

A Guide to Intellectual Property





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**Innovation
is key to
success.**

1. Farmers need innovation

Ever since humans began domesticating wild plant species some 10,000 or so years ago, innovation has been key to farming. Working with the uncertainties of nature, humans began by finding, selecting, and domesticating plants that best met their needs for food, fuel, fibre, and more.

In the beginning, they worked with genetic diversity available in the wild. Then they began to save seeds for the following season, and exchanged seeds and plants with other farmers too. They selected and developed crops that were best adapted to their own specific regions, soils, and climates. Eventually they developed new varieties of wheat, rice, and maize, the three most important crops for feeding humankind today.

With time, farmers learnt to innovate even faster. More than 150 years ago, scientists such as Charles Darwin and Gregor Mendel discovered how plant species passed genetic information from one generation to the next. Since then, the pace of change has accelerated.

Today, the plant breeding process has become more professional and technical, but the spirit of innovation is as important as it ever was. Farmers face the growing challenges of population growth and climate-related risks, including pests, disease, and extreme weather events such as drought. Plant breeders support these farmers by developing new varieties that allow the farmers to produce more food, more consistently, with less resources such as fertile land and water. Plant breeders also help by offering greater choice, so that farmers can select the varieties best adapted to their local needs.



2. Intellectual Property rights protect innovation, benefit plant breeders and society alike

Some of the first known references to intellectual property date back to ancient times. In the Greek colony of Sybaris (500 BC), for example, chefs were awarded year-long monopolies for their dishes. More than two hundred years later, the judge on a poetry contest in Alexandria exposed and denounced the plagiarism of poets who used words and phrases written by others. Right from the beginning, IP protection was used to benefit society.

More than two thousand years later, intellectual property now includes patents, trademarks, trade secrets, and more to provide added value to society.

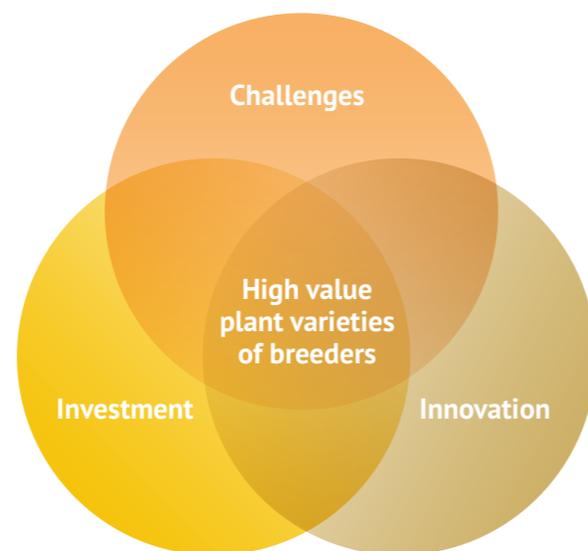
This value comes from balancing the benefits to inventor and to society. Intellectual property rights protect the inventor by providing an exclusive right to commercialise the innovation for a given amount of time. This provides a way to recover the initial investment and reward the innovator. At the same time, intellectual property rights also secure for society the innovation and associated knowledge, sometimes for others to improve. This balance feeds a virtuous cycle of innovation that provides major benefit to society.

This holds true for plant breeders too. Breeding new plant varieties is an expensive and time-consuming business. It takes technology, expertise, money, and sometimes as many as ten years to develop a new variety. But the innovation needs protection, since the new varieties are often easy to copy.

