
COLLECTION
SYSTEMS
FOR ROYALTIES
IN WHEAT AN
INTERNATIONAL
STUDY



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Abstract

This project has been carried out by a Working Group comprised of members of the Field Crops Section of the International Seed Federation. Results are freely available to all ISF members and UPOV member countries to enable a comparison of the effectiveness of different Intellectual Property (IP) protection mechanisms and royalty collection systems.

The International Union for Protection of New Varieties of Plants (UPOV) provides a legislative framework and is the most widely used sui generis system for the protection of breeders' IP in varieties they have created. These laws allow breeders to collect royalties in return for the use of their varieties, which funds further research and the development of new, improved varieties.

Breeders in different countries adopt diverse systems for the collection of plant variety royalties. These may be collected at any suitable stage of the crop production cycle, but IP owners typically make the collection at the earliest reasonable stage of distribution.

Current legislation, structure of the seed business and prevailing farming practices in each country have an important influence on the type and effectiveness of the local royalty collection system. This study reviews the various mechanisms for protecting IP in plant varieties, analyses the different systems for collecting royalties arising from plant variety protection laws and considers the legal, political and practical farming factors that influence the efficiency of the royalty collection process. Market data from 14 states have been assembled by members of the Working Group. The present study is limited to wheat and attempts to relate the efficiency of royalty collection in each state to the prevailing IP protection mechanisms, enforcement tools and other measures in place. The relationship between the efficiency of royalty collection and the number and type of IP protection mechanisms and enforcement measures in place is analysed for each state included in the study. A discussion of the results and key influencing factors is presented for each territory examined.

1. Introduction

The Concept of Intellectual Property in Seed

Research and development work in small grained cereals needs sufficient funding to be innovative. This can be done in a number of ways. Typically, in developed areas of the world, plant breeding is not considered to be fundamental research and is therefore funded largely by the private sector. In Europe, for example, new varieties are almost exclusively developed by private sector plant breeders who fund their research projects and their shareholders' interests by collecting 'royalties' in return for the use of their intellectual property. In some other parts of the world, notably North America, the majority of small grain cereal programmes are publicly funded, whilst the Australian plant breeding industry appears to be in a transitional phase, during which public funds and private investment both have significant roles to play. The present situation in Asia is strongly influenced by the prevailing legislation in each state, as not all countries are signatories of the UPOV convention.

Interesting trends can be discerned when comparing the rate of variety improvement in territories where royalty collection systems are well established (and consequently plant breeding is a competitive industry) with countries where breeding is still largely funded from the public purse (see Fig. 1). Whilst published data for barley, oilseeds and grain legumes is scarce, the trend is well illustrated with reference to wheat. In the European Union, where private sector wheat breeding is a competitive business, yield improvement is more rapid.

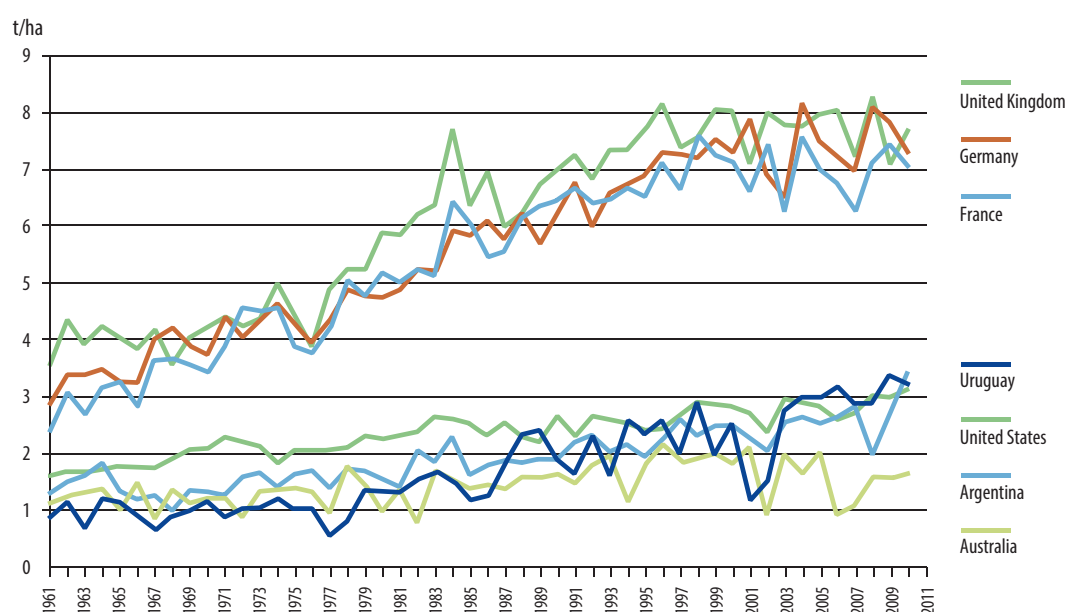


Fig. 1- Comparison of rate of increase in wheat yields in selected countries. (FAOSTAT |© FAO Statistics Division 2012)

Whilst the contribution of advances in agronomy to increases in yield is well documented, good evidence exists that most of the increase is due to genetic effects (McKay, 2010). In the United States, however, the introduction of plant variety protection (PVP) may have stimulated public (not private-sector) investment in wheat varietal improvement, but PVP does not appear to cause any measurable increase in experimental or commercial wheat yields (Alston & Venner, 2002).

The present study does not attempt to relate the rate of variety improvement to the introduction and enforcement of PVP in any given state or country, but instead indicates that such legislation needs to be underpinned by an infrastructure of enforcement tools and incentives that enable the holder of intellectual property rights in a plant variety to collect adequate royalties in return for use of that intellectual property.

2. Mechanisms for Protection of Breeders' Rights in Plant Varieties

The principal objective of the present study is to analyse the effectiveness of royalty collection systems that are based on the UPOV principle of PVP, or so called Plant Breeders' Rights (PBR). In addition, alternative methods of protecting IP in plants and plant varieties are listed and described.

Broadly speaking, there are five mechanisms that provide the basis for claims to intellectual property rights in a plant variety, whilst a sixth method, that of using a Registered Trademark, is considered to have potential for use in the industry. The existence and enforcement of these mechanisms have been examined in the 14 territories studied in the present review. The basic mechanisms in use are as follows:

2.1. Plant Breeders' Rights (PBR) or Plant Variety Protection (PVP)

This is the standard method of protecting plant varieties in the majority of jurisdictions. The legal framework for the implementation of PBR in any given country or state is provided by the International Union for the Protection of New Varieties of Plants (UPOV). Currently, 70¹ countries are members of UPOV and each one has allowed its seed laws to be scrutinised by UPOV before being invited to become a member of the Union. Each member state therefore has adequate and largely uniform legislation in place to support a plant breeding industry. In addition to the UPOV Convention, countries that are members of the World Trade Organisation (WTO) are bound by their membership to adhere to the International Agreement on Trade-Related Aspects of Intellectual Property (TRIPs). This agreement sets out the minimum amount of protection that member countries must provide for intellectual property, including the introduction of an effective *sui generis* system for plant varieties if these are excluded from patent protection.²

From the date of granting of PBR until its expiry (normally 20 years, but depending on which UPOV convention has been ratified in the territory in question³) the holder of rights is granted sole and exclusive rights over the multiplication and commercialisation of his variety. This in theory allows the breeder to recover the research and development costs associated with breeding and introducing the variety, thereby providing an incentive for individuals or companies to invest in plant breeding. Upon expiry of the period of protection the variety passes into the public domain.

In order to qualify⁴ for a grant of PBR, a variety must be morphologically 'distinct' from any other variety in common knowledge; 'uniform', meaning that it shall be sufficiently uniform in its relevant character-

¹Status on December 8, 2011.

²Article 27.3(b), TRIPs agreement.

³Article 8(1), International Convention for the Protection of New Varieties of Plants, Act of 1961, set the period of protection to a minimum of 15 years for field crops, and so does Article 8 of the 1978 Act, whereas the minimum duration of the breeder's right has been extended to minimum of 20 years for field crops in the Act of 1991 (Article 19(2)).

⁴Article 5(1), International Convention for the Protection of New Varieties of Plants, Act of 1991.



istics; and 'stable', indicating that it can be faithfully and consistently reproduced by the breeder, his sub-license holders, and by growers who have bought reproductive material of the variety. To qualify for protection, a variety must also be demonstrably novel, as the purpose of protection is not to include native varieties or landraces collected from the wild, and have a name.

Within the scope and period of protection, compulsory exceptions exist in the rights of the holder of a PBR grant under the UPOV Convention of 1991, of which the so called 'Breeders Exception' is considered by the breeders' community to be of utmost importance and value in the creation of improved varieties. This exception allows other plant breeders to use the protected variety within their own breeding programmes, provided the resulting variety is substantially different from the parent material. In addition, there is an optional exception: the so called 'Farmers' Exception'. This refers to the right of farmers to save part of their harvest to use for propagating purposes on their own holdings,⁵ such seed being commonly referred to as 'Farm-saved Seed' (FSS). This optional exception may be introduced in the national legislation 'within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder',⁶ thus providing a legal platform allowing breeders to set up systems for collection of a royalty for the use of such Farm-saved Seed.

However, offering such seed for sale to a third party would constitute a breach, not only of the breeders' rights, but also of the prevailing seed laws in most countries.

The precise nature of PVP legislation in force in a UPOV member country will dictate whether or not plant breeders or their agents in that country have the necessary legal means to enable the collection of royalties on FSS. In certain countries (for example the United Kingdom, Finland, Sweden, Denmark and France) FSS, like certified seed, is indeed subject to a royalty collection system.⁷ In the United Kingdom, Finland, Sweden and Denmark, farmers are contacted directly by the breeders' associations or collection agencies and asked to make a declaration of their use of FSS. In France, farmers are automatically charged a FSS levy at the point of marketing their grain, but this is refunded if they can produce receipts to prove that they purchased certified seed.

In general, UPOV member states that have adopted the 1991 revision of the Convention have made use of the provision therein to exercise breeders' rights over FSS. Although the 1978 Convention gives no firm consideration on how to deal with FSS, most signatories that have not yet adopted UPOV 1991 still allow farmers to use their own seed free of charge. However, this is not the case exclusively, as in the Republic of Ireland, a state that was still using the 1978 version of the UPOV Convention until 2011, the Minister of Agriculture filed a 'Statutory Instrument' (interpretation of the law) which enabled breeders and their agents to collect a royalty on FSS before the adoption of UPOV 1991 (*PVDO, undated*).

