricultural Research Institute (IIA) and National Corn Commission (new varieties of maize) were created.
- 1961 • The first Seed Law was established and with it, the creation of SNICS, INIA (INIFAP), Plant Variety Registry, Plant Variety Qualifying Committee and PRONASE

1. Public Research background in Mexico



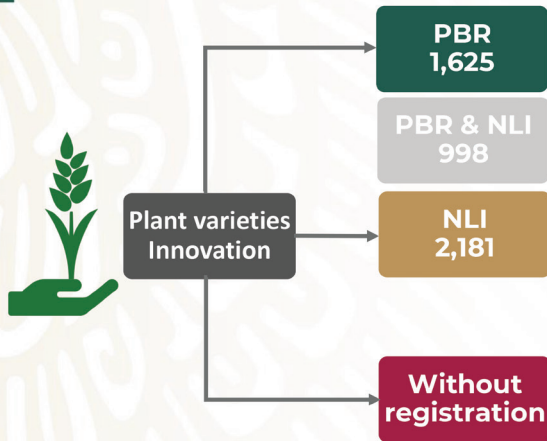
1960-1980 in México

- » Since 1980, the Government reduces its participation and the Private sector begins to boost the Research Institutions
- » The Seeds Law (1961), recognized the intellectual property of the Breeders for up to 25 years.
- » More than 1,000 varieties are inscribe in the National Registry of Plant Varieties.

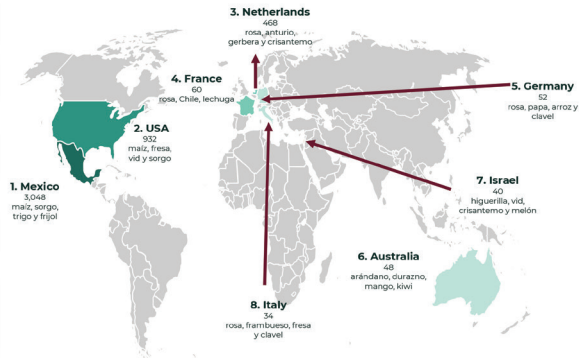
Trigo.			
Plant.	Nombre Variedad	Propietario	Usufructuario
Tr-2170	Tronca 870	Inia	Pronase
Tr-2181	Tronca 870	Inia	Pronase
Tr-2176	Tronca 870	Inia	Pronase
Tr-2178	Tronca 870	Inia	Pronase
Tr-2171	Tronca 871	Inia	Pronase
Tr-2171	Tronca 871	Inia	Pronase
Tr-2171	Tronca 871	Inia	Pronase

2. Varieties generation dynamics in Mexico.

4,804 registered varieties (130 crops)



PBR: Plant Breeder's Right
NLI: National Listing (CNVV)

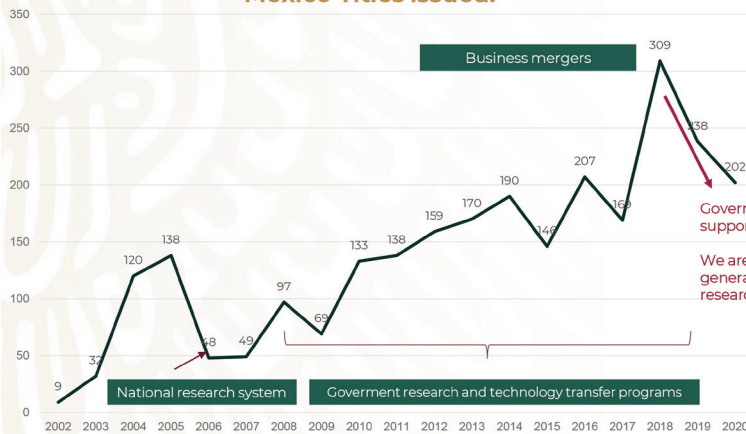


26 countries

3. PVP system on Mexican agriculture

Since the implementation of the PVP system, 2 623 Titles have been issued

Mexico Titles issued.



- ▶ 1996 domestic law (LFVV)
- ▶ 1997 Mexico became a UPOV member
- ▶ 2002 first Title issued

There are some factors that influence the generation of plant varieties

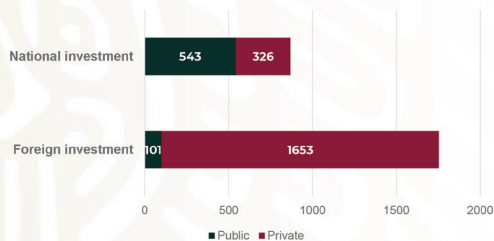
Government reduces its supports to Public Research

We are not having generational replacement researchers

3. PVP system on Mexican agriculture



Titles issued by the origin of investment



Titles issued of basic crops, by their origin of investment.

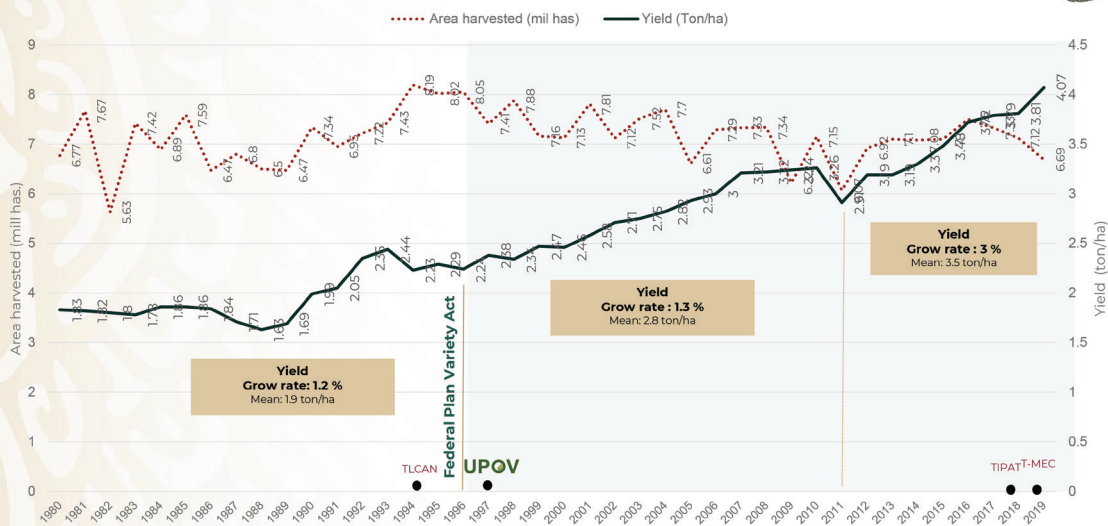
Crop	National investment		Foreign investment		Total
	Public	Private	Public	Private	
Rice	20			1	21
Bean	44	1		8	53
Maize	116	183		261	560
Wheat	54	14		1	69

- » The Public Research Institutions are an important source of plant innovations,
- » Public varieties can be used by around 600 small seed companies

9 out of 10 varieties of rice are generated by Public Research Institutions. Bean and wheat, 8 out of 10.

3. PVP system on Mexican agriculture

Mexico: Dynamics of corn productivity (1980-2019).



4. Actions to promote plant breeding and quality seeds



1. National Seeds Program (2018-2024)

Objectives:



- » Increase the national production of quality seed of improved varieties that contributes to increasing productivity and food self-sufficiency,
- » Implement local native seeds production systems according to the needs of each region,
- » Strengthen seed research to encourage the development and use of new improved varieties that allow sustainable production and resilience to natural factors,
- » Strengthen the state leadership in the production and use of quality seeds and build a new public management at the service of the field with honesty, ethics, transparency, austerly

4. Actions to promote plant breeding and quality seeds



2. National seed policy

Defines the axes, strategies, and actions to be implemented so that the Mexican farmers has the best seeds.

Axes



1. Structure the management of the plant genetic stock, as well as the generation and transfer of innovations of plant varieties,
2. Strengthen the multiplication and production of quality seed,
3. Promote the trade of qualified seed, produced in Mexico and that of import,
4. Restructure procedures for quality management in the production and trade of seeds and strengthen the regulations of the seed sector.

Subsistence farmers are included for the first time

4. Actions to promote plant breeding and quality seeds



3. Promote the use and generation of public varieties

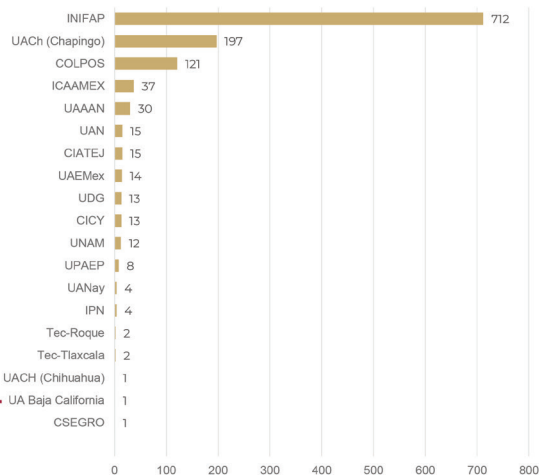


» Take advantage of public varieties through licensing schemes,

» Promote the generation of varieties according to the needs.