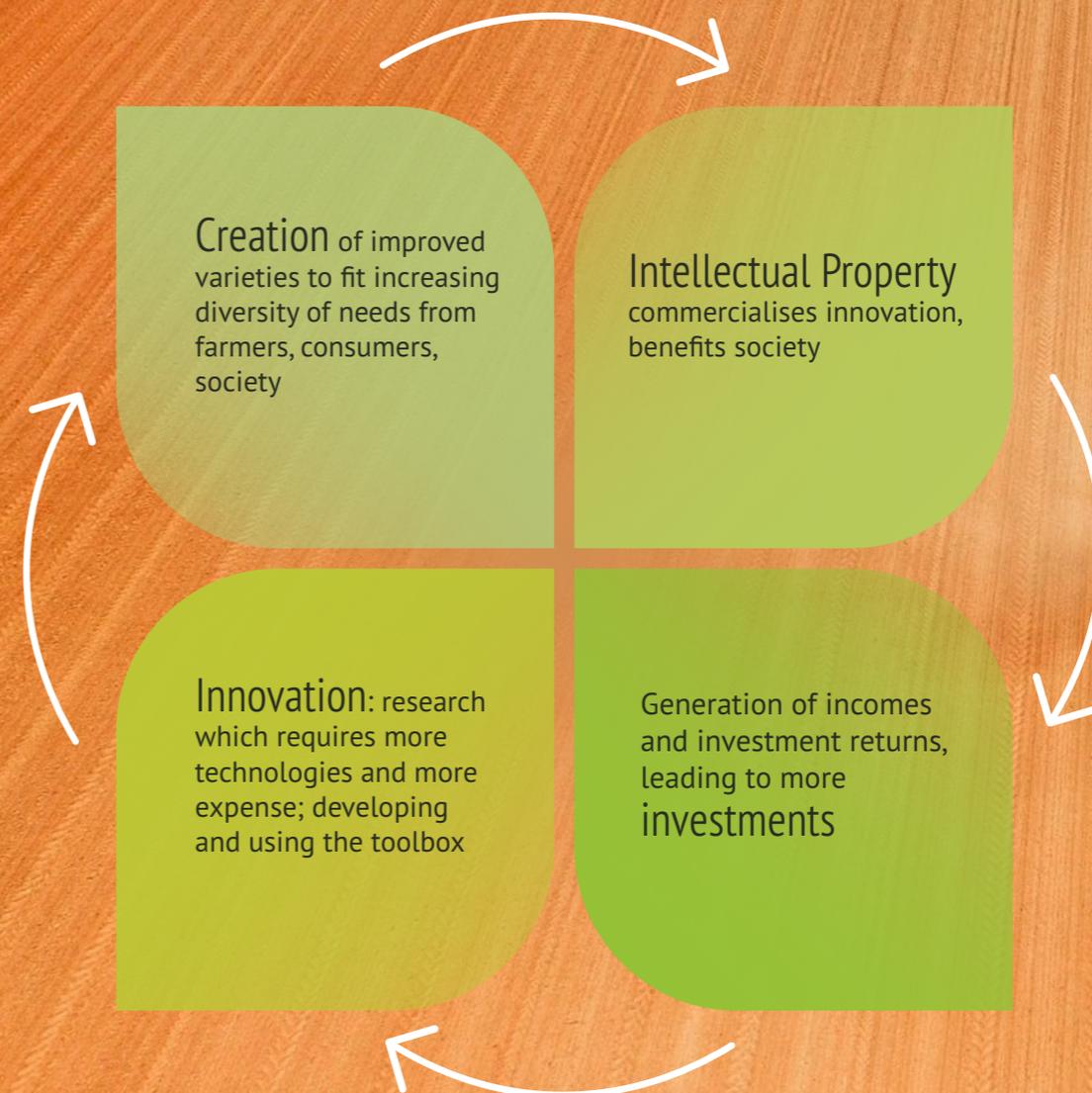
With IP rights, plant breeders can receive a fair remuneration from growers who use the improved variety, at least for a limited period of time. The plant breeders are therefore better able to recover their costs thereby rewarding and encouraging further investments. Meanwhile, society benefits from improved plants and can reuse the knowledge for further improvements.

Creation of new plant varieties needs incentives

IP allows a fair return on investment and stimulates innovation



The Innovation Cycle





3. The different IP tools

Breeding companies can use different IP tools to protect their creations. Choice of IP tool will depend on company strategy and on the strengths and weaknesses of the different tools. The scope of IP tools is not limited to this table.