2.2 Patents on Novel Genes, Traits, Processes or Plant Varieties

In most countries, living organisms including plant varieties and their products (e.g. seed) are not eligible for a grant of patent rights. However in some countries, including the United States, Australia and Japan, the law provides for owners of plant varieties to protect their inventions with patents.⁸

⁵Article 15(2), International Convention for the Protection of New Varieties of Plants, Act of 1991.

⁶*Ibid.*

⁷Further details, such as species covered by the royalty collection systems, are given in the results section of this report, as this may differ between countries.

⁸In the United States and Japan this form of patent is known as "Utility Patent" whereas in Australia plant varieties are covered by the so called "Standard Patent".



In Europe, plant varieties are not patentable. However if a plant variety carries a trait that is characterised by a novel gene or transgenic event, the gene or event is no more than a single characterising feature of the variety and plants containing it may be patentable under the European Patent Convention.⁹ Specific varieties carrying the patented trait may also be protected by PVP.

In the United States, any living organism that is the product of human intervention (including a plant variety) is patentable (*USPTO, 2012*). Only human beings are excluded. The patents that may be awarded to protect plant varieties of seed propagated varieties in the United States are known as Utility Patents in order to distinguish them from Plant Patents for asexually reproduced plants. They correspond to the standard patents that are allowable in other parts of the world. However, the rights afforded to patent holders are substantially similar in all three cases.

Plant variety Utility Patents are routinely granted in the US for approximately 95 per cent of applications.¹⁰ This success rate differs markedly from that in Australia and Japan, as the criteria for the award of patent rights are different in the three countries. In the United States, a patentable invention must be demonstrated to be 'non-obvious' in nature, and the US legal system recognises that selection of an individual plant variety from a segregating population satisfies the criterion of non-obviousness. In Australia and Japan, however, the criteria for award of patent rights dictate that the invention (variety) must show an inventive step, and products resulting from conventional plant breeding techniques are typically not considered qualifying in this respect. The award of Utility or Standard Patents on plant varieties in Australia and Japan is therefore extremely unusual. In most technical fields, the criteria of 'non-obviousness' and 'inventive step' are considered equivalent: the difference in approach in the plant breeding industry is unusual.

From the date of granting of a patent or utility patent until its expiry, the patent holder has exclusive rights to exploit the invention or to license others to do so. In addition, the holder has the right to exclude all others from making, using, selling or importing the protected invention. In some jurisdictions, including the United States, this includes the right to prevent others from using a patented variety as a parent in breeding programmes. The protection of intellectual property rights afforded by Plant Patents and Utility Patents in the United States does not allow either Farmer's nor Breeder's Exception in the same way as PVP legislation does. However some European states, including France, Germany, Belgium and Switzerland have already introduced patent laws that allow a research exception, similar to the principle of the Breeders' Exception. Under this exception, derived varieties may not contain the patented element unless a license is obtained from the patent holder (*IPO, 2008*).

2.3 Use of Contract Law

Contracts are widely and frequently used in support of other forms of PVP. Typically, the strongest and most enforceable contracts are those that are underpinned by PBR legislation (*Ekvad, 2008*). Examples include contracts that oblige the grower of a variety to comply with specific terms required by the holder of rights (such as re-sale of the entire produce of a crop of a protected variety to an agent appointed by the holder of rights). Such contracts have proved invaluable in the enforcement of PBR. The present study has demonstrated that in territories where they are used routinely, the use of certified seed and the con-

⁹Article 53(b), European Patent Convention.

¹⁰A M Grunberg, USPTO, personal communication (2010).



comitant collection of seed-based royalty income are at a much higher level than in areas where these control measures are not used.

The use of contracts to capture downstream value whilst maintaining high levels of certified seed sales and control the use of resulting produce is well illustrated by the High Oleic / Low Linolenic fatty acid (HOLL) market for oilseed rape (canola) varieties. Whilst most varieties of oilseed rape are grown to produce commodity oils and meal, the market for HOLL varieties is controlled closely by the users of the end product (for example a fast-food chain) and the developers of the varieties.

Another way in which contracts are currently used in order to maintain sales of certified seed has been developed in the United States. Varieties protected by PVP and not by Utility Patents are normally open to the Farmers' Exception; however, some breeders have introduced a legally binding contract which permits the grower to purchase seed of the variety provided he signs an agreement not to save his own crop for use as seed. Such 'no plant-back' contracts are used in conjunction with PVP and 'Title 5' of the US Seed Law, which requires that seed sold by variety denomination must be a class of certified seed.¹¹ Contracts can also be used upon expiration of PVP and then as a means and incentive for maintaining a valuable variety in the market. The breeder will carry out maintenance breeding and sell seed for further propagation and sale under the provision of a royalty payment as agreed by written contract. This is, however, a weaker protection as the variety is in the public domain and anyone may setup a parallel system for continuation of the variety in the market, without the risk of infringing PBR.

2.4 Biological Mechanisms, e.g. Hybrid Crops

Hybridisation is widely used in the modern seed market as a means for achieving superior variety performance. Hybrid varieties are also well protected from unauthorised exploitation,¹² as the grower can only reliably access the benefits of the hybrid variety for one generation - and then only from purchased seed. Protection for hybrid varieties can be gained through the PVP and Utility Patent systems. For example, PVP laws may be used for protecting both the hybrid and its parent lines. Typically, parent lines are not marketed, but maintained as 'trade secrets' (see 2.5 below). This is an example of specialised plant breeding techniques providing an alternative to conventional methods of intellectual property protection, alongside delivering superior benefits of improved varieties to the farming community. Owing to the method of production, growers wishing to exploit the benefits of the hybrid variety must obtain new seed from the breeder for each cropping cycle.

2.5 Trade Secrets

Trade secrets exist widely in industry as a means of protecting proprietary inventions, the computer software business being one of the best known examples. Trade secrets have limited applications in the protection of plant varieties other than hybrids, but may be more suitable for protecting methods or processes of plant breeding, or for examples of knowledge or expertise that cannot be registered through

¹¹Dr James Wilson, Trio Research Inc, personal communication (2010).

¹²Under certain jurisdictions, such as the Community PVP in the European Union, the Farmer's Exception does not include [protected] hybrid varieties.



Patent or PVP systems. A current example of using secrecy to protect inventions in the plant breeding business is the practice of maintaining confidentiality regarding the precise nature of marker – trait relationships for use in marker assisted selection. The owner of a specific marker may prefer to maintain secrecy, as proceeding to patent protection would reveal the existence of this specific technological invention.

The major weakness of the trade secret as a means of protecting intellectual property is that it is only effective for as long as the secret is maintained. Protection of such secrets may be improved if they are used in conjunction with strong, legally binding contracts that oblige all interested parties to maintain the required level of secrecy. However, once the trade secret is no longer confidential, any contracts designed to maintain secrecy are invalidated when the invention becomes public knowledge.

2.6 Registered Trademarks

Trademarks (®, ™) are not widely used in the area of PVP in field crops, but examples exist where well thought-out trade mark protection strategies support varieties also protected by PVP or Plant / Utility Patent. The best examples are to be found in the fruit and ornamental plants industries where fruits or cut flowers of a particular shape / size / colour / flavour may only be distributed and sold in conjunction with a registered trade mark. Examples of this practice include the apple varieties marketed under the ‘SweeTango®’ and ‘Pink Lady®’ trademarks. In these cases, it is not the variety, but the fruit itself that is trade-marked, and is packaged, distributed and sold only when each fruit is individually labelled. This adds considerable value to the product and also has the advantage of being a strong brand visible to the consumer.

Good potential for the use of registered trademarks linked to strong branding exists in crop and food production as new added-value consumer traits are progressively brought to the market.



3. Tools for the Enforcement of Plant Breeders' Rights

The evidence collected in the current study indicates clearly that the presence alone of PVP legislation in a country is not enough to guarantee a return on investment in intellectual property for the holder of rights. Plant breeders in different countries adopt different attitudes to the enforcement of their rights and this leads to widely differing policies in the collection of breeders' remuneration from royalties. Enforcement tools include such measures as seed laws, obligations on farmers to provide information on seed they have saved, certification systems and penalties for evasion of royalty payments.

In the United States, where public plant breeding programmes still prevail in small grained cereal markets, development of new varieties have traditionally been funded by state governments with, until relatively recently, little attempt to collect variety royalties. In 1994, however, a new 'Seed Law' was introduced in the United States that gave the licensor of a PVP registered variety the legal right to stipulate (optionally) that any sales of that variety were only permitted at the certified seed level – that means the earlier practice of selling either 'bin-run seed' or 'variety not specified' became illegal for protected varieties. A good example of the use of this enforcement tool comes from the state of Kansas, where the state university breeding programme, KSU Research Foundation, has recently brought eight successful prosecutions to court against farmers who have knowingly sold uncertified seed of named varieties from the Research Foundation's programme.¹³

Seed certification systems provide a degree of transparency in the movement of seed of protected (and unprotected) varieties and, in many countries, sales of certified seed provide the basis for royalty collection by breeders. Very high levels of certified seed sales in certain countries lead to an excellent level of collection of royalties on proprietary varieties, notable examples being Sweden and Ireland, where between 65-80 per cent of cereal crops are sown using certified seed. In other states, intermediate levels of certified seed use are well supported by systems for collection of breeders' remuneration on Farm-saved Seed. In the United Kingdom, farmers are legally obliged to provide the breeders' society with a full breakdown of all seed saved for sowing on their own holding. They then have the choice of remitting their royalty directly to the breeder or, if applicable, making a payment to the breeder through the contractor that processed the farmer's own seed for him. The UK Farm-saved Seed royalty collection system is robustly enforced by the plant breeders, but prosecutions are seldom necessary as the level of compliance is high. This system leads to an extremely high efficiency of royalty collection in the United Kingdom in spite of the fact that most cereal markets are 50 to 60 percent bought (certified) seed and 40 to 50 percent Farm-saved Seed.

A number of other factors have been identified as being important in influencing the efficiency of royalty collection, including political intervention, financial incentives, agricultural industry structures and farming practices. Examples include the prevailing situations in Uruguay (political intervention / financial incentives), Poland (industry structure) and Australia (farming practices). The effectiveness of these factors is discussed in the Results section of this paper.

¹³Marcia Molina, Vice President, KSU Research Foundation, personal communication (2009).