46 public research institutes with improvement programs and 253 active researchers

Public institutions with improved varieties



4. Actions to promote plant breeding and quality seeds



4. Seed supply programs



Cotton:

- » Social-public-private partnership
- » Short term: quality seed for farmers
- » Medium term: generation of varieties according to the needs



Beans:

- » Seeds refreshment
- » Transfer of new varieties
- » generation of varieties according to the needs
- » The goal is to increase from 5% to 50% of the area sown with certified seed by 2024.

In construction: Rice and Wheat

¡Thank you!

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NORWAY

THE IMPORTANCE OF PLANT BREEDING FOR FOOD SECURITY: RECENT POLICY DEVELOPMENT IN NORWAY

MS. SVANHILD-ISABELLE BATTÅ TORHEIM, Senior Advisor,
Department of Forest and Natural Resource Policy,
Ministry of Agriculture and Food

1 INTRODUCTION

Plant breeding is an activity needed for ever – to improve crops to meet nutritious needs, adapt production to climate change, suitable for different agroecological and cultural conditions. Norway is pleased to present some recent policy developments illustrating the importance of plant breeding for food security. We will share information about (1) the national strategy on genetic resources for food and agriculture (adopted in 2019); (2) Norwegian submissions to the Inventory on Farmers' Rights in the International Treaty (in 2019); (3) how plant breeding is included in the government's White paper, including Norway's action plan to implement the Sustainable Development Goals (June 2021); (4) the Arctic Call to Action launched at Svalbard Global Seed Vault (February 2020); (5) the government's action plan on sustainable food systems in the context of Norwegian foreign and development policy (2019–2023); and (6) finally, the seed security initiative presented to the United Nation Food System Summit in September 2021.

2 SECURING THE GENE POOL FOR FUTURE AGRICULTURE AND FOOD PRODUCTION

Access to genetic resources is a prerequisite for plant breeding. Without access there is no breeding; hence the importance of breeders' exemption in plant variety protection (PVP). In order to have access to genetic resources, these resources need to be managed well. In December 2019, the Ministry of Agriculture and Food adopted a national strategy on genetic resources for food and agriculture – *Securing the Gene Pool for Future Agriculture and Food Production*.¹

Genetic diversity is the foundation of agriculture. The overall goal of this national strategy is to secure the gene pool for future agriculture and food production. The implementation of the strategy is Norway's main instrument to achieve the United Nations Sustainable Development Goal (UN SDG) Target 2.5 on the maintenance of genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species.

No country is self-sufficient when it comes to genetic resources. Norway plays an active role in international cooperation and is committed to the conservation of its unique genetic resources. Important measures on how to achieve this overall goal of the strategy include:

- Encouraging the development of climate-resilient crops, livestock, and forest trees that are adapted to the growing conditions and farming systems in all parts of the country.

¹Securing the Gene Pool for Future Agriculture and Food Production – <https://www.regjeringen.no/en/aktuelt/securing-the-gene-pool-for-future-agriculture-and-food-production/id2862850/>

- Ensuring that farmers have easy access to genetic resources and can continue participating in decision-making processes. Norway's farmers should continue to be able to use farm-saved seeds and their own live animals in their production.
- Continuing participation in international cooperation on genetic resources, with an emphasis on access and benefit sharing and Farmers' Rights.
- Increasing the share of major food and forage crops whose seeds are stored in the Svalbard Global Seed Vault.

Norway has taken on a special global responsibility with the Svalbard Global Seed Vault, which provides backup storage for seeds from gene banks across the globe. The overall responsibility for the Seed Vault rests with the government, under the Norwegian Ministry of Agriculture and Food. Daily operations are overseen by the Nordic Genetic Resource Centre (NordGen) under an agreement between the Ministry, NordGen and the Crop Trust. Currently, 1,081,026 seed samples from 87 gene banks are stored in the Seed Vault.²

3 OPTIONS TO ENHANCE, PROMOTE AND GUIDE THE IMPLEMENTATION OF FARMERS' RIGHTS

Farmers' Rights, as recognised in Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture, is a priority in Norway's international cooperation on genetic resources. Norway co-organised a global consultation on Farmers' Rights together with Indonesia in 2016. Based on one of the recommendations from this consultation, the seventh session of the Governing Body of the International Treaty established an Ad Hoc Technical Expert Group (AHTEG) on Farmers' Rights. Together with India, the AHTEG is co-chaired by Norway. The mandate of the AHTEG is twofold:

- *Produce an inventory of national measures that may be adopted, best practices and lessons learned from the realization of Farmers' Rights, as set out in Article 9 of the International Treaty; and*
- *Based on the inventory, develop options for encouraging, guiding and promoting the realization of Farmers' Rights as set out in Article 9 of the International Treaty.*

²Svalbard Global Seed Vault – A site about seeds! – <https://www.seedvault.no/>

The inventory was welcomed by the eighth session of the Governing Body and is now available online.³ Norway has submitted several national measures on the realisation on Farmers' Rights that are included in the Inventory. Among them is the submission titled *Balancing PVP and Farmers' Rights*.⁴ Intellectual property rights protecting plant varieties are relevant regarding Farmers' Rights to save, use, exchange and sell farm-saved seeds. Norway became a member of UPOV in 1993, based on the 1978 Act of the UPOV Convention. Even though the 1991 Act was adopted by many other countries at that time, Norway chose to adhere to the 1978 Act. In 2004, the government proposed changes to the Plant Breeders' Rights Act and to join the 1991 Act of the UPOV Convention. However, this proposal spurred public debate. After the election in 2005, the new government withdrew the proposed changes in the PVP legislation on the grounds that they limited Farmers' Rights. At the same time, the breeding industry was promised to receive stronger government support for the development of varieties suitable for Norwegian conditions and adapted to climate change. Based on this agreement, farmers in Norway could continue to save and use farm-saved seed and propagate material of protected varieties without paying any remuneration to the holder of the plant variety protection right.

At its last session, in August 2021, the AHTEG finalised its discussion on options for encouraging, guiding and promoting the realisation of Farmers' Rights. Substantive time was spent on legal measures such as the relationship between Farmers' Rights and IPR. Those options related to legal measures will be presented to the next session of the Governing Body as co-chairs' proposal.

4 WHITE PAPER (2021): GOALS WITH A PURPOSE. NATIONAL ACTION PLAN TO IMPLEMENT THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The SDGs are global goals guiding domestic policies in all countries. Embedding plant breeding in such overall policy frameworks contributes to increased awareness raising of the importance of plant breeding. In June 2021, the government launched a White paper that constitutes the government's national action plan to implement the SDGs.⁵ Plant breeding is particularly

³Inventory on FRs | International Treaty on Plant Genetic Resources for Food and Agriculture | Food and Agriculture Organization of the United Nations – <https://www.fao.org/plant-treaty/areas-of-work/farmers-rights/inventory-on-frs/en/>

⁴Submission – Balancing PVP and Farmers' Rights – Norway – <http://www.fao.org/3/ca8165en/ca8165en.pdf>

⁵Regjeringen legger frem en stortingsmelding om bærekraftsmålene –<https://www.regjeringen.no/no/aktuelt/handlingsplan-for-barekraftsmalene/id2863337/>

relevant to achieve SDG Target 2 on ending hunger as well as SDG Target 15 on life on land. One of the follow-up activities is: *Strengthen climate adaptation of food production by conserving genetic diversity, promote plant and animal breeding and protect agricultural land.*

5 ARCTIC CALL TO ACTION ON FOOD SECURITY AND CLIMATE CHANGE

Members of the UN Secretary-General's Advocacy Group for the Sustainable Development Goals, under the leadership of the Prime Minister of Norway at the time, Erna Solberg, and President Nana Akufo-Addo of Ghana, urged all governments to step up their efforts to eradicate hunger and maintain genetic diversity.⁶ Climate change is challenging the functions of the food systems. Transforming our food systems offers a pathway to improved resilience of ecosystems, reduced vulnerability of rural populations to climate impacts, and enhanced contributions to climate change mitigation. Genetic diversity is essential for ensuring sustainable agriculture. By making use of this diversity, we can develop crops that are more heat-, drought- and flood-resistant. At the occasion of a major seed deposit to the Svalbard Global Seed Vault, the Advocacy Group of the SDGs launched the *Arctic Call to Action for Food Security and Climate Change*.

6 FOOD, PEOPLE AND THE ENVIRONMENT

In 2019, seven ministers from five ministries launched the government's action plan on sustainable food systems in the context of Norwegian foreign and development policy.⁷

Through this action plan, the government said it will intensify its efforts to increase sustainable food production, improve nutrition, enhance job and value creation, and promote capacity building and good governance. The main target group of the action plan is small-scale farmers and fishermen, with a particular focus on the least developed countries and sub-Saharan Africa. The action plan recognises that greater crop diversity and better agronomic knowledge can make crops and livestock more resilient to environmental and climate change, diseases and economic fluctuations. This in turn can lead to a wider choice of food in the market and better nutrition.

⁶Arctic Call to Action for Food Security and Climate Change |International Treaty on Plant Genetic Resources for Food and Agriculture – <https://www.fao.org/plant-treaty/news/news-detail/en/c/1264244/>

⁷Food, People and the Environment – https://www.regjeringen.no/globalassets/departementene/ud/dokumenter/planer/sustainablefood_actionplan.pdf

From the action plan:

Global food production is based on a steadily decreasing number of crop varieties and livestock breeds. Introducing climate-resilient seed systems and enhancing species and genetic diversity are important for adapting agriculture to climate change. More needs to be done to ensure that good quality seeds are available to the poorest farmers. This can be achieved by breeding new varieties and promoting local seed production. Norway is contributing to the conservation and sustainable use of genetic diversity, for example through support for community seed banks, the establishment and operation of the Svalbard Global Seed Vault, as well as active participation in relevant international forums.

