Effective System of Plant Variety Protection in Responding to Challenges of a Changing World: UPOV Perspective*

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The UPOV Convention was adopted in 1961, and it entered into force in 1968. The Convention aims at encouraging innovation in the field of plant breeding. It provides a legal framework and system of implementation of plant variety protection and is the only internationally harmonized, effective *sui generis* system of plant variety protection. The UPOV Convention was amended in 1972, 1978 and 1991. UPOV had 68 members as on 4 November 2010, and the numbers continue to expand. The impact study carried out by an *ad hoc* working group, and published by UPOV has shown the benefits of an effective *sui generis* system of plant variety protection.

**Keywords**: UPOV, plant variety protection, breeder’s right

Responding to the challenges of a changing world could be the *raison d’être* of plant breeding. Plant breeders have used germplasm resources for developing new varieties that respond to particular environments and meet consumer demand. The breeding process must meet the demands of a changing environment, such as, evolution of varieties that are resistant to diseases and other stress factors, or those varieties that perform well in different agroclimatic environments and farming situations; while responding to evolving consumer demand. For plant breeders, the world has been constantly changing. Plant breeding requires considerable investment in time and resources. It can be relatively quick and easy to reproduce new varieties but without the ability to cover their investment, breeders may be unable to further invest in breeding. The International Convention for the Protection of New Varieties of Plants (UPOV Convention¹) pioneered the establishment of the Plant Variety Protection (PVP) system to provide a legal framework that encourages plant breeding; thereby responding to the challenges of changing world.

The UPOV system of PVP follows the general principles of intellectual property protection. Thus, it encourages innovation in the plant breeding field, and also provides the breeder with the possibility of recovering investment in plant breeding work by making the reproduction and commercial exploitation of varieties subject to the breeder’s authorization. It is estimated that, within UPOV members, protection has been sought for varieties of approximately 3,000 genera or species. In 2009, more than 10,000 titles were granted to breeders by UPOV members. These figures indicate the scale of the UPOV system and demonstrate why cooperation between UPOV members is a key benefit of UPOV membership. In this respect, the guidance developed by UPOV for testing distinctness, uniformity and stability (DUS testing) of plant varieties promotes harmonization between members of the Union, thereby facilitating the exchange of information and DUS testing. UPOV members have provided information on their practical experience in DUS testing for more than 2,200 genera and species on the basis that they are willing to share that experience with other UPOV members. Furthermore, there are agreements for cooperation in DUS testing between UPOV members in relation to more than 1,300 genera and species. Overall, the UPOV Convention has led to the development of an

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effective system of PVP and UPOV membership has responded to the various demands of various countries and regions. This article reviews the salient features, growth and impact of the UPOV system.

Selected Provisions of the UPOV Convention

Breeders and Varieties

Breeder

The person who can apply for PVP by means of a ‘breeder’s right’ is the person who breeds a new variety i.e., the ‘breeder’. The definition of ‘breeder’ is important because it identifies who is entitled to apply for, and, if the conditions are fulfilled, obtain, a breeder’s right. Article 1(iv) of the 1991 Act of the UPOV Convention defines a breeder as, ‘the person who bred, or discovered and developed, a variety; the person who is the employer of the aforementioned person or who has commissioned the latter’s work, where the laws of the relevant Contracting Party so provide, or the successor in title of the first or second aforementioned person, as the case may be.’

It is important to observe that the concept of ‘person’ embraces both physical persons and legal persons. The breeder might be, for example, an amateur gardener, a farmer, a scientist, a plant-breeding institute or an enterprise specialized in plant breeding.

The plant-breeding techniques used can range from traditional breeding techniques, such as crossing and selection, through to new technologies, such as genetic engineering. The UPOV Convention makes no restrictions in this regard.

Discoveries may be the initial step in the process of breeding a variety, however, the phrase ‘the person who bred, or discovered and developed, …’ means that a mere discovery or find would not entitle the person to protection. Rather, development of the variety by the breeder is necessary for the breeder to be entitled to obtain protection.

Only the breeder as defined in Article 1(iv) of the 1991 Act of the UPOV Convention is entitled to be granted a breeder’s right. The 1991 Act of the UPOV Convention provides, under its Article 21(1)(iii), that ‘[e]ach Contracting Party shall declare a breeder’s right granted by it null and void when it is established [ … ] (iii) that the breeder’s right has been granted to a person who is not entitled to it, unless it is transferred to the person who is so entitled.’