	Mechanism	Specific use	Description / comments	Argentina	Australia	Canada	
						West	East
1	IP Protection Mechanism	PVP	Common to all UPOV countries	yes	yes (PBR)	no	
		PVP extended to FSS	Measures may vary from country to country				
		Standard or Plant Patent	Novel gene, trait or a process (Standard)	yes	yes	yes	
		Utility Patent	On a specified variety (Unusual)	no	yes	no	
		Contract	May be used to support PVP (e.g. bag tags, and/or a document signed by farmer when buying /receiving seed).			no	
			Is it underpinned by PVP ?	no	yes	no	
		Trade Secret	In use in territory? (eg breeding processes)				
		Trademark	Usually applicable to end-product	yes	no	yes	
2	Tools / laws for enforcement	Seed law	National Seed Law in place?	yes	yes (PBR)	yes	
		Other law(s)	1. e.g. farmer obligation to give data on FSS	yes	no	no	
			2. Any other (Please give details)				
			3. Any other (Please give details)				
		Certification system	Mandatory. (Illegal to sell uncertified seed)	yes	yes	yes	
		Certification system	Voluntary. (Seed can be sold without)				
3	Political will in territory	Penalties for evasion	Costs and / or damages	no	yes	no	
		Level of support for PVP		low	low	no	
		Farmers Unions' support	Agreements, collaboration	neutral / negative	neutral / negative	no	
4	Who enforces / supports PVP in the territory?	Small farmers exemption	Exempt from paying royalty on FSS	no	yes	no	
		Government enforcement	Official intervention?	yes	no	no	
		Government support	Tacit support by government.	no	no	no	
5	Economic factors	Private sector	Seed companies acting for themselves?	yes	yes	yes	
		Financial incentives	Participate in a premium programme	no	yes	no	
		Government intervention	Prevalence of public varieties?	yes	yes	yes	
6	Farm environment and practice	Tax benefit	As an incentive for certified seed				
		On-farm seed processing (mobile cleaning machines)	with contractor or end point collection = +ve	negative	negative	negative	
		Other factors	Please explain if required/necessary				
7	Biological tools	OP or line	= conventional varieties	yes	yes	yes	
		Hybrids (incorporating royalty in price)	Comments specifically for wheat at this stage please	no	yes	no	
		Added value / genetic gain	Qualitative assessment H, M or L please	M	M-L	M-L	
8	Tax benefit	Rebate to farmers	As an incentive for the purchase of Certified Seed; if yes, explain how it works		no	no	
			Equal for both large and small farmers?		no	n.a.	
9	'Certified' Seed Use	Includes voluntary schemes. Seed may not be certified by an official agency such as OECD or its national designated authority but it is legal. So the seed is royalty bearing		32%	10%	18%	40%
	FSS use	Estimated as % of total seed use		50%	85%	82%	55%
	Illegal Seed (brown bagging)	Estimated as % of total seed use		18%	5%		5%
10	Royalty collection %	certified	Is any cert. seed sold illegally (no royalty)	100%		100%	100%
		FSS	Total possible minus % evasion	33%		0%	0%
	Cost of collection %	certified	e.g. Retention by collection agency	0%		0%	0,0%
		FSS	e.g. Remuneration of processors	15%		0%	0,0%
	Remuneration Indicator			46,1%	0,0%	18,0%	40,0%

Table 1- Overview of the specific elements for Intellectual Property protection and supporting Royalty Collection systems in

Czech R	France	Germany	Italy	Mexico	Poland	Spain	Sweden	United Kingdom	United States			Uruguay
									East	Plains	PNW	
yes	yes/no	yes	yes/no	yes	yes	yes	yes	yes	no			yes
yes				no	yes	yes	yes	yes				
yes	yes	yes	yes	yes		yes	yes	yes				yes
no	no	no	no	no	no	no	no	no	yes			no
yes	no	no		yes/no	yes	yes	yes	yes				
	no	yes	yes	no	no	no	yes	yes	yes			yes
				no	yes		yes	yes				
yes	no	no		yes	no	yes	yes	no				yes
yes	yes	yes	no	yes	yes	yes	yes	yes	no			yes
yes	no	yes	no	no	yes	yes	yes	yes	yes			yes
		yes		no	yes		yes	-				-
				no			yes	-				-
yes	yes	yes	yes	no	yes	yes	yes	yes	no			yes
no				yes	no		no	no				
yes	yes	yes	-	yes	yes	yes	yes	yes	yes			yes
high	high	high	low	medium	low	low	high	high	high			high
neutral	positive	neutral	neutral / negative	A few	negative	neutral / negative	positive	positive	positive			neutral
yes	yes	yes	yes	yes	yes	yes	yes	yes	no			yes
no	no	no	no	yes	no	no	no	no	no			yes
no	no	no	no	yes	no	no	yes/no	yes	no			yes*
yes	yes	yes	yes	A few	yes	yes	yes	yes	yes			yes
no	yes	yes	no	no	yes		no	no	yes			no
no	no	no	yes	yes	no	no	no	no	no			yes
				no	no	no	no					
negative	negative	negative	negative	negative	negative	negative	positive	positive	negative			negative
negative				none								
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes			yes
no	yes	yes	-	no	no	no	no	no	no			no*
M	H	H	H	H	H	M	H	H	H			H-M
no		no		no	no	no	no	no				yes
n.a.		n.a.		yes		no	n.a.	n/a				no
62%	55%	43%	50%	89%	15%	20%	80%	55%	50%	20%	85%	45%
27%	45%	57%	20%	11%	55%	30%	20%	45%	50%	80%	15%	35%
11%		yes	30%	0%	30%	50%		0,0%		10%		
100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%
96%	90%	30%	0%	0%	18%	30%	90%	90%	0%	0%	0%	90%
0%	5%	0%	0%	10%	2%	8%	0%	1,2%	0%	0%	0%	12%
9%	2%	20%	0%	0%	30%	35%	20%	6,2%	0%	0%	0%	0%
85,6%	92,2%	56,7%	50,0%	40,1%	21,6%	24,3%	94,4%	92,3%	50,0%	20,0%	85,0%	71,1%

countries participating in the study.



4. Results of the International Study

Data collected on wheat from the 14 seed markets investigated during the study were presented by individual members of the Working Group, each representing one or more countries. In addition to each individual country report included here, the data are presented in summary form in Table 1. Individual country reports are presented in alphabetical order.

4.1 Argentina

Miguel Rapela, Executive Director, Argentine Seed-men Association (ASA), Buenos Aires, Argentina

4.1.1 General Introduction

The use of certified wheat seed in Argentina is estimated as 37 per cent of total seed planted by farmers annually. A further 40 per cent of seed used is believed to be Farm-saved Seed. The balance of 23 per cent is illegally produced and traded 'brown bag' seed. The level of brown bagging and FSS use is of concern to the Argentine Seed-men Association (ASA) and to the plant breeding industry in general. Breeders of self pollinated plant varieties in Argentina have designed strategies to overcome all kinds of abuse of protected intellectual property. The industry has formed non-profit private associations (for example: ARPOV, Argentine Association for the Protection of New Plant Varieties), with the aim of implementing systems to protect plant breeders' rights and produce a return on investment in plant breeding in Argentina. This industry-wide movement was born out of a lack of resources required to monitor and control the enforcement of plant variety protection and a need for modernisation of the relevant laws. ARPOV coordinates and facilitates the administration and implementation of an Extended Royalty System (ERS) for self-pollinated plant varieties in Argentina.

4.1.2 The ERS for Farm-saved Seed

The ERS is based on the recognition of intellectual property rights for genetic developments introduced by plant breeders. The legal basis of the ERS is provided by the Seed Act and the Civil Code. These laws establish a legal framework within which a binding license agreement may be executed between two parties: breeder (licensor) and farmer (licensee). The farmer signs a license agreement obligating him to respect and recognize the licensed intellectual property right and agrees to pay a royalty fee to the licensor as a consideration for the use of the intellectual property right.

The contractual mechanism adopted is known as the "public offer" and terms and conditions are published in newspapers. From the time that the farmer acquires seed of a protected plant variety, he accepts the terms and conditions defined in the license. The farmer pays the applicable Extended Royalty based on information on the quantity of FSS used given to the breeder by the farmer. The license agreement is renewed with every new seed multiplication or use of seed of a different protected plant variety.

The ERS has been operating in Argentina for around ten years. Acceptance has been slow, but steady: in both wheat and soybean markets, an increase in the area covered by the system of 1 per cent per annum has been observed, until 2011, when the increase was almost 3 per cent.



4.1.3 Problems affecting the ERS

The main problem affecting the success rate of the ERS is the lack of legal capacity within ARPOV to enforce the law. The responsibility of complying with the contract therefore becomes dependent upon honesty of the individual licensees. A further problem is related to education: many wheat and soybean farmers still believe that the right to use FSS freely is conferred by law and is not limited by time, volume or surface area. This misconception will take time to change. The greatest successes of recent years include a significant increase in the operational capacity of ARPOV together with a widespread intellectual property campaign carried out by the Argentine Seed-men Association (ASA).

The success of the ERS would increase significantly if Argentina were to include a limitation of FSS use in its Seed Act. Without this improvement, success depends on the actions of ARPOV and the education for all stakeholders on the issue of intellectual property rights. ASA is working hard on educational campaigns to change cultural perceptions so as to promote the acceptance of intellectual property rights.

4.1.4 Efficiency of Collection

Argentina has an efficient royalty collection system for sales of certified seed, but overall, this efficiency is eroded by a high level of FSS, non-compliance with the Extended Royalty System and a significant level of illegal 'brown bag' seed sales. In addition, 15 per cent of FSS royalties collected is retained by ARPOV as compensation for the service of collecting FSS fees. The proportion of total available royalty income that is collected by breeders is estimated at approximately 50 per cent.



4.2 Australia

Denis McGrath, Director, Seedvise Pty Ltd; Executive Officer, Australia Exporter Company; Executive Officer, Feed Grain Partnership, Australia

4.2.1 General Introduction

Use of certified seed in the Australian small grains market is estimated at approximately 5 per cent with the balance of 95 per cent being FSS. The prevailing agricultural practice in Australia is that farmers only buy certified seed when they want to change variety; producing one's own seed on the farm is routine, as is 'variety sharing' - the practice of selling seed to other growers locally. This enables breeders to increase their market share even after a variety is no longer available as certified seed.

Australia differs markedly from the other countries in the present survey as the breeders' right to collect royalty is exercised on the commodity grain crop rather than on the initial seed purchase – an 'End Point' royalty system (EPR).

Over the past century, variety improvement has played a pivotal role in the success of the Australian grains industry. Until the early 1990s, new crop varieties were provided to growers via public breeding programs at virtually no cost to the industry or to the grower. Since the onset of the 21st century, as has happened throughout most of the developed world, governments have progressively divested their breeding and crop improvement responsibilities and transferred the task of cultivar development to the private sector.

4.2.2 The Australian EPR System

Due mainly to divestments of State Governments, and the response by GRDC (Grains Research and Development Corporation), grower groups and the global seed businesses, state-based and university breeding programmes have now largely been replaced by fewer and larger privately owned, or public / private partnership breeding companies. These new companies rely on royalty revenues as their principal source of income to grow and develop their proprietary breeding businesses. As innovative plant genetics and technologies are vital to success of Australian grain production, an effective, efficient and equitable royalty revenue collection system is essential to support crop improvement.