Over the next five years, the action plan sets out eight targets to be implemented by action points that the Norwegian government will work to achieve. One of the targets is **Biodiversity in food production has increased**, which is intended to be achieved by:

- Strengthening the management of genetic diversity of crops, livestock and fish at the local, national and global level.
- Increasing small-scale producers' knowledge about plant varieties and animal breeds and providing access to a greater variety of both.
- Strengthening plant and animal breeding at both the local and national level.

The importance of plant breeding and the accessibility of locally adapted varieties is also recognised in the government's strategy on climate adaptation and hunger prevention.⁸

7 SEED SECURITY AT THE UN FOOD SYSTEMS SUMMIT

During the preparatory process leading to the UN Secretary-General's Food Systems Summit in September 2021, Norway shared a proposal on seed security. Norway's game-changing idea, *Putting farmers' and indigenous peoples' access to crop diversity first, in seed policy and practice for seed security*, was a collaborative effort by Norwegian government agencies, research institutions and civil society organisations.⁹ The proposal is listed as a solution cluster on the UN Food Systems Summit website.

⁸https://www.regjeringen.no/globalassets/departementene/ud/dokumenter/planer/strategi_klimatilpasning_ny.pdf

⁹Seed security at the UN Food Systems Summit – <https://www.regjeringen.no/en/aktuelt/seed-security-at-the-un-food-systems-summit/id2865664/>

Briefly stated, the starting point of the idea is that smallholders are key to food security in the Global South by producing most of the domestically consumed food. The diversity of plant genetic resources for food and agriculture is crucial for farmers' ability to adapt their food production to the effects of climate change and ensure access to safe and nutritious food. As custodians of the bulk of this diversity, the millions of smallholders in the Global South are key players in the seed and food systems and principal managers of the genetic resources that will be critical for the development of climate-adaptive agriculture. At the same time many of them face seed insecurity – they do not have access to varieties adapted to their agroecological, cultural and socio-economic context.

However, relevant policies, funding and institutions at the national and international levels of today are unable to meet the needs of the majority of the farmers in the Global South with regard to supporting and enhancing the potentials of their local seed systems. The legal structures and policies have been developed to accommodate and promote the formal seed sector, thereby largely neglecting the fundamental importance of farmers' seed systems for food security and the maintenance of genetic diversity that is the foundation of all food production. This proposal calls for a fundamental re-think of how seed system development is supported globally and is aimed at establishing the structures and support required for farmers' seed systems to develop their potentials to meet food security. A long overdue system change is at the core of this proposal, as this is fundamental to changing the game.

8 CONCLUSION

Plant breeding is crucial to food security. Plant breeding is stimulated by the possibility to apply PVP, but PVP is not a sufficient incentive to ensure plant breeding of crops adapted to various agroeconomic settings in small markets. Access to genetic resources is a vital prerequisite for any breeding; thus sustainable management of those resources needs to be in place. Furthermore, policies on PVP need to be implemented in a mutually supportive manner with other policy objectives, such as the realisation of Farmers' Rights. Finally, in order to increase awareness of the importance of plant breeding and crop improvement and thereby steady political and financial support, it is important to incorporate plant breeding into policies on broader issues such as food systems and the achievements of the Sustainable Development Goals.

PRESENTATION MADE AT THE SEMINAR



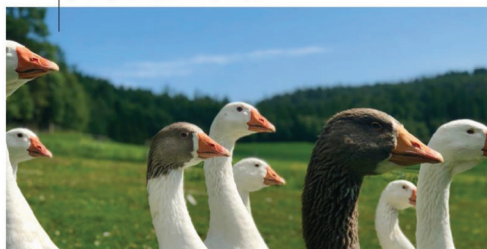
The importance of plant breeding to food security. Recent policy development in Norway

Bell Batta Torheim,
Senior Advisor,
Ministry of Agriculture and Food,
Norway



National strategy (2019): Securing the Gene Pool for Future Agriculture and Food Production

- climate-resilient crops adapted to the growing conditions in all parts of the country.
- farmers able to use farm-saved seeds
- international cooperation: access and benefit sharing and Farmers' Rights.
- Svalbard Global Seed Vault.



Options to enhance, promote and guide the implementation of Farmers' Rights

- Expert Group on Farmers' Rights set up by the Governing Body of the International Treaty.
- Norway has shared several experiences, including balancing farmers' rights and plant breeders' rights by keeping UPOV 1978.



First meeting of the Expert Group. Co-chaired by India and Norway.

White paper (2021): Goals with a purpose. National Action Plan to implement the SDGs

Goal 2- Zero Hunger and Goal 15 - Life on Land:

Strengthen climate adaptation of food production by conserving genetic diversity, promote plant and animal breeding and protect agricultural land.



UN Secretary General's Advocacy Group for the Sustainable Development Goals
Arctic Call to Action on Food Security and Climate Change (2020)



Arctic Call to Action on Food Security and Climate Change

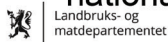


Food,
People and
the Environment

The Norwegian Government's
action plan on
sustainable food systems
in the context of foreign and
development policies,
2019–2023

Biodiversity in food production has increased

- Strengthen the management of genetic diversity of crops, livestock and fish at local, national and global level.
- Increase small-scale producers' knowledge about plant varieties and animal breeds, and provide access to a greater variety of both.
- Strengthen plant and animal breeding at both local and national level.



#FoodSystemsNorway

Strengthen the management of genetic diversity of crops, livestock and fish at local, national and global level.

Increase small-scale producers' knowledge about plant varieties and animal breeds, and provide access to a greater variety of both.

Strengthen plant and animal breeding at both local and national level.

Seed security at the UN Food System Summit



Solution Cluster 1.1.2b

Put farmers' and Indigenous Peoples' access to crop diversity first in seed policy and practice

The diversity of plant genetic resources for food and agriculture is crucial for farmers' ability to adapt their food production to the effects of climate change and ensure access to safe and nutritious food. This proposal calls for a fundamental re-think of how seed system development is supported globally. Our proposal is to ensure and promote – through legislation, seed policies, and action – farmers' access to a diversity of well-adapted varieties of crops that meet agroecological and nutritional needs and preferences. Farmers' seed systems are key to providing farmers with access to both local varieties developed over millennia of farmer selection and modern varieties developed with modern plant breeding. We call for a bottom-up demand-driven approach to seed security to complement the currently dominant top-down supply-side approach, thereby supporting farmers' agency and recognising farmers' seed systems contribution to global food security.



8

Thank you for your attention
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PERU

STRATEGIES FOR PROMOTING THE PROTECTION OF PLANT VARIETIES IN PERU

MR. MANUEL CASTRO CALDERÓN, Director, Directorate of Inventions and New Technologies, National Institute for Defense of Competition and Protection of Intellectual Property (INDECOPI)

1 LEGAL AND INSTITUTIONAL FRAMEWORK

In Peru, two national bodies are concerned with the protection of plant varieties:

- (a) Through its Inventions and New Technologies Department, the National Institute for the Defense of Competition and Protection of Intellectual Property (INDECOPI) is responsible in the first instance for carrying out the administrative functions set forth in Decision No. 345. It also assesses novelty and denomination criteria for the protection of new plant varieties.
- (b) The National Institute for Agricultural Innovation (INIA), through its Agricultural Innovation Management Department, is responsible for the technical aspects of the procedure. It also assesses the distinctness, uniformity and stability requirements for the protection of new plant varieties.

The relevant legislation dates back to 1993, with the adoption of Decision No. 345, under which the Common Regime for the Protection of Plant Breeders' Rights was established. With a view to regulating the provisions of the Decision, the Regulations for the Protection of the Rights of Breeders of New Varieties of Plants were first issued under Supreme Decree No. 008-96-ITINCI in 1996, followed in 2000 by administrative decisions No. 43-2000-INIA (fees), No. 046-2000-INIA (storage and handling of live samples) and No. 047-2000-INIA (technical evaluation) on INIA procedures.

Penalties for infringements of the rights of breeders of protected plant varieties are set forth under Act No. 28126, which was passed in 2003.

After accession by Peru to the 1991 Act of the UPOV Convention in 2011, new Regulations for the Protection of the Rights of Breeders of New Varieties of Plants were issued under Supreme Decree No. 035-2011-PCM.

Lastly, work on drafting the national intellectual property (IP) policy began in 2020. Given the IP focus of the regime for plant variety protection, it has been included in the process.

2 THE IMPORTANCE OF THE SYSTEM FOR PROTECTING PLANT VARIETIES

The system for protecting plant varieties is important for a variety of reasons, including:

- It provides breeders, whether local or from abroad, with legal protection by ensuring that they have exclusive rights to the protected plant varieties. This, in turn, allows them to recoup their investment in the development of those varieties.

- It contributes to economic development by making available to farmers a broad range of high-quality varieties and thereby generating more income and helping small and medium-sized enterprises to create more jobs.
- It facilitates the transfer of technology to farmers and to small and medium-sized enterprises.