	Plant Breeders' Rights (PBR)	Patents	Trademarks ^{TM/®}	Trade secrets	Contracts
SCOPE	Protects new varieties of plants.	Protects inventions: products and processes.	Protects brand names and logos on goods and services. Distinguishes goods and services of one enterprise from another.	Protects devices, strategies or other information that is confidential and exclusive to the company. This information is a competitive advantage.	Protects secrets, processes, methods, and information. Usually used for seed multiplication, production, commercialisation, licencing and even use of Farm Saved Seeds.
AGENT OF PROTECTION	UPOV AND PVP offices at the national/ regional level. Protection is administered via 76 UPOV Members. Enforcement at the national level.	Protection administered at national and regional level.	Registered at national and regional level, or at international level via WIPO. Registration provides legal certainty.	Trade secrets are protected without registration or procedural formalities.	Contracts place legal obligation on employees or any party to keep data and procedures secret.
CRITERIA	Conditions for PBR are: Novelty, Distinctness, Uniformity, Stability.	Novelty. Inventive step. Industrial applicability. Enabling disclosure.	Trademark is a word, combination of words, letters, numerals, drawings, symbols, shapes, packaging, or non-visible signs such as sounds, fragrances, or colours distinguishing features. Possibilities are almost limitless.	In general, trade secrets must be commercially valuable and known only to a limited number of people. Rightful holder takes reasonable steps to keep the information secret.	A contract's basic elements are: mutual assent, expressed by a valid offer and acceptance, adequate consideration, capacity, and legality.
ACCESS BY THIRD PARTIES	UPOV balances protection with free access for any third party who wishes to breed further and develop new improved varieties: the breeders' exemption.	Patent owner can decide who is allowed to produce, sell, import the invention in the countries where a valid patent is owned.	Trademark can be exclusively used by its owner, or licensed to another party in return for payment.	The holder of a trade secret has the right to authorise a third party to access and use the trade secret information.	Prevents use of the product by competitors or public not parties to the contract.
PROTECTION PERIOD	Protection generally lasts 20-25 years.	Protection lasts about 20 years.	Protection varies and is endlessly renewable, but usually lasts 10 years.	Protected for an unlimited period of time.	Specified in the contract
COSTS	Reasonable cost.	Can be expensive.	International protection costs around US\$ 700, plus additional costs depending on place of registration.	No costs, but associated precautions and security may be costly.	Easy, low cost.



4. UPOV: Plant breeders' rights

In the years after World War II, as international political and trade relationships were shifting and countries were looking for food sovereignty, interest was growing in the use of intellectual property rights to increase food production. Plant breeding required a specific IP tool, because of the self-producing nature of plants. In 1961, at the request of breeders, governments came together in Paris to adopt the International Convention for the Protection of New Varieties of Plants (UPOV Convention).

The UPOV Convention - which was later revised in 1972, 1978, and 1991 - grants the breeders of new plant varieties an intellectual property right: the plant breeder's right.

Plant breeders' rights (PBR) balance protection as an incentive for innovation with access enabling others to further improve plant varieties. Anybody can be a plant breeder with the right to claim PBR.

To qualify for plant variety protection, the new variety must be:

- D - Distinct from other varieties;
- U - Uniform in its characteristics;
- S - Stable.

With a unique denomination

Plant Breeders' Rights (PBR) balances protection of IP rights with accessibility for the rest of society. PBR allows the following use of protected varieties:

- to breed other varieties (this is called the "breeder's exemption")
- for experimental purposes
- for private and non-commercial purposes, for example, by amateur gardeners or subsistence farmers.
- for farmers to save seed, the farmer's exception (or farm saved seed) is an optional exception that members of the UPOV 1991 Act can put in place to allow farmers to save part of their harvest from protected varieties for replanting next season, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder (usually a royalty collection).

ISF considers the UPOV Convention the most appropriate IP tool for plant breeders. With an observer seat and as representative of private breeders in technical and legal discussions at UPOV, ISF plays an influential role in the constant evolution of the UPOV Conventions.

5. Focus on: Essentially Derived Varieties (EDVs)

What's an EDV?