Variety

A variety is the object of protection, which is defined in Article 1(vi) of the 1991 Act of the UPOV Convention: ‘variety means a plant grouping within a single botanical taxon of the lowest known rank (Fig. 1), which grouping, irrespective of whether the conditions for the grant of a breeder’s right are fully met, can be defined by the expression of the characteristics resulting from a given genotype or combination of genotypes, distinguished from any other plant grouping by the expression of at least one of the said characteristics, and considered as a unit with regard to its suitability for being propagated unchanged.’

Conditions of Protection

The UPOV Convention (Article 5) establishes distinctness, uniformity and stability (DUS) as criteria to be satisfied for the protection of a variety.

Distinctness

A variety is deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge (‘variety of common knowledge’) at the time of filing of the application. The term ‘variety of common knowledge’ is not restricted to protected varieties. To be protectable, a variety must be distinct from all varieties of common knowledge. Furthermore, ‘common knowledge’ is not restricted to national or geographical borders.

Uniformity

A variety is deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics. This notion of uniformity ensures that the variety can be defined as far as it is necessary for the purpose of protection. This is indicated by the notion of sufficiently uniform, i.e., the criterion for uniformity does not seek absolute uniformity. The UPOV Convention links uniformity requirement for a variety to the particular features of its propagation. This means that the level of uniformity required for truly self-pollinated varieties, mainly self-pollinated varieties, inbred lines of hybrid varieties, vegetatively propagated varieties, mainly cross-pollinated varieties, synthetic varieties and hybrid varieties will, in general, be different. Furthermore, it relates only to the characteristics which are relevant for the protection of the variety.

Stability

A variety is deemed to be stable if its relevant characteristics remain unchanged after repeated
propagation or, in the case of a particular cycle of propagation, at the end of each such cycle. As with the uniformity requirement, the criterion for stability has been developed to establish the identity of the variety as the subject matter of protection. Thus, the criterion for stability relates only to the relevant characteristics of a variety.

Other Conditions
The two other criteria that a variety must fulfill in order to be protected are (i) novelty, i.e. the variety must be ‘new’ in the sense that it must not have been sold or disposed of to others during a specified period prior to the filing date of the application, and (ii) the variety must be given a suitable denomination. The grant of protection must not be subject to any further conditions, provided that the applicant complies with all the formalities and pays the required fees (Article 5).

Breeder’s Right
Duration of Protection
The minimum period of protection as per Article 19 is 20 years from the date of grant of the breeder’s right, or 25 years in the case of trees and vines, which is designed to ensure an adequate incentive for the long-term investment that is necessary in plant breeding.

Scope of the Breeder’s Right – Material Covered
The plant breeder’s right means that the authorization of the breeder of a protected variety (titleholder) is required for certain acts (Article 14(1)(a) of the 1991 Act of the UPOV Convention). It should, however, be emphasized that the breeder’s right does not give a breeder the right to grow or commercialize the variety. The protection of a variety is independent of the measures regulating the production, certification and marketing of material of varieties. Irrespective of whether a variety is protected or not, there may be provisions of legislation to be met before a variety can be released onto the market; for example, environmental legislation concerning the release of genetically modified varieties and/or variety registration requirements involving a minimum level of agronomic performance (e.g., yield, disease-resistance).

The acts which require authorization of the breeder of a protected variety with respect to propagating material (e.g., seeds, bulbs, tubers, cuttings, etc.) are: production or reproduction (multiplication), conditioning for the purpose of propagation, offering for sale, selling or other marketing, exporting, importing, and stocking for any of the above purposes.

The use of propagating material without authorization of the titleholder triggers an extension of the breeder’s right to the harvested material obtained from that propagating material (i.e. the unauthorized propagating material) of the protected variety. The UPOV Convention, in its Article 14(2), provides the breeder with a right concerning the harvested material. Thus, the breeder’s right extends to harvested material if, (i) the material is obtained through the unauthorized use of propagating material, and (ii) the breeder has not had reasonable opportunity to exercise his right in relation to the propagating material.