With regard to the system's contribution to the economy, IPKEY and INDECOPI issued the first study on the economic impact of industrial property in Peru in June 2021. Its aim was to gauge how much sectors with a major IP rights component contribute to the Peruvian economy, with a focus on their impact on gross domestic product (GDP), foreign trade, employment and wages. It is based on the rights granted between 2015 and 2018.

For the first time, the contribution of the regime for plant variety protection was taken into account in the study, which found that:

- The contribution to GDP amounts to 1.993 billion soles, equivalent to 6 per cent of total agricultural output.
- The contribution to foreign trade amounts to 4.141 billion soles, equivalent to 33 per cent of farm exports.

3 STRATEGIES FOR PROMOTING THE PROTECTION OF PLANT VARIETIES

Our institution works in various ways to promote the protection of plant varieties:

- (a) **Technical support in matters of protection:** The aim of the *Pro-Obtentor* program is to encourage a culture of protecting new plant varieties in Peru, thereby fostering technological development and local agricultural research.

Individuals, companies, research centers and universities all benefit from the program. Services on offer include:

- Free consultations for institutions and companies on the scope and implications of breeders' certificates.
- Technical training on how to apply to the register for certificates.

(b) **Promotion and capacity-building:** INDECOPI also runs the Technology and Innovation Support Centers (TISC), the aim of which is to provide researchers, inventors, innovators and business people with general guidance and technical assistance on IP matters.

Beneficiaries include students, researchers and innovators. Services on offer include:

- Information on technology
- Training
- Guidance on IP rights

(c) **Awareness-raising:** We put out a variety of publications on plant breeders' rights and videos on processes and impact. They can be found at: <https://www.patenta.pe/en/pro-obtentor>.

(d) **Consulting and advisory services:** Interested parties and applicants may seek assistance, including general guidance, advice on specific matters and information regarding the status of applications, online, by phone or via email, free of charge.

4 STATISTICS

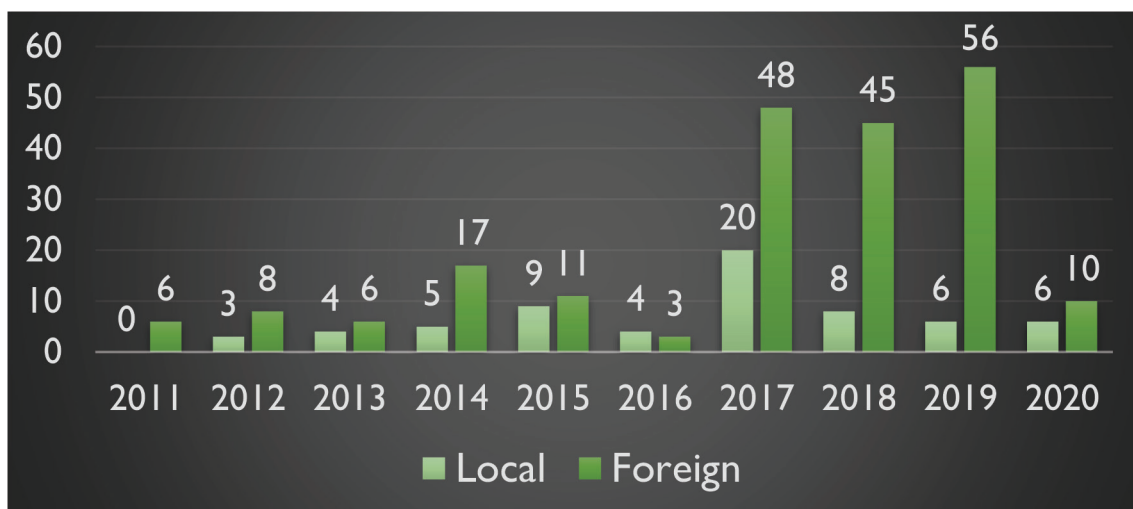


Figure 1. Breeders' certificates issued (by origin).

Source: Inventions and New Technologies Department (INDECOPI).

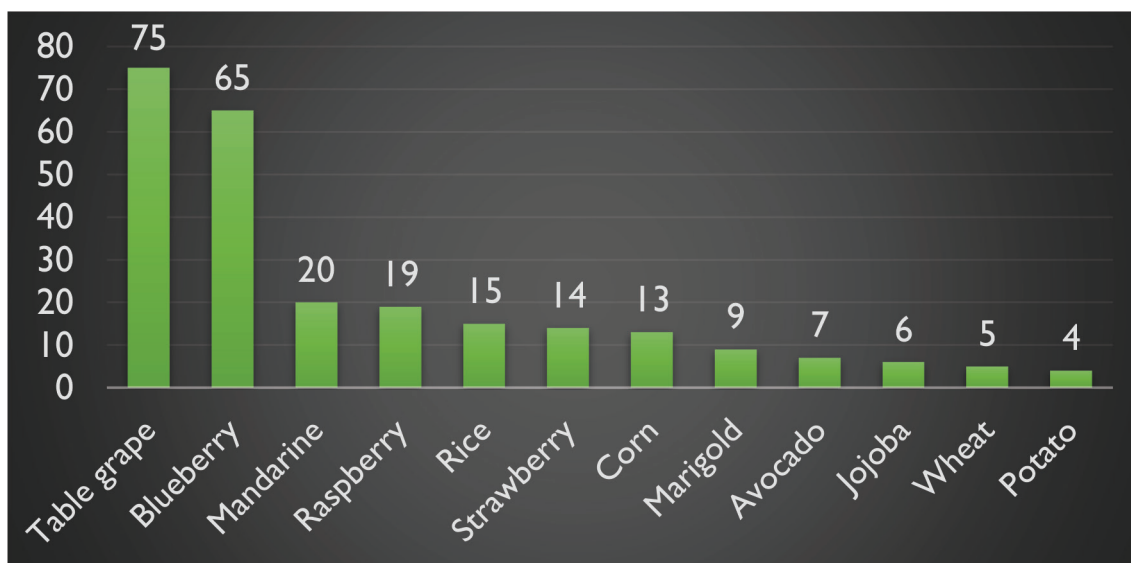


Figure 2. Breeders' certificates (by crop).

Source: Inventions and New Technologies Department (INDECOPI).

PRESENTATION MADE AT THE SEMINAR



01 LEGAL AND INSTITUTIONAL FRAMEWORK

02 THE IMPORTANCE OF THE SYSTEM FOR THE PROTECTION OF PLANT VARIETIES

03 STRATEGIES FOR PROMOTING THE PROTECTION OF PLANT VARIETIES

04 STATISTICS



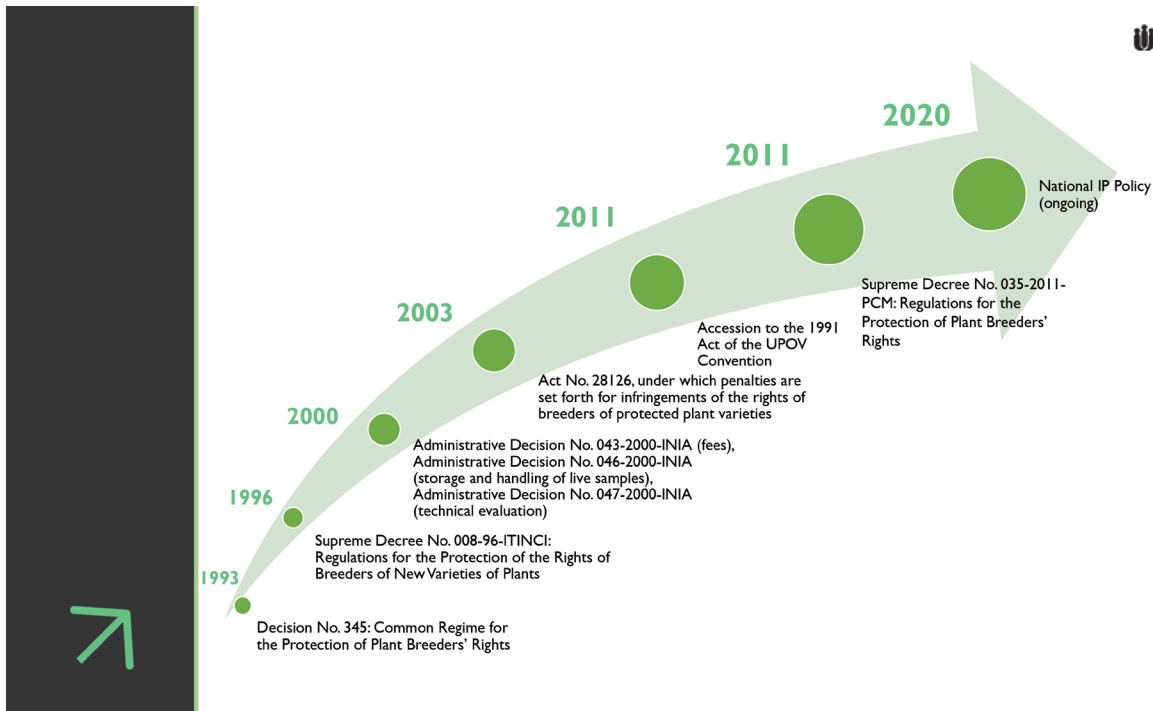
01

LEGAL AND INSTITUTIONAL FRAMEWORK

RELEVANT NATIONAL BODIES

- ✓ The National Institute for the Defense of Competition and Protection of Intellectual Property (INDECOPI), through its Inventions and New Technologies Department, is responsible in the first instance, at the national level, for carrying out the administrative functions set forth in Decision No. 345 (*Requirements: novelty and denomination*).
- ✓ The National Institute for Agricultural Innovation (INIA), through its Agricultural Innovation Management Department, is responsible, at the national level, for the technical aspects of the procedure (*Requirements: distinctness, uniformity and stability*).