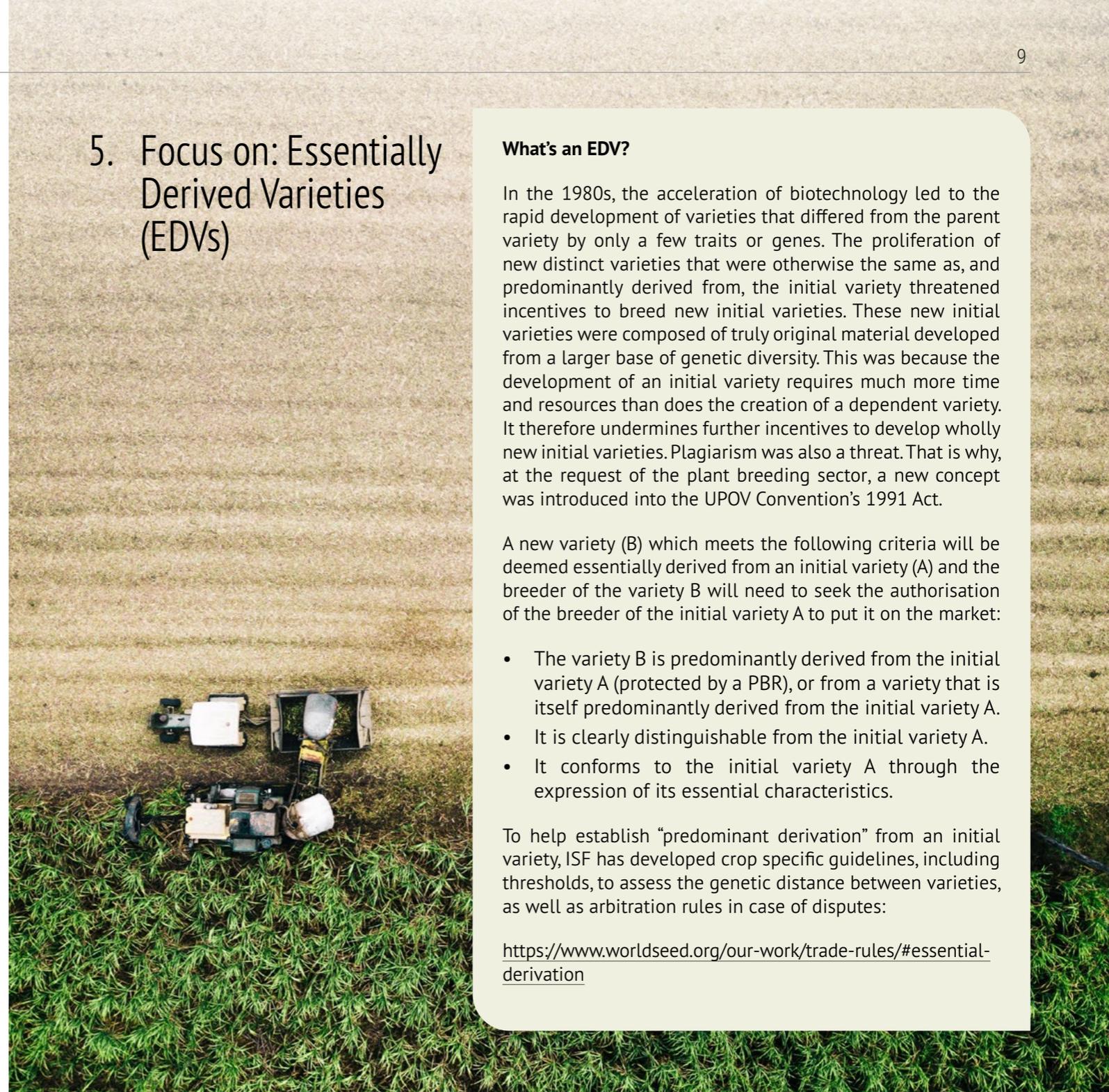
In the 1980s, the acceleration of biotechnology led to the rapid development of varieties that differed from the parent variety by only a few traits or genes. The proliferation of new distinct varieties that were otherwise the same as, and predominantly derived from, the initial variety threatened incentives to breed new initial varieties. These new initial varieties were composed of truly original material developed from a larger base of genetic diversity. This was because the development of an initial variety requires much more time and resources than does the creation of a dependent variety. It therefore undermines further incentives to develop wholly new initial varieties. Plagiarism was also a threat. That is why, at the request of the plant breeding sector, a new concept was introduced into the UPOV Convention's 1991 Act.

A new variety (B) which meets the following criteria will be deemed essentially derived from an initial variety (A) and the breeder of the variety B will need to seek the authorisation of the breeder of the initial variety A to put it on the market:

- The variety B is predominantly derived from the initial variety A (protected by a PBR), or from a variety that is itself predominantly derived from the initial variety A.
- It is clearly distinguishable from the initial variety A.
- It conforms to the initial variety A through the expression of its essential characteristics.