In addition, Article 14(3) of the UPOV Convention contains an optional provision which allows members of the Union to extend the scope of the breeder’s right to products made directly from harvested material, where this has been obtained through the unauthorized use of harvested material of the protected variety which has itself been obtained from unauthorized propagating material, unless the breeder has had reasonable opportunity to exercise his right in relation to the harvested material.

Scope of the Breeder’s Right – Varieties Covered
In addition to the protected variety itself, the scope of breeder’s right also applies, as stated in Article 14.5 of the 1991 Act of the UPOV Convention, to varieties which are not clearly distinguishable from the protected variety, varieties whose production requires repeated use of the protected variety, which covers, in particular, varieties which are used to produce hybrid varieties, and essentially derived varieties.

Essentially Derived Varieties
The purpose of the provision on essentially derived varieties (EDVs) (Article 14(5)) is to ensure that the Convention encourages sustainable plant breeding development. The UPOV Convention lists some ways in which an essentially derived variety may be obtained: ‘Essentially derived varieties may be obtained for example by the selection of a natural or induced mutant, or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, or transformation by genetic engineering.’

Exceptions to the Breeder’s Right
The UPOV Convention establishes both compulsory and optional exceptions.
Compulsory Exceptions

Acts done Privately and for Non-Commercial Purposes
For example, the propagation of a variety by a farmer exclusively for the production of a food crop to be consumed entirely by that farmer and the dependents of the farmer living on that holding, may be considered to fall within the meaning of acts done privately and for non-commercial purposes. Therefore, activities, including ‘subsistence farming’, where these constitute acts done privately and for non-commercial purposes, may be considered to be excluded from the scope of the breeder’s right, and farmers who carry out these kinds of activities freely benefit from the availability of protected new varieties.

Acts done for Experimental Purposes
The breeder’s right does not extend to the use of the protected variety for experimental purposes.

Breeder’s Exemption
The exception under Article 15(1)(iii) states that the breeder’s right shall not extend to ‘acts done for the purpose of breeding other varieties, and, except where the provisions of Article 14(5) apply, acts referred to in Article 14(1) to (4) in respect of such other varieties.’ This is a fundamental element of the UPOV system of PVP known as the ‘breeder’s exemption’, whereby there are no restrictions on the use of protected varieties for the purpose of breeding new plant varieties. The wording also clarifies that, except for the varieties included in Article 14(5), i.e. essentially derived varieties; varieties which are not clearly distinguishable of the protected variety and varieties whose production requires the repeated use of the protected variety, the commercialization of the new varieties obtained does not require the authorization of the title holder of the protected variety used to create those new varieties (Fig. 2).

Optional Exception
Farm-Saved Seed
The Convention explains that, ‘[n]otwithstanding Article 14 (ref. 3), each Contracting Party may, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder’s right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or a variety covered by Article 14(5)(a)(i) or (ii)’

#Except for (i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety, (ii) varieties which are not distinguishable in accordance with Article 7 from the protected variety, and (iii) varieties whose production require the repeated use of the protected variety.

Fig. 2—Illustration of breeder’s exemption in UPOV system of plant variety protection

The inclusion of the optional exception in the 1991 Act of the UPOV Convention recognizes that, for some crops, there has been a common practice of farmers saving the product of the harvest for propagating purposes, and this provision allows each member of the Union to take account of this practice and the issues involved on a crop-by-crop basis, when providing plant variety protection. The use of the words ‘within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder’ is consistent with an approach whereby, if the optional exception is implemented, it is done in a way which does not undermine the incentives provided by the UPOV Convention for breeders to develop new varieties.

Growth and Impact of the UPOV System of PVP
Most countries which have already introduced a PVP system have chosen to base their system on the UPOV Convention in order to provide an effective, internationally recognized system. As on 4 November 2010, 68 countries and European Union (a supra-national community representing 27 countries) are members of UPOV (Table 1). Further, many countries, including developing countries and countries in transition to a market economy, are considering the introduction of a system for the protection of new varieties of plants. Besides, several other States and intergovernmental organizations have been in contact with the Office of the Union for assistance in the development of laws based on the UPOV Convention.
Table 1—Members of UPOV as on 4 November 2010