02

THE IMPORTANCE OF THE SYSTEM FOR THE PROTECTION OF PLANT VARIETIES

THE IMPORTANCE OF THE SYSTEM FOR THE PROTECTION OF PLANT VARIETIES

- ✓ Provides breeders, whether local or from abroad, with legal protection by ensuring that they have exclusive rights to the protected plant varieties. That, in turn, allows them to recoup their investment in the development of those varieties.
- ✓ Contributes to economic development by making available to farmers a broad range of high-quality varieties and thereby generating more income and helping small and medium-sized enterprises to create more jobs.
- ✓ Facilitates the transfer of technology to farmers and to small and medium-sized enterprises.



CONTRIBUTION TO THE ECONOMY

- ✓ First-ever study on the economic impact of industrial property in Peru, drafted by IPKEY and INDECOPI (June 2021).
- ✓ The aim of the study was to gauge how much sectors with a major intellectual property (IP) rights component contribute to the Peruvian economy, with a focus on their impact on gross domestic product (GDP), foreign trade, employment and wages. It is based on the rights granted between 2015 and 2018.

Main findings:

- The contribution to GDP amounts to 1.993 billion soles, equivalent to 6 per cent of total agricultural output.
- The contribution to foreign trade amounts to 4,141 billion soles, equivalent to 33 per cent of agricultural exports.

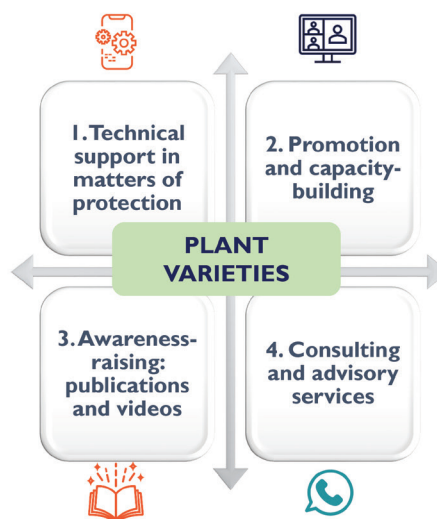




03

STRATEGIES FOR PROMOTING THE PROTECTION OF PLANT VARIETIES

¿What does INDECOPI do to promote the protection of plant varieties?



1. TECHNICAL SUPPORT IN MATTERS OF PROTECTION



Aim: To encourage a culture of protection for new plant varieties in Peru and thereby stimulate technological development and local agriculture research.

Beneficiaries: Individuals, companies, research centers and universities.

The following services will be offered to those interested:

- Free consultations for institutions and companies on the scope and implications of breeder's certificates.
- Technical training on how to apply to the register for certificates.



2. PROMOTION AND CAPACITY-BUILDING

TECHNOLOGY AND INNOVATION SUPPORT CENTERS (TISC)



Aim: To provide researchers, inventors, innovators and business people with general guidance and technical assistance on IP matters.

Beneficiaries: Students, researchers and innovators.

The following services will be offered to those interested:

- Information on technology
- Training
- Guidance on IP rights



3. AWARENESS-RAISING: PUBLICATIONS AND VIDEOS



4. CONSULTING AND ADVISORY SERVICES



Easy to use

Free of charge

Via Zoom

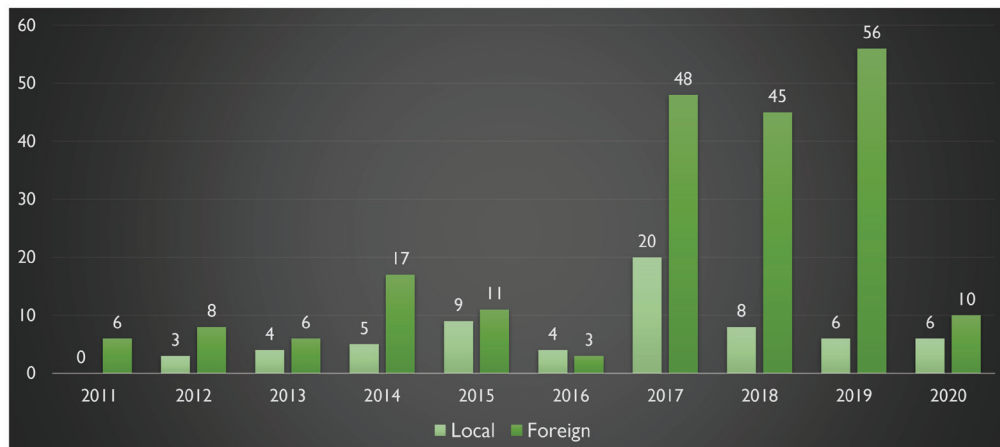
A range of advice sessions on plant varieties





04 STATISTICS

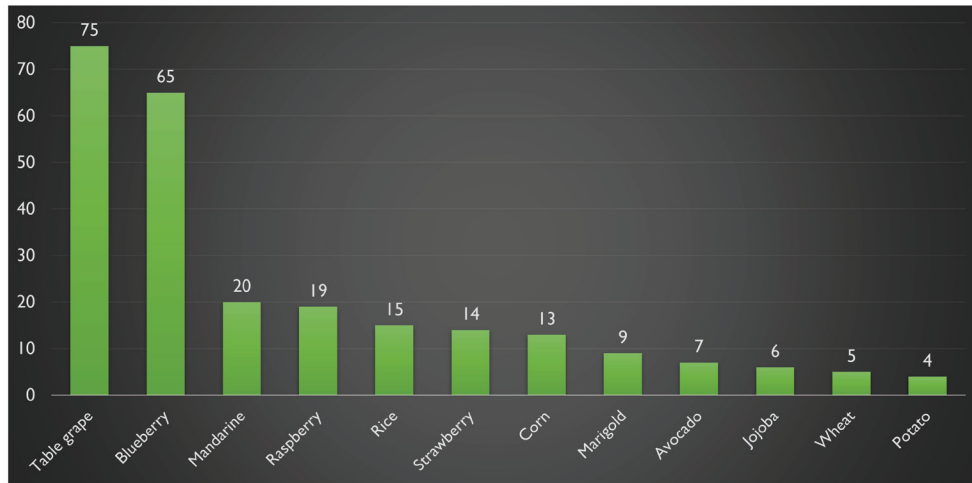
BREEDER'S CERTIFICATES ISSUED (BY ORIGIN)



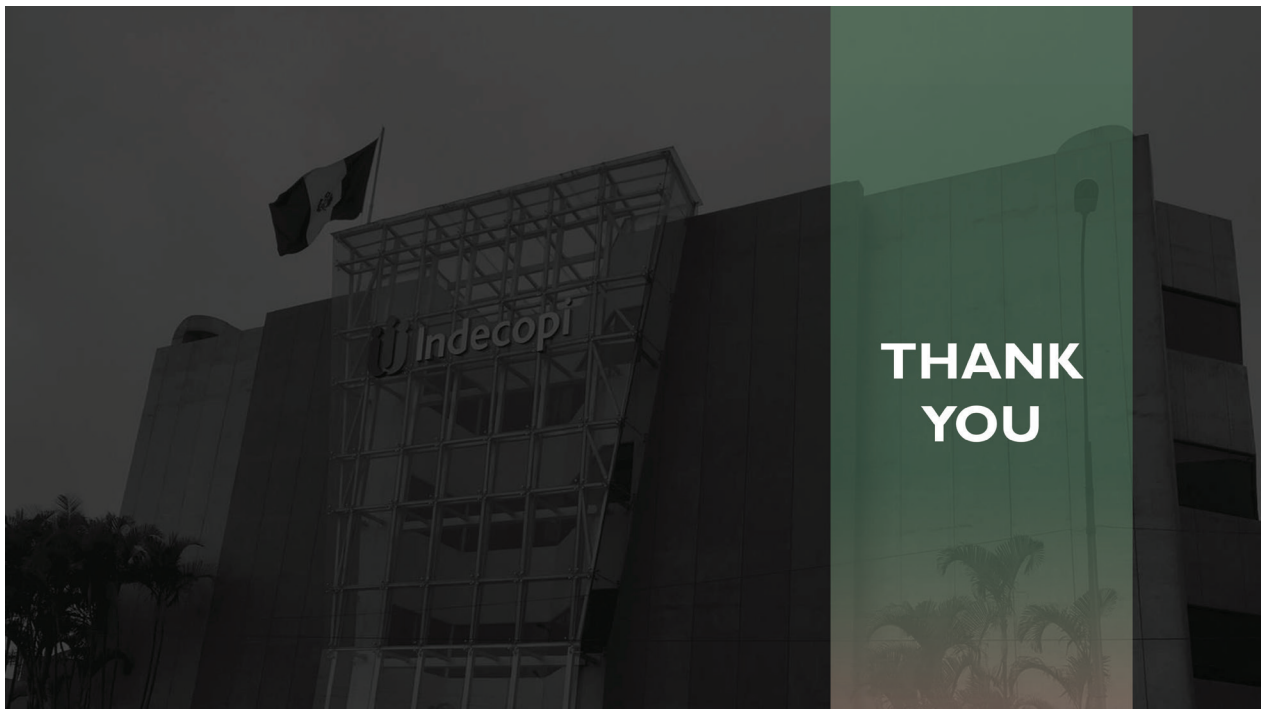
Source: Inventions and New Technologies Department (INDECOPI)