To help establish "predominant derivation" from an initial variety, ISF has developed crop specific guidelines, including thresholds, to assess the genetic distance between varieties, as well as arbitration rules in case of disputes:

<https://www.worldseed.org/our-work/trade-rules/#essential-derivation>





Focus on: The benefits of UPOV Membership

When countries become a member of UPOV they acquire a wide range of benefits. These include:

- increased plant breeding and more new varieties available,
- better choice of plant varieties including adapted varieties developed in other countries,
- improved crop characteristics,
- enhanced domestic breeding programmes,
- increased competitiveness for breeders and farmers on foreign markets.

To support uptake of UPOV Membership, ISF has partnered with four other organisations – UPOV, ISTA, OECD, and WFO – in the World Seed Partnership (WSP), an initiative to support development of the seed sector around the world. By making sure that farmers have access to high quality seed and suitable new plant varieties, the WSP supports food security and economic development, including in developing countries.



Kenya

Kenya's rose industry flourishes with UPOV membership

In Kenya, UPOV membership has facilitated the emergence of a new economic sector, the horticulture industry. Since joining UPOV in 1999, Kenya's exports of cut flowers grew from US\$ 57 million in 1998 to US\$ 546 million in 2013. Twenty years after joining UPOV, Kenya's flower industry provides incomes for more than 500,000 people and accounts for about 38 percent of cut roses sold in the European Union.¹

¹ Sources: UPOV video ([link](#)) and Kephis 2017 presentation ([link](#))



Colombia

Intellectual property rights sweeten Colombian sugar

In Colombia, UPOV membership since 1996 has generated a virtuous cycle of innovation and investment. Colombia's sugarcane research centre, Cenicaña, has been able to reinvest its royalties, to innovate more, and to develop better varieties. This boosts Colombia's sugar productivity and protection from pests and disease.



Vietnam

IP rights boost rice, maize, and sweet potato

In Vietnam, UPOV membership since 2006 has encouraged more plant breeders to develop new plant varieties better suited for local conditions. Increased plant breeding has seen more IP applications, more crop varieties, and higher yields. For the first ten years after membership, the three main crops – rice, maize, and sweet potato – enjoyed average yield increases of 1.7, 2.1, and 3.16 percent per year.



6. Acting against illegal practices



In recent years, there has been an increase in illegal seed practices, including counterfeit seeds, fake seeds, fraudulent labelling, intellectual property infringements, regulatory offences, trademark infringements and thefts of proprietary material. In some countries, recent years have seen illegal or counterfeit seed account for more than 50 percent of crop seed sold to farmers.¹

Those who use illegal seed practices are misleading and exploiting farmers. They place farmers' livelihoods and families at risk and decrease the overall capacity of sustainable food production. Continued sales of illegal seeds threaten farmers' confidence in the seed sector. In such cases, farmers may not receive important supporting benefits from seed producers and suppliers, such as crop production advice.

Illegal seeds can damage the reputation and economic prospects of an entire agricultural region or key national commodity. It also discourages the continued investment by breeders and seed producers to develop, produce and deliver better quality seeds.

¹ World Bank. 2017. Enabling the Business of Agriculture 2017. Washington, D.C: World Bank. doi:10.1596/978-1-4648-1021.





7. Questions and Answers



Is there a contradiction between the UPOV Convention and the International Treaty on Plant Genetic Resources for Food and Agriculture (IT PGRFA) which guarantees Farmers' Rights?

No, the two conventions are both important and complementary for plant breeders.

The 2001 International Treaty on Plant Genetic Resources for Food and Agriculture (IT PGRFA) promotes the conservation of plant genetic resources, that are part of the breeding process to produce new and improved varieties able to meet tomorrow's agricultural challenges.

The UPOV Convention provides plant breeders with protection for their intellectual property, thereby generating the incentives for innovation.

For more information, please see the 2018 ISF position paper on Farmers' Rights / Farmers' Exemption: a clarification.



Does UPOV benefit the public or private sector?