Legislative changes to the Plant Breeders Rights (PBR) Act in 1994 allowed variety owners to apply an end point royalty to the grain produced from nominated PBR-protected varieties as a means of collecting revenue to be reinvested in their plant breeding programmes. The introduction of an End Point Royalty collection system was supported by Australian grower organizations and by the GRDC. The EPR collection model was preferred in Australia over the seed based royalty collection model used in other developed grain producing countries for several reasons. Principally, as grain growers in Australia use retained seed to plant in excess of 90 per cent of the crop each year, a seed-based royalty scheme is unviable for major self pollinating crops.

In addition, Australian grain growers have had a strong culture of variety declaration at delivery; and the existence of monopoly grain marketing arrangements for wheat and barley (AWB, ABB) at the time supported the efficient collection of end point royalties (EPR's) at the first point of grain sale. Through this model, breeders and growers share the risks as breeders' income is directly linked to the level of variety performance and grower satisfaction, overlaid of course by seasonal conditions.



The EPR model has introduced a highly competitive business culture to plant breeding where breeding organizations compete with each other for market share by developing and commercialising attractive varieties that improve grower returns. In 1996 the first EPR wheat variety, Goldmark, was released. Over the next 14 years, more than 200 wheat, barley, oats, triticale, pulse and canola varieties bearing an EPR have been released onto the Australian market. Approximately 70 per cent of the Australian wheat harvest in 2009/10 was made up of EPR bearing varieties, which is an indication of the success of proprietary or 'EPR' varieties since 1996.

Deregulation of wheat export marketing in 2007, and the subsequent increase in the number of individual grain buyers had the potential to affect severely the efficiency and effectiveness of EPR collection system and ultimately the future of variety improvement in Australia. In response to this elevated risk, Australia's leading major plant breeding companies, licensed seed companies and other grain industry representatives including GRDC and GTA (Grain Trade Australia) formed an EPR industry group to address the threat. This industry group has engaged the support of Australian grain traders across the country and has been able to standardize a number of the licenses and agreements that support the EPR collection system in Australia. Most of Australia's major grain traders (approximately 50) have recognized the importance of EPRs to the future of the grains industry and have agreed to support the EPR Collection system. This has led to significant improvements in the effectiveness and efficiency of the EPR collection system in Australia. The success of Australia's EPR collection system is attracting investment in crop improvement to deliver Australia a competitive edge. This is demonstrated by the recent investments made by three leading global seed companies, and owners of key patents in the new molecular technologies, in Australia's three major wheat breeding companies¹⁴.

All participants in the Australian grain industry are now beginning to understand the importance of new technology in maintaining and improving their terms of trade against other grain-producing countries in a highly competitive international market. The EPR collection system is recognised as essential in achieving and sustaining this competitive position.

4.3 Canada

Patty Townsend, Chief Executive Officer, Canadian Seed Trade Association (CSTA), Ottawa, Ontario, Canada

In 2011, 33 per cent of the total crop area planted in Canada was wheat, making it the largest crop grown in the country. The level of certified seed usage in recent years has typically been around 12-20 per cent in the vast spring wheat areas of the prairies in Western Canada and higher – around 40 per cent – in the principally Soft Red wheat area of Ontario. In 2011, national certified seed use was estimated at 20 per cent by CSTA (Canadian Seed Trade Association).

4.3.1 General Introduction

Canada is a world leader in the development, production and marketing of crops like canola, lentils, beans and other pulses, but is falling behind in wheat. Canada once held the position as third largest ex-

¹⁴Syngenta (initially with AWB Ltd and now with Pacific Seeds) in LongReach Plant Breeders; Limagrain in Australian Grain Technologies and Monsanto in Intergrain.



porter of wheat in the world - but was recently surpassed by Russia – and Canada's share of the world market has shrunk to just 15 per cent from 23 per cent over the last 15 years.

Since 1970, the variety trial yield index for peas has increased by 40 per cent. The canola yield index has increased by almost 80 per cent, but the wheat index has increased by only 10 per cent.

Most of the new wheat varieties developed up to present have come from the public sector. However federal and provincial government funding for plant breeding and research has been declining in recent years. Private sector investment in cereals in 2012 is expected to be only 2 per cent of total private sector expenditure in plant breeding and associated research.

4.3.2 Factors Affecting the Current Situation

Farm-saved Seed

Most of Canada's wheat is produced in the western part of the country in Alberta, Saskatchewan and Manitoba. In that region, consistently more than 80 per cent of the seed used is saved from the previous year's grain crop, making it difficult if not impossible for the plant breeding industry to generate funds for investment through the sale of seed.

Poor intellectual property protection tools

Despite the fact that Canada signed the 1991 UPOV Convention in 1992, PBR legislation has yet to be amended to conform to UPOV 1991. Efforts to bring new internationally developed wheat varieties to Canada are thwarted by the inability to properly protect intellectual property.

Regulation

In Western Canada, for the last 75 years, the Canadian Wheat Board (CWB) held a monopoly on the marketing of wheat in export markets and for domestic human consumption. It also played a central role in the selection of new varieties for registration, holding a de-facto veto in the quality committee of the wheat variety recommending system. Until 2008 new wheat variety kernels were required to be 'visually distinguishable' (Kernel Visual Distinguishability = KVD) from each other in order to be eligible for variety registration as part of a system wide approach to create grain shipments of consistent quality. It is important to note that in Ontario, the requirement for KVD was removed in 1989 and the monopoly held by the Ontario Wheat Board was ended in 2000. Ontario wheat productivity gains have since been more significant than in the west. Farm-saved Seed use is still relatively high, but its use is much lower than in Western Canada.

4.3.3 Deregulation of the CWB

On August 1, 2012 the Canadian Wheat Board single-desk for wheat marketing ended, allowing producers to market their own wheat and barley for the first time since the 1943. The industry, from seed to further processing, while viewing the change as an opportunity, is still working to assess all of the potential impacts of the change.

However, already with the removal of KVD and the promise of more marketing freedom, interest is growing in the Canadian wheat industry.



4.3.4 Efficiency of Royalty Collection

94 per cent of the Canadian wheat crop is in the prairie provinces of Alberta, Saskatchewan and Manitoba where certified seed usage estimates range between 12 per cent and 20 per cent of total seed planted. Although certified seed use in Ontario and Quebec is higher (40 per cent), these provinces account for at most 6 per cent of the planted area. As there are no mechanisms in place for collection of breeders' fees from farmers who save their own seed, the efficiency of royalty collection on Canadian wheat seed is at best 20 per cent. This is the lowest level of breeders' remuneration recorded in the present study.

4.4 Czech Republic

Ladislav Rosenberg, Secretary General CMSSA (Českomoravská Slechtitelská a Semenárská Asociace), Praha, Czech Republic

4.4.1 Certified Seed Use

The usage of the certified seed in the Czech Republic has declined from 2008 to 2010. Data for spring crops in 2010 however show higher levels of certified seed use thanks to increased spring barley and spring wheat at the expense of winter cereals. In spring barley, certified seed use is positively influenced by processors of barley, whilst in spring wheat farmers usually do not have enough of their own seed. The sale of certified seed of spring cereals in 2011 (70 per cent usage) was as good as or slightly better than in 2010 according to a spring survey conducted by the Czech Seed Trade Association. For winter cereals, the situation is complicated by higher usage of FSS and illegal seed which together increased to

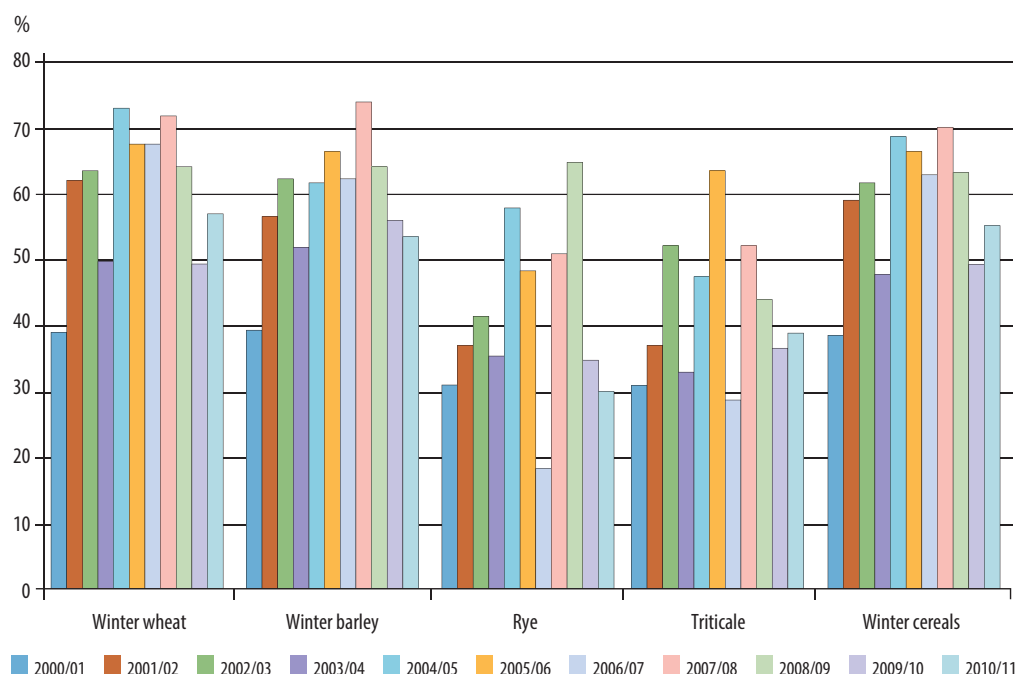


Fig. 2 - Czech Republic: development of the usage of certified seed (%).



more than 50 per cent in the autumn sowing season of 2009. The downward trend of certified seed in winter crops seed seems to have stopped in the 2010/2011 season and estimates provided by the Seed Association indicate a possible improvement of 6 to 7 per cent in 2011. Certified seed usage in winter wheat is now about 62 per cent.

4.4.2 Farm-saved Seed Use

Although European Union legislation exists to allow breeders to collect compensation for the use of FSS, problems arise due to the dual systems of protection, that is, national as opposed to EU PBR, as the implementing rules and legislation differ between the two, which in turn create difficulties in collection of information and compensation for the use of FSS. By strengthening the national legislation and introducing a uniform FSS regime covering both variety protection groups the situation would improve significantly. Mobile cleaners are increasingly active in the Czech seed market and their activity allows farmers the opportunity to conceal the true use of the seed processed. Whilst in some cases, farmers declare their FFS and pay the breeders' royalties, in others, the seed is sold illegally as 'brown bagged' seed.