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¹Bound by the 1961 Convention as amended by the Additional Act of 1972 as the latest Act
²Bound by the 1978 Act as the latest Act
³Bound by the 1991 Act as the latest Act
⁴Operates a (supranational) community plant variety rights system which covers the territory of its 27 members

With respect to the purpose of a PVP system, UPOV clarifies that its mission is ‘to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society’. Thus, the UPOV system of PVP is designed to encourage innovation in the field of plant breeding, in order to promote the development of new varieties that will benefit society. Society in this context means all society, and all members of society are consumers in some way. However, it is also recognized that farmers and growers are the deliverers of the benefits of new varieties to society and are also the first beneficiaries of new varieties which offer improved income through improved yields, improved quality and the opening-up of new market possibilities.

In addition, the following are the States and intergovernmental organizations which have initiated the procedure for acceding to the UPOV Convention:

Seventeen States including Armenia, Bosnia and Herzegovina, Egypt, Guatemala, Honduras, India, Kazakhstan, Malaysia, Mauritius, Montenegro, Peru, Philippines, Serbia, Tajikistan, the former Yugoslav Republic of Macedonia, Venezuela and Zimbabwe, and one organization, namely, the African Intellectual Property Organization (OAPI) which consists of 16 members: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d’Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, Togo.

Also 21 States (Algeria, Bahrain, Barbados, Cambodia, Cuba, Cyprus, El Salvador, Ghana, Indonesia, Iraq, Islamic Republic of Iran, Lao People’s Democratic Republic, Libyan Arab Jamahiriya, Pakistan, Saudi Arabia, Sudan, Thailand, Tonga, Turkmenistan, United Republic of Tanzania and Zambia) and two intergovernmental organizations (African Regional Intellectual Property Organization, ARIPO with 17 members and Southern African Development Community (SADC) with 15 members have been in contact with the Office of the Union for assistance in the development of laws based on the UPOV Convention.

As a means of providing countries considering the introduction of a PVP system with information on the benefits they might expect, in 2005, UPOV published the ‘UPOV report on the impact of plant variety protection’ (impact study). The report was based on the work of a UPOV ad hoc working group to study the impact of plant variety protection, which included members from all the countries forming the basis of the impact study. The basis of the impact study and some of the key findings are summarized in the following sections.

UPOV Report on the Impact of PVP (Impact Study)

In relation to the impact which might be expected from an effective PVP system, it is considered important to recognize that the positive effects of a PVP system may be realized in the form of an incentive to stimulate new breeders and new breeding work and/or providing a basis for more effective breeding work at the domestic level. These positive effects could relate equally to the private breeding sector, the public breeding sector or to partnerships between the two. However, whilst recognizing that
such an impact is of critical importance, it is recognized that an effective PVP system can also provide important benefits in an international context by removing barriers to trade in varieties, thereby increasing domestic and international market scope. In short, breeders are unlikely to release valuable varieties into a country without adequate protection. With access to such valuable foreign-bred varieties, domestic growers and producers have more scope to improve their production and to export their products. It is also recalled that, as a consequence of the breeder’s exemption in the UPOV Convention, domestic breeders also gain access to valuable varieties for use in their breeding programs. This international aspect is an important means of technology transfer and effective utilization of genetic resources. Therefore, the impact study considered the development of the UPOV system at the international level as well as at individual, country level. Two of the main sections of the impact study: (i) Development of the UPOV system of plant variety protection and (ii) ‘Reports on studies conducted in individual countries’ are revisited with updated information.

Development of the UPOV System of PVP

UPOV Membership

The UPOV Convention which was adopted in 1961 entered into force in 1968 with the ratification of Germany, the Netherlands and the United Kingdom. The UPOV Convention was amended in 1972, 1978 and 1991. As on 4 November 2010, UPOV had 68 members of which 45 were bound by the 1991 Act of the Convention. UPOV continues to be the only internationally harmonized, effective sui generis system of PVP. Fig. 3 further illustrates how membership of UPOV has expanded since 1990 to cover most important agricultural producers and many countries from the developing world.