BREEDER'S CERTIFICATES (BY CROP)



Source: Inventions and New Technologies Department (INDECOPI)



SWEDEN

THE NEED TO SUSTAIN “SMALL” BREEDERS

MR. MAGNUS FRANZÉN, Deputy Head, Plant and Control Department,
Swedish Board of Agriculture

INTRODUCTION

Today, the world faces several challenges, including climate change, feeding a growing world population, loss of biodiversity, various environmental problems and the need to improve livelihoods. The United Nations Global Goals for Sustainable Development [1] describe and summarise the situation. Production of food and raw material for industry share these challenges with the rest of society. This year, the UN Food Systems Summit will be held [2], addressing precisely these critical issues. New measures, innovative solutions and plans to transform our food systems in the work with the sustainability goals will be discussed. Plant breeding could be a part of the solution to these challenges. One way of exploiting the full potential of plant breeding is to look at the possibilities for more local adaptation. New plant breeding techniques and different methods for developing locally adapted plant materials open up opportunities. However, the incentives for such a development are limited because the market for locally adapted material is far smaller. The Nordic market is an example of a small market where cultivation conditions often set limits for which varieties can be grown. For instance, varieties need to be adapted to local or regional conditions, such as temperature or day length. Prospects of return on investment are therefore lower than for varieties bred for commercially more significant markets or adapted to less-specific conditions. The challenges of breeding varieties for smaller markets and improved adaptation to local conditions are, to some extent, the same. These are plant breeding activities often performed by small to medium-sized companies and the public sector. It highlights the need to incentivise the situation for “small” breeders or breeding initiatives worldwide.

PLANT BREEDING IS A PART OF THE SOLUTION

Today there is an ongoing discussion on how to meet the numerous challenges of the world. There is a great need for action, and time is a limiting factor. Plant breeding as a solution that mitigates the effects of population growth, climate change, and other social and physical challenges has been emphasised on different occasions. The Second World Seed Conference was held in Rome in 2009 [3]. One of the conclusions from the conference was that plant breeding has “significantly contributed and will continue to be a major contributor to increased food security whilst reducing input costs, greenhouse gas emissions and deforestation”. Another conclusion from the same conference was that “intellectual property protection is crucial for a sustainable contribution of plant breeding and seed supply. An effective system of plant variety protection is a key enabler for investments in breeding and the development of new varieties of plants”.

Agriculture faces the challenge of raising productivity while ensuring sustainability and improving resilience [4]. To achieve these goals, innovation in the form of high-performing

varieties is essential. There will be a need for continued efforts that improve the plant material on traits related to yield stability and sustainability. It includes, for instance, work to improve yields, resistance to biotic stresses, tolerance to abiotic stresses, harvest security, and quality traits such as nutritional value. An effective system for plant variety protection is an essential precondition for this and a way to facilitate the work.

NEW TECHNIQUES FOR PLANT BREEDING

In recent years, several new techniques have been developed and are about to be implemented to facilitate the breeding of new crop varieties. These techniques are often referred to as “new plant breeding techniques” (NPBT). Cisgenesis, intragenesis, sequence-specific nuclease technology (e.g. CRISPR-Cas9), oligo-directed mutagenesis, RNA-dependent DNA methylation, reverse breeding, induced early flowering and grafting on GM rootstock are all examples of such techniques. The time and effort needed to produce a new variety can be reduced with the help of these techniques. In many cases, it would be possible to obtain the improved new variety with traditional breeding, but it would take much longer [5] [6] [7].

The use of these techniques may lead to an increase in the number of patents and a more complex situation in managing intellectual property rights. It might become an obstacle to the development of new plant varieties [8].

NEW METHODS FOR LOCAL ADAPTATION OF VARIETIES

One way of exploiting the full potential of plant breeding would be to look at the possibilities for more local adaptation, thus addressing the challenges mentioned earlier. Different methodologies to develop locally adapted plant materials have been tested and could be used in this context. Participatory plant breeding (PPB) is a concept that includes different ways of exploiting the potential gains of breeding for specific adaptation through decentralised selection. It can be done in several different ways. The Dutch potato breeding model, which involves a partnership between farmers and commercial breeding companies, is one example [9]. In PPB, farmers and other stakeholders are included and given the possibility of influencing major decisions at different stages of the plant breeding process. The process is similar to a conventional breeding program, but three main differences are often emphasised compared to a conventional breeding program. These are “(a) testing and selection take place on-farm rather than on-station, (b) key decisions are made jointly by farmers and breeder, and (c) the process can be independently implemented in a large number of locations” [10]. One of the advantages of the concept is that new varieties are put into practical use more quickly than in

traditional plant breeding. Evaluations show that it would be possible to use such methods in plant breeding work [10].

LACK OF INCENTIVES SLOWS DOWN DEVELOPMENT

New plant breeding techniques and different methods for developing locally adapted plant materials show new opportunities to work with the global challenges mentioned earlier. Progress in improving varieties could be made faster and more resource-efficiently. This applies to professional plant breeding companies, public breeding, and initiatives involving participatory plant breeding.

However, these improvements are often aimed at targeting the requirements and conditions of the world's commercially most important production areas. The incentives for plant breeding that provide varieties for smaller markets or improved adaptation to local conditions, for example regarding soil type, seasonal droughts and day length, are significantly weaker.

We regularly note that plant breeders, such as those commonly publicly funded and active in small and commercially less important markets, refrain from proper protection of their varieties. In particular, the cost of DUS (Distinctness, Uniformity and Stability) testing is identified as a contributing cause. This is particularly true for fruit trees and other woody crops subjected to three to four years of testing. Despite extended protection periods, the prospects of proper return on investment are bleak. Breeders, therefore, often choose weaker IP regimes such as, for instance, trademarks [11]. As a result, this further impairs the ability to cover the costs of developing new varieties.

DISCUSSION

Regarding incentives that drive development, breeding varieties for smaller markets or improved adaptation to local or particular conditions face the same problems. They apply to both small and medium-sized enterprises as well as both private and public actors.

As mentioned above, the smaller the market or area where the variety is suitable for cultivation, the more difficult it is to get return on investments. This is in contrast to the need to take advantage of the existing opportunities to meet global challenges. It limits the opportunities to work on a smaller scale. It also highlights the need to incentivise the situation for "small" breeders or breeding initiatives worldwide. Different ways forward could be examined to change this. Opportunities to streamline and simplify plant breeding work may be utilised. New business models could be explored where commercial and public interests jointly contribute resources

to drive development forward. Proven ways to support development through, for example, investments or support financed with public funds might be considered where possible.

From Sweden's point of view, the question of how the UPOV community can assist in alleviating the economic impact perceived by less resourceful members of the breeding community deserves to be discussed.

Within the framework of UPOV, the efforts made to explore the possibilities that molecular methods can have for DUS testing is an excellent example of work that can contribute to development in this direction. This work should therefore continue, including efforts made to:

- reduce the effect that the costs of obtaining and maintaining plant breeding rights have on development activities;
- facilitate access to patented new breeding technologies and their results; and
- facilitate the handling of several forms of intellectual property rights such as plant breeders' rights and patents at the same time.

Sweden would welcome an analysis of options that may exist within the UPOV community to address these issues. Ultimately, if we are to handle the challenges ahead, all ideas are needed.

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PRESENTATION MADE AT THE SEMINAR



THE NEED TO SUSTAIN “SMALL” BREEDERS

Magnus Franzén

Deputy Head

Plant and Control Department

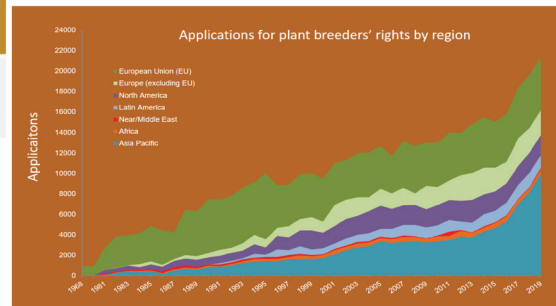
Swedish Board of Agriculture

2021-12-24

1



GLOBAL CHALLENGES - PLANT BREEDING A PART OF THE SOLUTION



Source: UN and UPOV

2021-12-24

2

EXPLOIT THE POTENTIAL OF PLANT BREEDING

- New plant breeding techniques and different methods for developing locally adapted plant materials, e.g. participatory plant breeding, show new opportunities to work with the global challenges.
- Progress in improving varieties could be made faster and more resource-efficiently.



Photo: Johan Ascard, Illustration: Creative common

2021-12-24

3

INCENTIVIZE THE SITUATION FOR “SMALL” BREEDERS OR BREEDING INITIATIVES

- Opportunities to streamline and simplify plant breeding work may be utilised.
- New business models could be explored where commercial, and public interests jointly contribute resources to drive development forward.
- Proven ways to support development through, e.g. investments or support financed with public funds might be considered when possible.
- The question of how the UPOV community can assist in alleviating the economic impact perceived by less resourceful members of the breeding community deserve to be discussed.