Both public and private sectors benefit from PBR systems, which can even facilitate public/private partnerships for plant breeding. The introduction of PBR systems in developing countries stimulates commercial breeding in domestic public research institutes and increases the number of locally bred varieties.



What size of farm does UPOV benefit?

UPOV was set up to benefit small, medium, and large-scale farmers alike. The introduction of UPOV in a country leads to an increase of high-quality and improved germplasm, which benefits all farmers.

**Can farmers cross their own local varieties with PBR-protected varieties?**

Yes, under the UPOV Convention, the Breeder's Exemption allows farmers to use a protected variety for the purposes of breeding another variety.

**Are farmers beholden to the seed sector as a result of PBR systems?**

No, PBR systems give farmers the options to choose varieties that suit their farm best. This choice helps farmers to become more resilient and more responsive to challenges, such as changing climates. In addition, only a small portion of varieties are subject to IP rights, as the table shows below:

Crop	National Listing (NLI)	Under Plant Breeder's Rights (PBR)	Plant Patents (PLP)	Other	% PBR/NLI
Wheat	33170	14396	109	5289	43
Maize	73829	22065	572	32984	30
Lettuce	13984	7352	0 (tbc)	86	53
Tomato	18578	4483	9	570	24
Pepper	12144	2418	24	240	20
Carrot	4157	570	0	73	14

**When breeders place intellectual protections on their varieties, are they ignoring their benefit sharing obligations under the IT PGRFA and CBD's Nagoya Protocol?**

No, the breeders need the intellectual protection in order to produce their new varieties. In addition, the protection is temporary and expires usually after a few years. When breeders produce improved varieties, then these improved varieties eventually lose their protection and are available to all for use. The benefits are therefore shared.

For more information on Access and Benefit Sharing obligations, please refer to the [ISF Guide on Genetic Resources](#).



8. Glossary

Access and Benefit Sharing (ABS) refers to the concept that access to genetic resources can be explicitly linked with benefit sharing. ABS is the CBD's third objective.

Benefit sharing – giving a portion of advantages (benefits) / profits derived from the use of genetic resources to resource providers.

Breeder's Exemption is the exemption whereby users do not have to pay for use of a protected variety to breed a new variety.

Breeders' Rights refer to the intellectual property rights of persons (i.e. breeders/farmers) who breed, discover and develop new varieties of plants (provided that the variety is new, distinct, uniform and stable - Art. 5, UPOV Convention, 1991).

Contract is a written or spoken agreement, enforceable by law.

Convention on Biological Diversity (CBD) is an international treaty with three core goals: the conservation of biological diversity, the sustainable use of the components of biological diversity, and the fair and equitable sharing of benefits that arise from the utilisation of genetic resources. The CBD entered into force in 1993.

DUS – Distinctness, Uniformity, and Stability – These are the three conditions for a new variety to be eligible for PBR protection.

Essentially Derived Varieties (EDV) – A variety, which is distinct and predominantly derived from a protected initial variety, while retaining the essential characteristics of that initial variety. The commercialisation of an essentially derived variety needs the authorisation of the title holder of the initial variety.

Farmer's Exemption refers to the provision under UPOV 1991 by which farmers can use saved seed of a protected variety on their own holdings, "within reasonable limits and safeguarding the interests of the breeder".

Farm saved seed (FSS) are those seeds or other reproductive plants (eg tubers), which are saved after harvest to produce and reproduce the variety

IT PGRFA is the International Treaty on Plant Genetic Resources for Food and Agriculture, which came into force in 2004. Over 140 countries are party to the IT PGRFA.

Plant Breeders' Rights (PBR) – See Breeders' Rights

Plant variety is a unit of botanical classification with a more precisely defined group of characteristics than a species.

Plant Variety Protection (PVP) is the legislation granting intellectual property rights to new varieties of plant.

Plant Variety Rights (PVR) – also known as plant breeder's rights – are the rights granted to the breeder of a new variety of plant.

Trademarks are intellectual property consisting of a recognisable sign, design, or expression which identifies products or services of a particular source from those of others.

Trade secrets are a type of intellectual property that have economic value because they are not generally known or discoverable by others.

UPOV Convention is an international agreement adopted in 1961 to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new plant varieties for the benefit of society.

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