4.4.3 Efficiency of Collection

It is estimated that 100 per cent of the royalty collected on certified seed is returned to the breeder of the protected variety, and certified seed accounts for 55 per cent of the seed market. Legally used FSS accounts for a further 25 per cent of the market and the payment of FSS remuneration is believed to be around 90 per cent. Illegally traded seed is currently believed to be 14 per cent of the market and the balance of 11 per cent is common varieties or small farmers who are exempt from paying FSS royalties. This leads to a relatively efficient recovery rate of 77.5 per cent of available royalty.

4.5 France

Antoine Alègre de la Soujeole, Managing Director, SICASOV, Paris, France

4.5.1 General Introduction

Total soft wheat cropping area:	5,000,000 ha (harvest 2011)
Number of wheat producers:	80,000 to 100,000 (not including small farmers)
Production of certified seed (2010/11):	360,000 t
Use of Farm-saved Seed (2010/11):	45%

Production of certified wheat seed in France is carried out by approximately 100 private companies or agricultural cooperatives. About 98 per cent of the wheat seed produced in France is of varieties that are protected either by the EU system (the majority), or by national protection. Royalties due on certified and Farm-saved Seeds are collected by the SICASOV (Société coopérative d'Intérêt Collectif Agricole des Sélectionneurs Obtenteurs de Variétés végétales) belonging to breeders which are either private companies or research public institutes.



4.5.2 Certified Seed

SICASOV works on a 'declarative system' based on statement forms sent to seed producers. Each year seed producers request SICASOV for licensing agreements for the varieties, generations and areas of seed crops they wish to produce. The licensing agreements are granted after consulting with the breeders and, at the end of the sales campaign, seed producers report the quantities sold by variety, generation and volume. Based on these reports SICASOV sends invoices to seed producers, collects royalties and distributes the royalties collected to the breeders in a very short time. This declarative system is monitored by consistency of statistics, by comparison with the certification data, by inspecting seed producers and by taking action against false declarations. This system of management and enforcement enables SICASOV to collect almost 100 per cent of the royalties due on certified seeds.

4.5.3 Farm-saved Seed

FSS royalties are collected in France through a system based on a levy payable on the grain crop. This system is made possible through an agreement between breeders and farmers which has been ratified by the Ministry of Agriculture.

Wheat grain is delivered by farmers to about 1,200 delivery points such as agricultural cooperatives, mills, port facilities, other industries etc. Each receiving point deducts a levy (check off) from the payment to each farmer and this levy is paid to SICASOV. SICASOV refunds the levy to farmers who can prove that they have bought certified seed from licensed producers. Of the levy collected, 85 per cent is allocated by SICASOV to the breeders of each wheat variety according to its market share. The remaining 15 per cent is allocated to a fund to support collective research programs relevant to wheat.

This system enables wheat breeders to earn an additional income of 25 per cent of the value of their income from certified seed sales. This system includes 90 per cent of the FSS used in France except for approximately 10 per cent that falls under the small farmers' exemption or is consumed on the farm where it was produced. The administration cost of the system is low (about 2 per cent)

The French system of collection of FSS royalties is efficient and relatively inexpensive but the system currently extends only to soft wheat and not to durum wheat, barley or other grain crops. In France, infringements are few and amounts of money involved are not significant.

4.5.4 Efficiency of Collection.

The system for certified seed royalty collection in France is highly efficient. All of the royalty on certified seed (with the exception of SICASOV administration costs) is returned to the breeders. FSS royalty collection in France is similarly efficient, but the agreed rate of payment at the levy / check off point is relatively low, so FSS royalty rate is only about 25 per cent of the certified rate. Nevertheless, the overall efficiency of the FSS collection system is very high – only a small amount of home-consumed grain and small farm exemptions lies outside the system. The study shows that overall, 92 per cent of available royalty is returned to the breeders of protected varieties – the third highest in the survey.



4.6 Germany

Christoph Herrlinger, Vice-Secretary General, German Plant Breeders' Association (BDP), Bonn, Germany

4.6.1 General Introduction

Approximately 130 plant breeding and seed trading companies currently operate in Germany. Around 60 breeding companies own breeding programs and a further 30 companies specialize in cereals. Cereals are planted on approx. 6.5 million ha (15 million acres). German cereal production in the last ten years averaged between 40 and 50 million tonnes. Wheat is grown on approx. 3.3 million ha (7.7 million acres) and the annual wheat production reaches between 20 and 25 million tonnes. The German agricultural business includes 120,000 farmers, 40,000 of these being 'small farmers'.

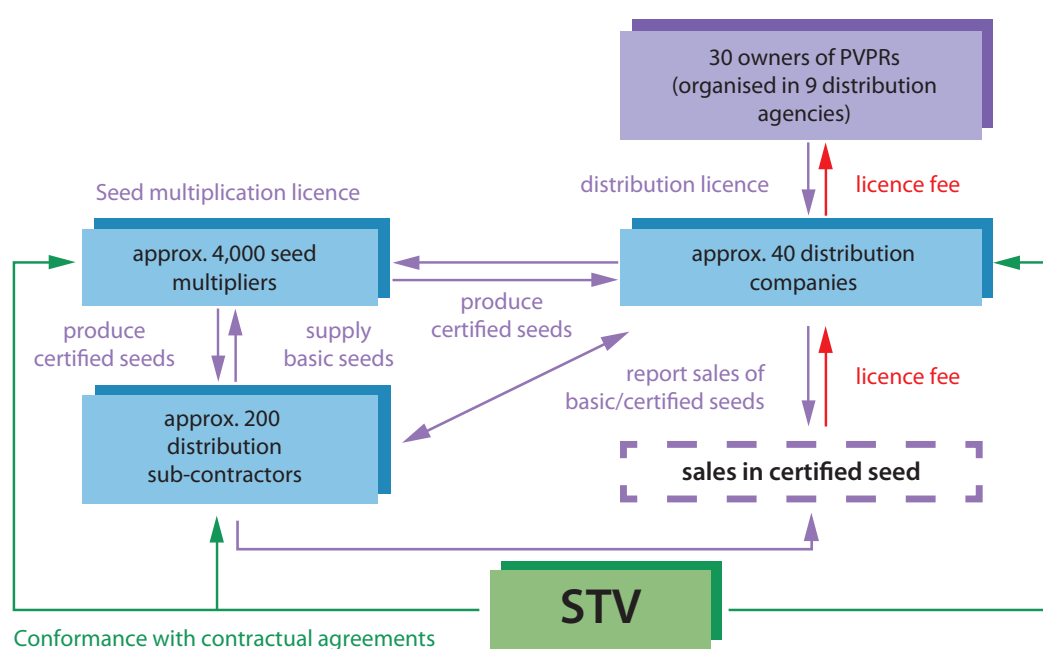


Fig. 3 - The licensing system for cereals in Germany.

4.6.2 Certified Seed

The Saatgut-Treuhandverwaltungs GmbH (STV) acts as a service company for 51 plant breeders (cereal, potato, oil and protein crops) and enforces the compliance with contractual agreements through a system of audits. Around 1,000 audits are carried out each year in distribution companies, distributors' sub-contractors and seed multipliers to look for license underpayments.

4.6.3 FSS Royalties

The regulation of FSS in Germany is covered by EU [PVP] Regulation No 2100/94 Articles 13 and 94; the German Plant Variety Protection Act §§ 10, 37; Private-law agreements; distribution licensing agreements

and production licensing agreements; and German Fair Trade Law §§ 3, 4 No 11 in connection with German Seed Marketing Act.

The collection of Farm-saved Seed royalty is also organized by the STV. In April each year around 85,000 farmers are addressed by STV through a declaration form, a list verifying the varieties the farmer has planted during the latest sowing season. For legal reasons, the plant breeder (through STV) has to present evidence that the farmer has had an opportunity to use of FSS of a given protected variety in order to obtain the requested information from the farmer for that given variety. Without such evidence, there is no general and comprehensive obligation to give information to the breeder.

The collected FSS royalties are distributed to the breeders by STV. The FSS royalty collected for cereals amounted to approx. 8.0 million Euros in 2010. Approximately 30 to 40 per cent of the FSS royalties cannot be collected due to the obligation of the breeder to provide evidence that the farmer had the opportunity to save seed of a given variety. Information about the extent to which FSS is used by individual farmers can also be obtained through requests to the processors. Also in this case evidence on the opportunity to use or process FSS of a given protected variety has to be presented in order to be able to collect the information. The Farm-saved Seed royalty collection system in Germany in principle works on a reasonable concept. But there is room for improvement, for example abolition of exemption for small farmers and the obligation to present evidence of use of given varieties.

4.6.4 Efficiency of Collection

An estimated 45 per cent of wheat seed and 49 per cent of cereal seed used in Germany is certified seed on which royalty is collected with 100 per cent efficiency. The other part is either FSS and/or illegally traded seed. However no data exist on the current levels of 'brown bagging'. Remuneration on the 55 per cent of seed that is FSS regarding wheat is collected with an estimated efficiency level of 30 per cent, resulting in an overall return to the breeder of 56.7 per cent of total royalties available.

4.7 Italy

Marco Nardi, Secretary General, Assosementi, Bologna, Italy

4.7.1 General Introduction

The total utilized agricultural area in Italy was recorded as 12.9 million ha in 2010. This area was cultivated by approximately 1.63 million farmers with an average farm size of 7.9 ha. The national average yield of soft and durum wheat in Italy is between 2.5 and 3.0 t/ha, therefore a 'small farmer' (producing less than 92 t of grain) would be classified as one cultivating less than 30 ha. Only 4 per cent of Italian cereal farmers (around 630,000) are today cultivating more than 50 ha of cereal agricultural land, 23 per cent between 10 and 50 ha and the remaining 73 per cent farm less than 10 ha.

In the last decade of the past century, when crop subsidies were coupled to production, the use of certified seed was compulsory in order to claim subsidies under the Common Agricultural Policy (CAP) in force at the time within the European Union. Following the decoupling of subsidies from grain production during the CAP reform of 2005, the Italian area of durum wheat production fell from 1.77 million ha (2004) to 1.15 million ha (2011) whilst the soft wheat area fell from 580,000 ha to 500,000 ha over the



same period. The loss of 700,000 hectares of wheat production (all from certified seed) combined with the removal of the requirement to use certified seed in order to claim subsidies, brought the Italian wheat seed market into crisis.