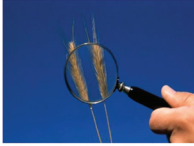
Photo: Conny Thålin

2021-12-24

4

HOW CAN THE UPOV COMMUNITY ASSIST?

Within the framework of UPOV, the efforts made to explore the possibilities that molecular methods can have for DUS testing. This is an excellent example of work that can contribute to incentivize the situation. This work should therefore continue, including efforts made to:



- reduce the effect that the costs of obtaining and maintaining plant breeding rights have on development activities,
- facilitate access to patented new breeding technologies and their results, and
- facilitate the handling of several forms of intellectual property rights such as plant breeders' rights and patents at the same time.

We would welcome an analysis of options that may exist within the UPOV community to address these issues. Ultimately, if we are to handle the challenges ahead, all ideas are needed.

Photo: *Urban Wigert*

UNITED STATES OF AMERICA

INITIATIVES FROM THE 2018 FARM BILL SUPPORTING
FARM PRODUCTION, CONSERVATION, AND PLANT
VARIETY PROTECTION IN THE UNITED STATES

MR. JEFFERY HAYNES, Commissioner, Plant Variety Protection Office,
United States Department of Agriculture (USDA)

The Agriculture Improvement Act of 2018 (USDA Farm Bill) is a collective bill that is the primary agricultural and food policy tool of the federal government.

Several important initiatives were introduced by the USDA Farm Bill, including amendments to the Plant Variety Protection (PVP) Act, advancements in urban agriculture and food security, addressing agricultural challenges, and authorization of hemp production in the United States.

The USDA Farm Bill amended the PVP Act to include protection of asexually reproduced varieties. Previously, a plant patent was the only avenue for protecting asexual plant innovations. Breeders can now use a PVP Certificate to complement their plant patent and/or utility patent. Breeders also enjoy the benefits of the close alignment of the PVP system to the International Union for the Protection of New Varieties of Plants (UPOV).

The USDA Farm Bill authorized the creation of the Office of Urban Agriculture and Innovative Production, which will administer urban agriculture grants, develop and carry out community compost and food waste reduction projects, establish a Federal advisory committee, and carry out new Farm Services Agency pilot programs in urban areas. The new program was authorized to spend \$25 million to establish the program and begin the urban pilot programs.

The Agriculture Advanced Research and Development Authority (AGARDA) was established. The goal of the AGARDA program is to support the development of innovative technologies to address food and agriculture challenges of tomorrow, while providing a new avenue for today's farmers to overcome their most pressing issues. The US Congress authorized \$50 million annually through 2023 for AGARDA grants and cooperative agreements.

The USDA Farm Bill reintroduced and authorized hemp for commercial production in both States and Tribal Nations. After a hiatus of almost 45 years, the 2014 Farm Bill reintroduced industrial hemp production in the US through State pilot programs to conduct research. The 2018 Farm Bill authorized commercial production of hemp for both States and Tribal Nations with approved plans and legally defined hemp as all forms of *Cannabis sativa* L. with no more than 0.3% Tetrahydrocannabinol (THC).

PRESENTATION MADE AT THE SEMINAR



United States Department of Agriculture

Agricultural Marketing Service

Creating Opportunities for American Farmers and Businesses



Plant Variety Protection Office

Agricultural Marketing Service

Plant Variety Protection Office



2018 Farm Bill Initiatives in the United States of America

US Plant Variety Protection Office

October 2021

Plant Variety Protection for Asexual Varieties

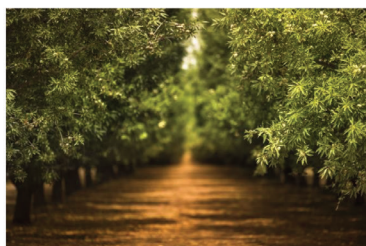
The Agriculture Improvement Act of 2018 (USDA Farm Bill) amended the Plant Variety Protection (PVP) Act to include protection of asexually reproduced varieties. Previously, a Plant Patent was the only avenue for protecting asexual plant innovations. Breeders can now use a PVP Certificate to complement their plant patent and/or utility patent. Breeders also enjoy the benefits of the close alignment of the PVP system to the International Union for the Protection of New Varieties of Plants (UPOV).



3

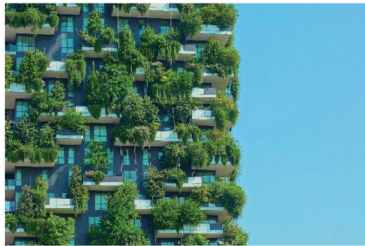
Plant Variety Protection for Asexual Varieties

The US Plant Variety Protection Office (PVPO) administers the PVP Act and follows the UPOV Test Guidelines (TGs) for all asexually reproduced varieties. PVPO accepts Distinctness, Uniformity, and Stability (DUS) reports for asexual crops from other UPOV Countries. Since January 6, 2010, the program has received applications for almond, apple, blackberry, calibrachoa, grapevine, hemp, magnolia, nightshade, phlox, and raspberry varieties for protection.



Office of Urban Agriculture and Innovative Production

The USDA Farm Bill authorized the creation of the Office of Urban Agriculture and Innovative Production which will administer urban agriculture grants, develop, and carry out community compost & food waste reduction projects, establish a Federal advisory committee, and carry out new Farm Services Agency pilot programs in urban areas. The new program was authorized to spend \$25 million to establish the program and begin the urban pilot programs.



- Local Food Promotion Programs
- Local Farmers Market Grants
- Farm to School Program
- Conservation Innovation Grants
- Organic Cost Share Program
- Beginning Farmer and Rancher Program
- Urban, Indoor, & Emerging Agriculture Competitive Grant Program
- Specialty Crop Research Initiative

Agriculture Advanced Research and Development

The Agriculture Advanced Research and Development Authority (AGARDA) was established. The goal of the AGARDA program is to support the development of innovative technologies to address food and agriculture challenges of tomorrow, while providing a new avenue for today's farmers to overcome their most pressing issues. The US Congress authorized \$50 million annually through 2023 for AGARDA grants and cooperative agreements.



- Development of new technology to protect the US food supply
- Enhancement of agriculture environmental sustainability
- Programs to increase agriculture resilience to extreme weather
- Research and development programs to assist the US agriculture industry

Hemp for Commercial Development

The USDA Farm Bill reintroduced and authorized hemp for commercial production in both States and Tribal Nations. After a hiatus of almost 45 years, the 2014 Farm Bill reintroduced industrial hemp production in the US through State pilot programs to conduct research. The 2018 Farm Bill authorized commercial production of hemp for both States and Tribal Nations with approved plans and legally defined hemp as all forms of *Cannabis sativa* L. with no more than 0.3% Tetrahydrocannabinol (THC).



- Regulations to produce hemp were effective March 22, 2021
- Establishes the Domestic Hemp Production Program under USDA
- USDA Agricultural Research Service to establish new collection of hemp germplasm
- State and Federal research programs available to farmers

Agricultural Marketing Service

Creating Opportunities for American Farmers and Businesses



 **USDA Plant Variety Protection Office**
1400 Independence Avenue, S.W.
Room 2915-South Building, Mail Stop 0274
Washington, D.C. 20250-0002
Main Office Telephone: (202) 260-8983
Email: PVPOmail@usda.gov

QUESTIONS

TORHEIM Svanhild-Isabelle Batta (Ms.), Norway (speaker)

My name is Isabelle Batta. I'm from the Ministry of Agricultural Food in Norway. Päivi from the European Union ended her very interesting presentation with a few questions, so I wonder if she could maybe share her preliminary answers herself to the important questions that she ended her presentation with. Thank you.

BUTTON Peter (moderator)

Thank you Bell; that that was a very good tactic to turn the questions around to the questioner, so Päivi I can give you the floor please

MANNERKORPI Päivi (Ms.), European Union (speaker)

Thank you Bell for this good question. I was expecting that this will come up so I think we have done already quite some work to improve the efficiency and efficacy of the plant variety protection system. I mentioned molecular techniques so there are quite some developments and we will have more in the future in many UPOV members and in international organizations. We are in the middle of working on digitalization and looking for the possibilities to use that. It will be an important part of our work; it will improve the system and hopefully make it easier and maybe also more accessible for small and medium-sized companies, but my question is can we do more?

Climate change is a very tricky issue and I think we would need to have more exchanges and more presentations and knowledge sharing on what is happening in plant breeding. There are probably new breeding targets, also the sustainable development targets will ask plant breeding to adapt and introduce for example probably new species. We had in the beginning of the week the Euroseeds Conference and there was a discussion for example about carbon sinks, carbon farming, and probably this could require new species so this will have an impact on our plant variety right system and the testing protocols. Also the changing environment is relevant. I have learned that in Europe in certain countries they have experienced drought in the last couple of years and this raises the question on how to protect the DUS trials. So there are a lot of open questions and the suggestion from the European Union would be to have a follow-up seminar on climate change so it would be good to set the scene by experts. For example, from the Climate Panel ICPP (Intergovernmental Panel on Climate Change) there will be two

new reports next year especially on agriculture on what kind of changes there will be. Then it would be important to learn from breeders, whether private or public, on how they change their breeding strategy and then at the end how shall we adapt the plant variety protection system. Thank you.

BUTTON Peter (moderator)

Thank you Päivi; that was a very good question and a very informative answer. I am very pleased to say that we have a request for the floor from Marcus Goffe from Jamaica.