The key to an effective PVP system is to provide incentives to breeders to develop new varieties and avoid absence of suitable protection being a barrier to the availability of those varieties. With regard to assessing the overall impact of an effective PVP system from a global viewpoint, it is, therefore, reasonable to look at the number of new varieties. A direct measure of the number of new varieties is provided by the number of applications for protection (applications) and the number of titles of protection granted to new varieties of plants (titles). The number of applications and titles are meaningful measures of the impact of PVP, since they indicate new varieties which have potential importance within the territory concerned. It is recognized that, in a market economy, the value of a variety is ultimately determined by whether it is commercially successful. Therefore, the fact that, in general, breeders do not pursue protection of varieties which are unlikely to be successful or where protection is not important, would seem to offer further confirmation that the number of applications and titles are good indicators of the benefits of a PVP system.

Thus, an illustration of the overall impact of the UPOV system is provided by the number of titles of protection in force within UPOV. Fig. 4A shows the number of titles in force with UPOV members and the Community Plant Variety Office of the European Union (CPVO) for the period 1974 to 2007. The CPVO is a European Union agency which manages a system of plant variety rights, in conformity with the 1991 Act of the UPOV Convention, covering the Member States of the European Union (Community PVP system). The CPVO data have been included since their introduction in 1995 because, whilst the European Union only became a member of UPOV in 2005, most of the Member States were members of UPOV in 1995. With the expansion of UPOV, the importance of PVP has grown in different regions, as illustrated by the number of applications presented in Fig. 4B. The growth in the UPOV membership of countries from Asia, Latin America and countries in transition to a market economy between 1983 and 2003 is reflected in their growing use of the PVP system.

Fig. 3—UPOV membership (shown in green) (a) in 1990 and (b) in 2010
Expanding the Protection across Plant Genera and Species

The UPOV Convention recognizes that it is important to encourage breeding in all plant genera and species and not to attempt to pre-determine for which genera and species breeding would, or might, be beneficial. In 1975, protection had been granted to varieties of approximately 500 plant genera or species, growing to around 900 by 1985 and over 1,300 by 1995. It is estimated that protection had been sought for varieties of approximately 3,000 genera or species by 2010.

Expansion of UPOV: Benefit for New and Old Members

The following section observes the way in which the expansion of UPOV benefits older and newer UPOV members. To look at the situation from the perspective of oldest and newest members, the section categorizes countries into those which were UPOV members by 1992 (older members) and those which became members at a later date (newer members). The year 1992 was chosen because, as can be seen in Fig. 4, that year signified the end of a period of fairly stable membership and the start of a continuous expansion in membership.

Older UPOV Members: The European Union Countries

Fig. 5 demonstrates how the European Union has offered an increasingly important market for breeders from outside the European Union. On the other hand, Fig. 6, which analyses the number of applications made by residents of 10 European Union countries (Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden and United Kingdom which were UPOV members by 1992) with UPOV members other than those belonging to the European Union countries, demonstrates that the expansion of UPOV has presented increased opportunities for breeders based in the European Union.

Older UPOV Members: Other Countries

An overview of developments with regard to the other 10 older UPOV members (Australia, Canada, Hungary, Israel, Japan, New Zealand, Poland, South Africa, Switzerland, and USA) which were UPOV members by 1992, is provided in Fig. 7. In a manner similar to developments for the European Union, this group of countries has also seen an increase in the number of applications received, particularly from non-residents as well as an increase in the number of applications made by their breeders in other territories.

Newer UPOV Members

With regard to countries which have joined UPOV more recently, it is possible to consider the impact which became apparent immediately on joining UPOV, or soon thereafter. The majority of countries which joined UPOV between 1993 and 2000 and, therefore, for which it has been possible to obtain...
useful data, were countries in transition to a market economy (Bulgaria, Czech Republic, Estonia, Kyrgyzstan, Republic of Moldova, Russian Federation, Slovakia, Slovenia and Ukraine) or were Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Panama, Paraguay and Uruguay). An overview of developments in those two categories is provided below. Of the remaining seven countries which joined UPOV between 1993 and 2000 (Austria, China, Finland, Kenya, Norway, Portugal and Trinidad and Tobago), China and Kenya were the subject of individual country profiles in the impact study.