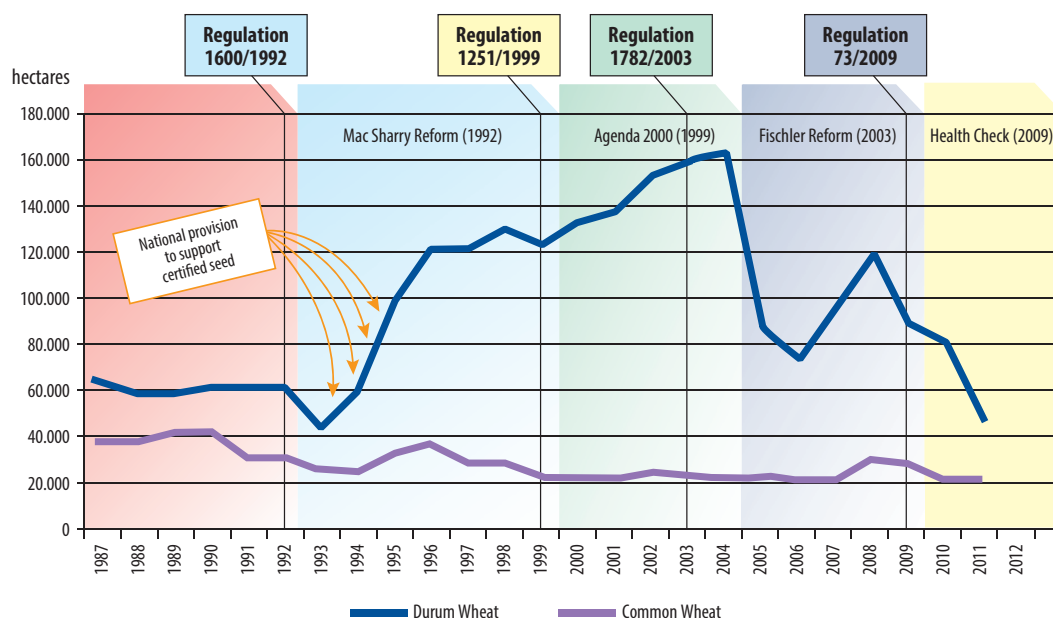


Fig. 4 - Impact of EU CAP reforms on wheat seed production in Italy.

4.7.2 Certified Seed

In the early 2000s, use of certified seed of durum and soft wheat varieties by Italian farmers was estimated at more than 90 per cent of the total seed requirement. The level of certified seed use has now fallen to approximately 55 per cent with the balance of 45 per cent being made up of approximately 15 per cent legitimately saved by farmers and an estimated 30 per cent illegally traded (brown bag) seed. Royalties payable on the 55 per cent of seed that is certified are collected directly by the breeder, so no royalties are spent in external administration.

4.7.3 Farm-saved Seed

Many obstacles exist to prevent the collection of FSS royalties in Italy. At present, Italy has no legislation or system in place to require farmers to pay a royalty in return for their use of FSS. Whilst EC regulation 2100/94 on Plant Variety Protection identifies and regulates the use of FSS, Italian PVP law does not acknowledge FSS. Hence, collection of FSS royalties currently requires EU Plant Breeder's Rights rather than National PBR and at present only around half of the major durum and soft wheat varieties are protected by EU PBR. A further problem is that almost 85 per cent of cereal farms in Italy qualify for the small farm exemption and would not be required to pay FSS royalty.

4.7.4 Efficiency of Collection

For the Italian seed market, the calculation is a simple one. Certified seed accounts now for 55 per cent of the total seed requirement and royalties are collected on 100 per cent of certified seed sales. Obviously no royalties are collected on illegally traded seed or on legitimate FSS. The overall efficiency of return to the breeder is therefore 55 per cent of the total available market.

4.8 Mexico

Frank Curtis, Executive Vice-President and Chief Operating Officer, Limagrain Cereal Seeds, Fort Collins, Colorado, USA

4.8.1 General Introduction

Mexico's agricultural sector accounts for 5 per cent of the country's GDP and employs 13.7 per cent of the work force. Crop production is the most important agricultural activity in Mexico, accounting for at least 50 per cent of agricultural output. Livestock production accounts for a further 30 per cent. Domestically, the most important crops for consumption purposes are wheat, soybeans, corn, and sorghum. Although nearly half of Mexico's total land area is officially classified as agricultural, only 12 per cent of the total area is cultivated, owing to the arid conditions. More than 80 per cent of the cultivated land in Mexico requires regular irrigation if it is to remain in cultivation. Mexico was able to increase the area of irrigated land used for crop production from just 1.5 million ha in 1950 to more than 3.5 million ha by 1965 and over 6 million ha by 1990. It is estimated that half of Mexico's producers are subsistence farmers and over 60 per cent produce corn or beans, with the majority of these farmers cultivating five hectares or less, although the number of Mexican farmers is steadily decreasing as they seek greater economic opportunities from off-farm employment. Wheat production in Mexico rose from around 1.2 million tonnes in 1960 to almost 4 million tonnes in 2010, although during that period, the area harvested has remained remarkably constant at around 850,000 ha. Whilst the Mexican wheat market enjoys a high level of certified seed usage, most of the varieties grown by farmers originated from public funded breeding programs and do not carry a royalty.

4.8.2 Certified Seed

The use of certified seed in Mexico is very high – currently estimated at almost 90 per cent. However, owing to the public nature of variety releases, much of this seed does not attract a royalty payment to the breeder of the variety. Approximately half of the seed used in Mexico is of proprietary, royalty bearing varieties. PVP laws are enforced and royalties are collected by the Servicio Nacional de Inspección y Certificación de Semillas (SNICS), but resources are limited within SNICS and up to 10 per cent of potential royalty income is expended on enforcement activities.

4.8.3 Farm-saved Seed

FSS is not widely used in Mexico – currently around the 10 to 11 per cent level - and does not therefore play a significant part in the calculation of efficiency of royalty collection in the state.



4.8.4 Efficiency of Collection

Certified seed use is estimated at 89 per cent and the legal use of FSS at 11 per cent. Taking into account the royalties expended on the operations of SNICS, and the presence of around 50 per cent of free, public varieties in the market, it is possible to calculate that 40 per cent of the total potential royalty income in Mexico is collected and returned to the breeders of proprietary varieties.

4.9 Poland

Paweł Kocharński, Chairman of the Board and CEO, Agencja Nasienna Sp. z o.o., Leszno, Poland

Malin Nilsson, Lantmännen SW Seed AB, Svalöv, Sweden

4.9.1 General Introduction

Poland has a total wheat area of approximately 2.2 million hectares (5.4 million acres) and is the fourth largest wheat producer in the European Union. Average wheat yields are relatively low - about four tonnes per hectare - and the share of certified seed is only approximately 15 per cent; 55 per cent of the wheat area is sown with Farm-saved Seed; and the balance of 30 per cent is so called brown bagging. In 2003 a company, Seed Agency Ltd (AGNAS) – a breeder's organization for safeguarding of the rights of its members with regard to PBR - was founded by the largest cereal breeding companies in Poland. In 2006 a number of foreign breeding companies joined AGNAS and today there is a total of 19 members. AGNAS started to establish a system for collection of remuneration from farmers for their use of Farm-saved Seed of protected varieties in 2006 and the system is still under development.

4.9.2 Certified Seed Market

Given the low level of certified seed used in Poland, AGNAS has initiated information campaigns with the purpose of informing farmers of their rights and obligations when using certified seed of protected varieties. In 2008 AGNAS introduced a label to be used on all bags containing certified seed of protected varieties from their member companies and initially the seed multipliers and processors' society showed great resistance to this regime. In 2008, 40,000 labels were distributed for free to be pasted onto seed bags. In 2009 the number was 350,000 and in 2010 the label was introduced as an obligation into the member breeders' license agreements in Poland resulting in distribution of more than 400,000 labels and also labels printed directly onto bags.

4.9.3 Farm-saved Seed

Currently the agency has 19 shareholders representing cereal and potato breeders. The tasks of AGNAS are to inspect license agreements between its membership and national seed companies; to fight against infringement of PBR; and to collect remuneration on Farm-saved Seed and to carry out inspection in relation to the same.

Farmers are obliged by law to pay FSS fees within 30 days after sowing, and seed processors are obliged to provide information on their services rendered. In practice however, AGNAS sends a request for infor-



mation to farmers and the information submitted is used by the breeders to issue invoices directly to the farmers. AGNAS may visit the farmers on behalf of its members in order to check the accuracy of the information provided. As part of the work to continuously improve the collection system, farmers will from 2012 onwards be invoiced by AGNAS, instead of by each breeder, and will distribute the collected FSS royalties among the breeders of the varieties in question.

4.9.4 Efficiency of Collection

Polish agriculture has a significant share of small farmers who are exempted from the obligation to pay remuneration to the breeder for use of FSS of protected varieties, contributing negatively to the available royalties. Eighty-five per cent of potato farmers (less than 10 ha) and 96 per cent for other species covered by the FSS exception (less than 25 ha) of the total number of farmers are defined as 'small farmers' by law. Another impediment in the collection work carried out by AGNAS is difficulties in obtaining farmer addresses for requesting information on the use of FSS. AGNAS currently only has access to 60,000 farmer addresses out of a total of 340,000 farmers (above 10 ha) obliged under current legislation to report and pay.

In spite of an efficient system for collection of royalties on certified seed, the small area planted with certified seed in Poland and the relatively expensive system for collection of FSS fees (30 per cent) results in an overall efficiency of the Polish royalty collection system of only 21.6 per cent, which is among the lowest in the current study.



4.10 Spain

Antonio Villaroel, Secretary General, Asociacion Nacional de Obtentores Vegetales (Anove), Madrid, Spain

4.10.1 Certified seed

The rate of cereal certified seed use in Spain has been traditionally low for several reasons: the modest yields in many areas, the lack of agricultural development and the scarcity of competitive local breeding programs. Use of certified seed increased from the mid-1990s and onwards for a number of reasons, for example through EU agriculture subsidies requiring use of certified seed of certain listed varieties in durum wheat. In addition, the incorporation of GESLIVE (plant breeders' association), which developed centralized license management, introduced systematic inspection policies and reached agreements with farmers' cooperatives to promote certified seed and enforce PBR.

The trend towards certified seed use was reversed in subsequent years by low commodity values and rising fuel and fertilizer prices which caused farmers to cut costs and spend less money on quality seed. The discontinuation of the above mentioned quality premium for durum wheat also had a collateral effect in other species such as barley or soft wheat.

Currently, the proportion of certified seed in cereals used is slightly above 20 per cent, but in durum wheat, this figure is 72 per cent, followed by triticale at 45 per cent, soft wheat 18 per cent, barley 16 per cent and oats 9 per cent. The market is principally for R2 seed (second generation certified). The balance of almost 80 per cent of seed used by farmers is divided between FSS and several forms of illegal seed such as block farming and brown bagging.