GOFFE Marcus (Mr.), Deputy Director/Legal Counsel, Jamaica Intellectual Property Office, Kingston, Jamaica

A pleasant morning afternoon everyone. I just wanted to ask about the integration of the Seed Law as well as integration of protection of traditional knowledge and cultural expressions in the plant variety system. We heard a bit about that, but I wanted just to ask maybe, if I could, Kenya and Norway how those have been integrated in order to achieve a balance in the multiple regimes. Thank you.

BUTTON Peter (Moderator)

Thank you very much Marcus, so Norway or Kenya would you like to raise your hand? Thank you Simon, please go ahead.

MAINA Simon Mucheru (Mr.), Kenya (speaker)

Thank you very much Marcus for the question, which I understand is about how we integrate the Seed Law and plant variety protection. Let me say that in Kenya we have the same law, the Seed and Plant Varieties Act that covers seed certification, plant variety protection and National Listing. They're all covered under the same law and all these are administered under the same Office. What we have done in the Law is to ensure that there is no conflict between the three concepts: National listing, seed certification and plant variety protection. We have ensured in the Law that there is no conflict in the way the system works and there is an advantage when it comes to enforcement of plant variety protection. In Kenya, we operate a system for compulsory certification, especially for what we call the main crops, the main food security crops where seed is produced locally. So one of the advantages of that integration is that in case of any infringement, it is easy for the seed inspectors to pick it up because the same seed inspectors

are involved in conducting of the DUS test and they are familiar with the DUS reports and they use the DUS reports in inspection as the descriptors, so it becomes easy for them to identify a case of an infringement over the variety. Also the seed certification system has a traceability of varieties, especially the parentals, so it becomes easy to pick it up. In fact, there has been a wider area whereby the same organization handles import/exports of plant materials and matters of phytosanitary and plant health and therefore it also becomes easy in case of infringement, especially for the flowers. It can easily be picked again by the plant inspector, so I would say the system has coexisted well and it has been to the advantage of plant variety protection. Yes, plant variety protection in Kenya, enforcement is by the right holder, but sometimes by virtue of the fact that KEPHIS plays a role in all these activities, production of seed, importation–exportation of plant materials, many complainants will come to KEPHIS for arbitration. Since you find that even the infringer is a client of KEPHIS there is an understanding that we can have a discussion and have a gentleman’s agreement without necessarily going to the Court. So I will say that the system works well to the advantage, considering also we have the shortage of staff, so when we are doing DUS for plant variety protection we are able to use the experience of the seed inspectors and that has worked well. Thank you very much.

BUTTON Peter (Moderator)

Thank you very much Simon. The question was also directed to Norway.

TORHEIM Svanhild-Isabelle Batta (Ms.), Norway (speaker)

They are separate laws in Norway, but both are administered by the Food Safety authorities and so just to make a brief comment on both. Both laws try to meet several objectives at the same time so more in my presentation I shared how we are balancing plant breeders’ rights and farmers’ rights. In the Plant Breeder’s Right Act, this is done by keeping UPOV 1978 Act, which then indirectly gives farmers right to save seeds from their own harvest. While in the seed regulation the main purpose of course is to ensure plant health and quality seeds; we made an amendment to the objectives a few years ago to better accommodate the registration of varieties that are not fulfilling the ordinary DUS criteria. So we have experienced the registration of conservation varieties, as well as being more flexible on those seeds. So that was just very briefly on trying to meet several objectives in these laws. Thank you.

BUTTON Peter (Moderator)

Thank you very much Bell. We now have a question from the María Laura Villamayor from Argentina.

VILLAMAYOR María Laura (Sra.), Coordinadora de Relaciones Institucionales, Instituto Nacional de Semillas (INASE), Secretaría de Agricultura, Ganadería y Pesca, Buenos Aires, Argentina

Thank you to all the speakers for their very enriching presentations. My questions relate to the mechanisms or tools that could be created to ensure the production of certain plant varieties in an organic and friendly structure with the environment. I have two questions: The first to the European Union on whether organic agriculture was envisaged in large expanses such as those that are managed in Argentina and the second question directed to the United States of America, on the number of registered *Cannabis sativa* varieties as there seems to be a large interest in Argentina as well. Over the last period, in a very few months we have received already some 30-plus applications so I wanted to compare the numbers in the United States of America.

BUTTON Peter (Moderator)

Thank you María Laura. I will invite Jeff to answer the question about the cannabis in the United States of America and then afterwards Päivi, to answer the question for the European Union please.

HAYNES Jeffrey (Mr.), United States of America (speaker)

Yes thank you for the question. As of this month since the implementation of the hemp law to reintroduce it, we have received over 10 varieties for protection, close to 15. The first six to eight applications we received were seed hemp varieties and now we have been receiving asexually reproduced hemp varieties, so there is great interest and we do anticipate quite a few more varieties in the close future here. Thank you

BUTTON Peter (Moderator)

Thank you Jeff for a very clear demonstration of breeders responding to the market there and next, Päivi, I would be grateful if you could respond to María Laura's question. Thank you.

MANNERKORPI Päivi (Ms.), European Union (speaker)

Thank you Peter and thank you Laura for this question on organic agriculture production. So the European Union has a very ambitious target of 25% of agriculture land under organic production and I believe at the moment it is around 8%, with big differences among the

member States. In the beginning of next year, a new regulation on organic agriculture in the European Union will enter into force and this will support the agriculture production. Also, the European Union's common agriculture policy has a number of measures in relation to organic agriculture to support it and, as like other UPOV members, we have a separate European Union legislation on market access of seed and plant varieties. In the European Union seed legislation we can also take a number of measures to support the marketing of different kind of varieties and at the moment we are looking at rules on organic varieties bred and intended for organic agriculture and covering the needs of organic agriculture. Actually, we are planning to set up derogations in a kind of form of a temporary experiment to test the different DUS and Value for Cultivation and Use requirements for these organic varieties. Another interesting item might be that under the new organic regulation of the European Union we also set up, a system of that we call organic heterogeneous material. This is not a variety, not even a mixture of varieties, but simply heterogeneous materials and certain rules were set up on how to produce this material under organic conditions. So these are all elements that should support the organic agriculture production in the European Union. Thank you.

BUTTON Peter (Moderator)

Thank you very much Päivi. This brings the question and answer session to a close and indeed brings the session on presentations to a close as well. Before we move on to the next part, I would just like to express my sincere thanks to the speakers for their excellent presentations and their strict adherence to time, which was very much appreciated and enabled the seminar to work well, and also my sincere thanks to all participants taking the floor and asking questions for respecting the arrangements as well.

With that, it is my pleasure to pass over the proceedings to Mr. Marien Valstar, President of the UPOV Council.

CONCLUDING REMARKS

MR. MARIEN VALSTAR, President of the UPOV Council

Dear Participants,

We have heard today the following key messages:

Canada: PBR creates level playing field where private, public and or Public Private Partnerships (PPS) can operate in the marketplace.

China: showed the successful development of PVP in China, including a roadmap to implement UPOV91.

The EU: showed the many challenges we face globally (SDGs) and the strategies that are being implemented to face these challenges, showing that plant breeding is a key element in reaching the goals.

Japan: highlighted improvements in its PVP and Seed Act and showed the initiative to establish e-PVP Asia, leading to more collaboration in the region.

Kenya: gave an overview of PVP in Kenya and showed the positive impact on food security, employment and farmers livelihood.

Mexico: gave insight into their plans to enhance agricultural productivity by promoting plant breeding and quality seeds, thereby including subsistence farmers in the process.

Norway: highlighted the importance of plant breeding for sustainable food systems, indicating that we need to consider farmers rights and plant breeders rights.

Peru: gave an overview of its national system, showing the result of a study that PVP contributed 6% to its Gross Domestic Product, and showed a program to encourage more development and research in Peru through PVP.

Sweden: indicated that plant breeding is a part of the solution to the global challenges we face, and asked how the UPOV community could assist in making plant breeding more accessible for 'small breeders'.

The USA: gave an overview of recent improvements in the Farm Bill, initiatives that foster urban agriculture and an initiative to invest more in agricultural research and development.

All contributors highlighted that plant breeding and improved varieties are an important part of the solution to key policy challenges. A solution that can help us to achieve important goals in food security, sustainable agriculture, economic development and improving livelihood of farmers, including smallholder farmers.

All contributors also gave insight in developments and initiatives in their countries or regions, indicating that a lot of work is done at national and regional levels to improve their systems and to promote plant breeding.

However, that does not mean that we now can rest. The speakers also indicated that there are improvements needed at the international level, including the need to ensure that improved varieties are reaching those farmers that have the most to gain from improved varieties.

Like all farmers, smallholder farmers worldwide need access to better varieties. There are different strategies to work towards that goal. I sincerely hope that our efforts to develop guidance concerning smallholder farmers in relation to private and non-commercial use will be helpful in clarifying that the UPOV system can bring benefits to smallholder farmers. Next week during we will discuss the way forward.

Another topic, that was mentioned frequently, was the impact of climate change and the need for agriculture to adapt and to mitigate climate change. It is clear that plant breeding and, therefore, UPOV has an important role to play here. We have had many presentations today that referred to this theme but there has been very limited time to learn about this in any depth. It seems to me that we need a further opportunity to explore this crucial topic and I would like to propose that consideration be given by UPOV to organizing a seminar next year, dedicated to this theme.

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