An overview of the 10 Latin American countries which joined UPOV between 1993 and 2000 is provided in Fig. 8. It is apparent that joining UPOV was characterized by a substantial demand for variety protection and, in particular, a large influx of foreign varieties (applications by non-residents). A high proportion of non-resident applications relate to ornamental varieties. In that regard, it can be observed that access to such varieties is important to enable producers in those countries to meet the demands of the global market place and also that the lack of an effective and internationally recognized PVP system can act as a barrier to global trade.

An overview summary of the countries in transition to a market economy which joined UPOV between 1993 and 2000 is provided in Fig. 9. It is apparent that joining UPOV was accompanied by a substantial demand for variety protection, with the majority of applications made by domestic breeders.

The results demonstrate that joining UPOV was accompanied by a strong demand for protection of new varieties of plants, both in Latin American countries and countries in transition to a market economy. The nature of the demand differed between the two sets of countries, with a particularly high demand for ornamental varieties from non-resident breeders in Latin America, in contrast to a higher demand from resident breeders in countries in transition to a market economy. This picture highlights the fact that an effective PVP system responds to the circumstances in the territory concerned and provides benefits where these can be obtained. The individual country reports illustrate further different ways in which the benefits may be manifested.

**Evolution of the use of PVP in the Asia Pacific Region**

The development of PVP in the Asia Pacific region provides an opportunity to observe the evolution of the use of PVP by breeders over time. The graphs in Fig. 10 are presented in the order in which those countries became UPOV members: New Zealand (1981), Japan (1982), Australia (1989), China (1999), Republic of Korea (2002) and Viet Nam (2006). No applications have yet been received in Singapore.

In case of China, Republic of Korea and Viet Nam, which are new UPOV members, it is observed that first use of the system is by residents for domestic applications. Applications from non-residents followed later and increased with time. Japan has been a member since 1980 and it is possible to see the same pattern; the first impact is of domestic Japanese breeders making use of the system followed by applications by non-residents (foreign breeders). The consequent step, which can be seen in the graphs for
Australia, Japan and New Zealand, is that breeders from those countries then start to make applications in other UPOV member countries (foreign applications). In case of China and the Republic of Korea, it can be seen that this stage has also been reached.

Reports on Studies Conducted in Individual Countries

It is apparent that the impact of PVP is expected to vary country-by-country and crop-by-crop. Accordingly, although substantial benefits have been seen across the range of UPOV members and, in particular, in each of the countries in this study, the results and conclusions of the study need to be seen in the context of individual situations. The impact study provides information on individual country studies in Argentina, China, Kenya, Poland and the Republic of Korea. The impact study produced a number of findings concerning the impact of PVP, which may be summarized as follows:

Breeding Activity and Structure of the Breeding Industry

The introduction of the UPOV system was associated with increased breeding activity and with the encouragement of new types of breeders, including private breeders, researchers and farmer-breeders. The introduction of PVP was also associated with the development of partnerships, including public-private cooperation.

Improved Varieties

Individual country reports in the impact study confirmed that the introduction of PVP was associated
with the development of new, protected varieties that provided improvements for farmers, growers, industry and consumers.

**Increased Number of New Varieties**

The impact study provided information on how the number of new varieties increased after the introduction of PVP. It also demonstrated that membership of UPOV was associated with an increase in the number of varieties introduced by foreign breeders, particularly in the ornamental sector.

**Development of International Markets**

One of the benefits of PVP is to encourage development of new, improved plant varieties that lead to improved competitiveness in foreign markets.

**Enhanced Access to Foreign Germplasm**

In addition to providing improved competitiveness for farmers, growers and industry, access to foreign plant varieties is an important form of technology transfer that can also lead to enhanced domestic breeding programs as a result of the breeders’ exemption.

**Conclusion**

The PVP system established by the UPOV Convention provides a legal framework for the protection of intellectual property rights in the field of plant breeding. The framework and the key requirements for PVP set out by the UPOV Convention have provided an internationally harmonized approach for UPOV Members. That harmonized approach which enabled cooperation among UPOV members has established it as an effective system of responding to the challenges of a changing world. Many observer countries have initiated the procedure of acceding to the UPOV Convention.

**References**

2. In this article the term ‘commercialization’ is used to cover the acts included in Article 14(1) to (4) of the 1991 Act of the UPOV Convention.
3. Article 14 relates to ‘scope of the breeder’s right’.
5. Article 15(1) of the 1991 Act of the UPOV Convention.