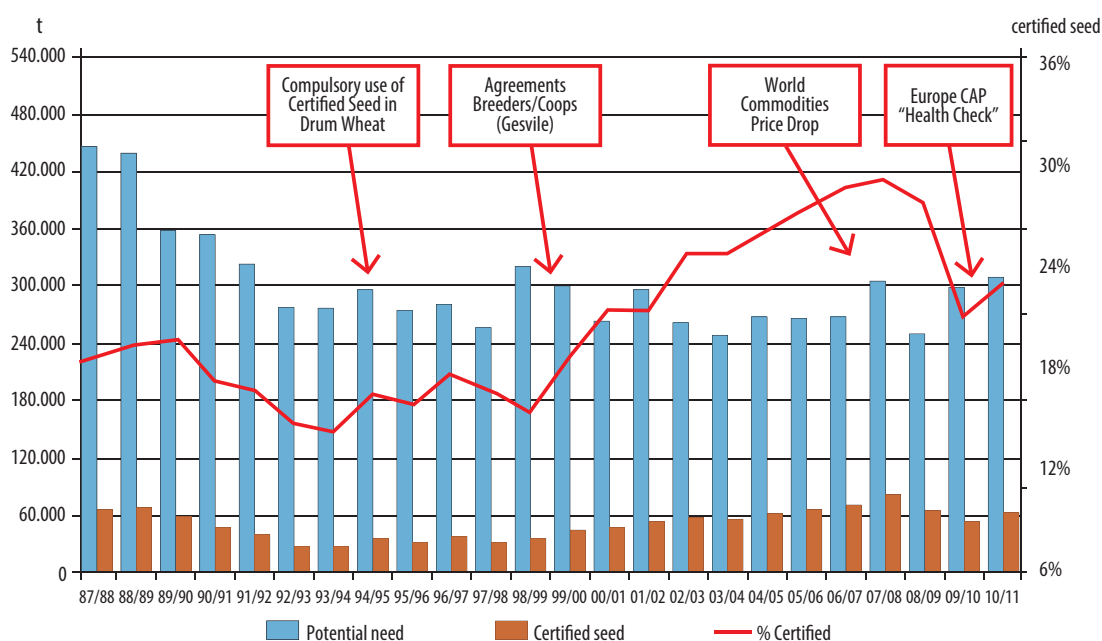


Fig. 5 - Spain: Influence of external factors on the use of certified seed.

4.10.2 Marketing of Certified Seed in Bulk

In December 2011, a new Regulation on Marketing of Seed in Bulk was introduced to modify Directive 64/2001, providing simplification and cost reduction of the certification system. From 2001 until the introduction of this new Regulation, the marketing of seed in bulk was carried out only between licensed seed producers, but the new system introduces the opportunity to market R2 seed in bulk directly to farmers. Any suppliers' facility that can achieve separate identification of seed lots and statutory certification requirements can now offer seed in bulk to farmers. This new Regulation will allow substantial savings in costs and time compared to packaged seed, narrowing the gap between certified and 'uncertified' seed costs in Spain.

4.10.3 The Farm-saved Seed Scheme

The new Spanish scheme for the collection of remuneration on FSS use of protected varieties is based on two agreements at the national level between organizations representing plant breeders (ANOVE-GESLIVE) and agro-cooperatives (AGRI-FOOD COOPERATIVES); seed producers and processors (ACCOE, APROSE, SEMICAN, ACMLL).

The agreement was signed in July 2011 and applies to cooperatives and breeders that joined it voluntarily. The collection scheme applies to all varieties protected by either Spanish or Community (European Union) PBR. The aim of the agreement is to establish terms and conditions under which the cooperatives and processors will provide GESLIVE (representing the breeders) with relevant information regarding the processing of FSS under the Farmers' Exception and the terms for collection of FSS fees from farmers.

GESLIVE administers the scheme and collects the FSS fees on behalf of the breeders. As established in the EC Regulation (2100/94) on PVP, the FSS compensation is 50 per cent of the lower royalty used for certified seed production license (R2/C2) for EU protected varieties; and 40 per cent for varieties protected by Spanish PBR.

The collected funds are used as follows:

- Remuneration of breeders represented by GESLIVE: 50 per cent.
- Collection management costs, to the cooperative or processor: 20 per cent.
- Local breeding research fund: 15 per cent.
- Campaign to support certified seed: 15 per cent.

A need for additional funds is foreseen during a transitional period of three years, aiming at education, promotion and consolidation of the new scheme.

4.10.4 Enforcement of Plant Breeder's Rights

In Spain, infringement of the breeder's exclusive rights can be prosecuted by the holder and, under certain conditions, even be considered as a crime, punished under the Spanish Criminal Code (article 274, ap.3 and 4) with up to two years imprisonment.

GESLIVE manages licences to produce and market material of protected plant varieties (about 750 varieties and 3,000 licences during 2011). Enforcement of PBR is carried out through administrative reporting;



civil actions directed to penalise unauthorized production and marketing of protected plant material; criminal prosecutions in accordance with Article 274 of the Spanish Criminal Code; and customs interventions to prevent the entrance of EU protected varieties produced in third countries without authorization.

From the date of its incorporation, GESLIVE has started some 200 legal proceedings, 16 of which are still open, concerning infringement of PBR (propagation and sale; illegal use of FSS) in cereal varieties. Thirty-three condemnatory sentences have been obtained in different jurisdictional areas, resulting in prison sentences for 32 infringers and imposing corresponding fines and compensation for damages. In many others cases, agreement has been reached between the parties, avoiding criminal proceedings.

4.10.5 Efficiency of Collection

In spite of the tremendous efforts made by GESLIVE to capture royalties for the use of breeders' intellectual property, the efficiency of the Spanish royalty collection system remains one of the lowest in the present study.

Although collection of certified seed royalties is highly efficient and FSS is becoming increasingly regulated, the very high proportion of 'brown bagging' in the territory leads to a very low overall efficiency - approximately 22 per cent.



4.11 Sweden

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4.11.1 General introduction

Sweden is a relatively small agricultural market with a total area of arable land of about 2.6 million hectares (6.5 million acres). The major field crops are winter wheat, spring barley and spring oats. The predominant system for the protection of plant varieties in Sweden is through plant breeder's rights as in UPOV 1991. Very few varieties contain technology or traits which are patented or protected as trade secrets.

4.11.2 Certified Seed Market

The seed market consists of a moderate number of companies (<50) active in seed multiplication and sales both through distributors and directly to farmers. The level of certified seed use is generally high across the field crops and certified seed use ranges from 65 to 85 per cent. Differences in the rate of certified seed use between years are due mainly to weather conditions at harvest: farmers save their own seed to a greater extent in years with favourable conditions. The royalty on certified seed is included in the seed price, and thanks to the limited number of seed companies in the market the variety owners and/or representatives have a fairly easy task to collect these royalties themselves and there is no evidence of evasion by licensees. The efficiency of royalty collection has therefore been recorded as 100 per cent for the purpose of this report.

4.11.3 Farm-saved Seed

Under the Swedish system for collection of royalties for the use of FSS, both farmers and seed processors are obliged by law to submit information about their processing and use of FSS. The task and responsibility for collecting information and royalties on the use of FSS has been delegated to the Swedish Seed Trade Association (SSTA) by its members. The members supply SSTA annually with a list of protected varieties for which they wish SSTA to collect FSS fees. In agreement with the farmers' union, the level is set as a percentage of the royalty on certified seed. Information about the agreement and the list of varieties is subsequently published in the Official Journal of the European Union.

The Swedish Board of Agriculture supplies the SSTA with addresses of all farmers obliged to pay royalties on FSS and the SSTA uses these addresses to distribute a questionnaire twice annually, following spring and autumn sowing respectively. The farmers are obliged to declare their use, or non-use, of FSS and return the questionnaire to SSTA either by regular mail or using a web-based form. Seed processors are obliged to report on whose behalf seed has been processed, as well as quantity and name of each variety. Owing to the highly organised system of collection for FSS remuneration, the efficiency of collection is very high – estimated at 90 per cent - and among the highest levels recorded in the present study.

The highly organised structure of Swedish agriculture is one of the key factors for the success of the system for collection of FSS royalties:

- The support for plant variety protection among individual farmers is high; the sole plant breeding company in the country is owned by the majority of Swedish farmers through their membership of an agricultural coop, Lantmännen. Farmers are proud of their plant breeding company and there is



a high level of understanding of the connection between certified seed, FSS and investment in plant variety development.

- The system for compensation to the breeders for the use of FSS has strong support from the farmers' union, allowing for a constructive discussion during the annual negotiations on the remuneration levels.
- Sweden has a relatively small number of farmers which facilitates administration of the FSS royalty collection system.
- The vast majority of the varieties grown are protected under Swedish national or European Community plant variety rights law.
- Willingness of the Board of Agriculture to supply SSTA with addresses combined with the legal obligation of farmers and processors to complete and submit the questionnaire, whether or not they have used/cleaned FSS, is a considerable strength of the system.
- The lifetime of varieties is short: new, improved varieties are introduced frequently, thus reducing the possibilities for older varieties to be used as FSS on a large scale.

Despite the high ranking of the Swedish system in efficiency of collection as presented in the current study (Table 1) there are several weaknesses in it and with that, clear opportunities for improvement:

- The Board of Agriculture is responsible for supervision of compliance with the seed laws, but lacks experience and established routines for handling of infringement cases.
- Remuneration is set as a fixed percentage of the royalty on certified seed which is considered as a pragmatic and fair system. However, the royalties on certified seed are often established individually for each variety and there is a trend towards an increase of the varieties with lower fees in the reports on the use of FSS. This trend is assumed to be an effect of an increased dishonesty in reporting by the farmers.
- The vague definition of 'own holding' in the farmer's exemption is an increasing problem. Block farming is an increasing practice in Sweden and FSS is often shared among the farms in those farming units with an interpretation of the block as a 'holding'.

4.11.4 Efficiency of Collection

Sweden has an extremely efficient system of collection for both certified seed and FSS royalties. The estimated efficiency level of 100 per cent for certified seed and 90 per cent for FSS, combined with the very high level of certified seed use in the territory produces an overall efficiency of collection indicator of 94.4 per cent - the highest level encountered in the present study.

4.12. United Kingdom

Frank Curtis, Executive Vice-President and Chief Operating Officer, Limagrain Cereal Seeds, Fort Collins, Colorado, USA

4.12.1 General Introduction

The United Kingdom is the third largest wheat producer in Europe behind France and Germany, with a crop area of approximately 2 million ha (5 million acres) and an estimated seed usage of 330 to 350,000



tonnes annually. Winter wheat represents more than 96 per cent of the area sown and spring wheat is a relatively minor crop. In general, wheat production in the UK is extremely intensive, with high levels of fertilizer use and prophylactic disease control programs that can result in four or more applications of foliar fungicide each year. Yields in the United Kingdom are among the highest in the world, averaging between 7 and 8 tonnes per hectare, with many growers achieving 12 tonnes per ha (5 tonnes per acre). Both certified seed and FSS play an important role in the establishment of the UK wheat crop and breeders are able to collect royalties / remuneration efficiently in both cases.

4.12.2 Certified Seed Market

Approximately 58 per cent of the current UK wheat area is sown with certified seed, the balance of 42 per cent being sown with Farm-saved Seed. In the 2011/12 season, over 190,000 tonnes of certified winter wheat seed and approximately 8,000 tonnes of spring wheat seed was purchased and used by UK farmers. Royalty is paid on this certified seed by the first processor and seller of the seed and any wholesale or retail sales made from the point of processing onwards are made on a 'royalty paid' basis.

Royalties are not collected directly by the breeders, but by the British Society of Plant Breeders (BSPB), an organization constituted and directed by the individual members of the UK plant breeding industry. The BSPB is empowered by the breeding companies to issue licenses to processors on their behalf. Each licensed processor is then obligated by the terms of their license to remit royalties due on the seed they have processed and sold.

The BSPB collects the gross royalty payable by licensees at the end of each sales season and disburses these funds to the breeders of licensed varieties according to the volume and grade of each variety sold. The royalty collection and disbursement activity of the BSPB has been calculated to cost between 1 and 2 per cent of the total certified seed royalty; therefore at least 98 per cent is paid to the breeders.

4.12.3 Farm-saved Seed

Under legislation enacted in compliance with the principles of UPOV 1991, UK farmers making use of FSS are required by law to compensate the breeders of protected varieties for using their intellectual property in this manner. A number of methods for calculating and paying the sums of money due exist and these are all administered by the BSPB. Only farmers with farms producing less than 92 tonnes of grains (16 ha or 40 acres) are excused from paying FSS royalties under the 'Small Farms Exemption' scheme.

The estimated volume of FSS of wheat in the United Kingdom is approximately 150,000 tonnes. Although instances of large-scale illegal trade in FSS occur from time to time, this is in a relative small number of cases, as the BSPB is extremely vigilant in tracking the use of farmers' own seed and is rigorous in enforcement of Plant Breeders' Rights, cooperating with the official authorities in their prosecution of suspected offenders.

The most common form of FSS in the United Kingdom is farmers' own crops processed for seed use by operators of mobile seed cleaning equipment. Under an agreement with the National Association of Agricultural Contractors (NACC) each mobile seed processing contractor who agrees to take a royalty collection agreement is audited by the BSPB and is required to submit a report of their seed cleaning



activities each season. Processors who do not have an agreement with BSPB to collect FSS royalties are obliged by law to provide BSPB with the details of all the farmers for whom they have cleaned seed. In addition, all farmers are required to submit a return to BSPB of all seed retained for sowing, whether or not they have used the services of a mobile seed cleaner. Whilst the information that is returned does not give a complete picture, BSPB can, and does, use the records on its database to identify discrepancies in farmers' returns and follow them up. Farmers using FSS in this manner have the choice of paying royalty to the operator of the mobile seed cleaner on a per tonne basis or paying directly to the BSPB on a per hectare basis.

In some cases, larger growers may have their own fixed seed cleaning facilities. Again, each farmer is required to complete an annual return detailing the volume of each crop species and variety retained for sowing. Breeders' remuneration is based on the number of hectares sown with the FSS for all direct payments to BSPB.

BSPB estimates the efficiency of FSS royalty collection at approximately 90 per cent of the total available. Evasion of FSS royalty accounts for the balance of 10 per cent. Collection of FSS royalty is however, not without cost. Covering the administration costs of the BSPB and allowing the NACC to make a small retention of royalties to compensate their members for their extra work, costs the breeders an estimated 6 to 7 per cent of the total fees available from FSS.

4.12.4 Efficiency of Collection

Collection of royalties on certified seed and FSS is accounted for with great accuracy by the BSPB and the efficiency of collection figure is therefore reliable. The figures demonstrate that with 100 per cent collection of certified royalty at 1.2 per cent cost; and 90 per cent collection of FSS remuneration at 6.2 per cent cost, the overall efficiency of royalty collection in the United Kingdom is 92.8 per cent, the second highest in the current study, slightly behind Sweden.

4.13. United States of America

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4.13.1 General Introduction

The United States is the fourth largest wheat producer in the world, with a crop area of 23 million ha (57 million acres) and an estimated seed market of over 2 million tonnes. Overall, approximately one-third (>700,000 tonnes) of the wheat seed used by farmers in the United States is bought seed, the other two-thirds being drawn from farmers' own production (FSS) but this ratio varies widely from region to region.

The predominant system for the protection of plant varieties in the United States is through the PVP Act, first introduced in 1970 and amended in 1994. Unusually, in the case of the United States, an alternative method of cereal variety protection exists – that of Utility Patents. Whilst elsewhere in the world few cereal varieties exist that contain patentable technology or traits, a number of private sector breed-



ers use Utility Patents to control the production and distribution of their varieties. At the time of writing, no Utility Patents exist for wheat varieties released by the public sector.

The bought seed market in the United States is not necessarily all certified seed, as (unlike Europe) sale of uncertified seed is legal in certain circumstances. Uncertified seed may be sold legally either as 'Quality Assured' (QA) seed, which is inspected and approved by State seed departments, or as 'bin run' seed, 'variety not stated'. Bin run seed of unprotected, public varieties may be traded legally by farmers; however the sale of privately owned and/or PVP protected varieties in this manner (brown bagging) is illegal. For the purpose of this report, QA seed is included within the definition of certified seed as it is officially regulated and is royalty bearing. Sales of bin run seed however, whether legal, (public varieties) or illegal (brown bagging) have been included within the definition of FSS as no statutory controls are in place and no royalty is paid. The volumes of legitimate FSS and illegally traded FSS are difficult, if not impossible, to assess as custom seed-cleaning plants are extremely protective of customer confidentiality.

4.13.2 Bought (Certified and QA) Seed Market

More than 1,000 registered producers and sellers of certified and QA seed currently do business in the United States. However the standard practices of the companies and the density of producers differ markedly between different regions. The most concentrated area of wheat production and the highest frequency of seed producers are seen in the plains states from North Dakota in the north, to Texas in the south. The Pacific Northwest states of Washington, Oregon and Idaho represent a second area of concentrated wheat production, whilst a third significant area lies along the eastern seaboard and in the Mississippi/Missouri river system; from Louisiana in the south, and northwards as far as the upper mid-west states of Wisconsin and Michigan.

For the purpose of this report, these three areas have been analysed separately, as cultural practices differ widely between the three regions. The area of most intensive certified seed use lies in the Pacific Northwest, where the farming environment is dominated by a very strong cooperative movement based on grain growing and marketing groups. Certified seed use in the region is typically around 85 per cent, leading to a very efficient capture of seed royalties. Many retailers in this region require farmers to sign a contract in which they agree not to save seed for future use before they will deliver seed of proprietary varieties, and this practice helps to maintain the very high level of certified seed use. The proportion of bought seed use in the eastern and Mississippi/Missouri mid western region is estimated at between 50 and 60 per cent - approximately half of which is certified and half Quality Assured. The lower of these two estimates (that is 50 per cent) has been used for the report.

The lowest levels of certified seed use are undoubtedly in the Great Plains region. This area is typified by a high density of relatively small seed producers, many of whom offer custom cleaning services for FSS as well as sales of certified seed. Within the plains area, certified seed use varies from around 35 per cent in Colorado (a state with a policy of strong branding of their research and enforcement of IP rights) to less than 15 per cent in Oklahoma and Texas, where wheat production is of secondary importance compared to cattle farming. The average rate of certified seed use throughout the Great Plains has been estimated at 25 per cent.



4.13.3 Farm-saved Seed

Under the US system of plant variety protection, the use of FSS of patented varieties is normally forbidden by the patent holder, but FSS of varieties either with PBR protection, or without any form of protection is commonplace. There is no formal system for tracking, regulating, or collecting royalties on FSS in the United States, as these activities are not supported by current seed laws or by the PVP Act. Some smaller breeders have in recent years operated a contractual system that allows farmers to save - and trade - uncertified seed in return for payment of a royalty to the owner of the variety, but this practice is now becoming scarce as breeders now rely on more robust and enforceable IP protection mechanisms.

4.13.4 Efficiency of Collection

The US system requires the owner of IP rights to make their own royalty collections from producers whom they licence to market their varieties. There is therefore no hidden cost of administration and all of the royalty on legally sold certified or QA seed is recovered by the breeder. Although the rate of bought seed used has been shown to vary widely from region to region, a reasonable approximation can be made at a national average. There are no significant collections of FSS royalty of any kind in the United States. Therefore the average value capture efficiency of wheat seed royalties in this market has been calculated at 33 per cent of the total wheat seed usage.

4.14. Uruguay

Diego Riso, Executive Director, Uruguayan Plant Breeder Association (URUPOV) Montevideo, Uruguay

4.14.1 General Introduction

Uruguay is a country in which GDP (Gross Domestic Product) and export markets depend highly upon agricultural products and the associated industry. The country lies entirely within the temperate zone and most regions have adequate supplies of water from the country's numerous rivers, lakes and lagoons. In the last decade, as more and more arable land has been brought into production, the total arable area has more than doubled, especially in wheat and soybeans that have had approximately a fourfold increase. Uruguay has a total area of 17 million hectares, of which 4 million are arable. In these areas, grassland farming rotation systems are used to prevent soil degradation and erosion. This practice limits the area cropped annually to 2 million ha (1.6 million annual crops and 0.4 million perennial crops).

Currently, 3,000 farmers grow the two major crops: soybean (1.1 million hectares, genetically modified) and wheat (650,000 hectares).¹⁵ Whilst almost half of the seed sown by Uruguayan farmers is of certified origin; Farm-saved Seed and 'brown bag' seed are both highly significant. Fortunately farmers using FSS pay royalties back to the breeders, bringing the level of brown bagging to 5 per cent.

In 1994, Uruguay was the first country in South America to ratify UPOV so currently its seed law is based

¹⁵Data for year 2011.



on the UPOV 1978 Act with important amendments ('improvements') taken from the UPOV 1991 Act. The Uruguayan Plant Breeders' Association (URUPOV) was founded in the same year and is a private association focused on royalty collection and enforcement of PBR. In 1997, the National Seed Institute (INASE) was created and is the official body in charge of PBR. Currently these two institutions work in a coordinated manner in order to effectively enforce the aforementioned activities.

4.14.2 Breeding and Germplasm

Wheat is a very important crop and probably one of the first species to be cultivated in Uruguay. In the early 1900s the government hired a German breeder in order to promote plant breeding and improve local varieties. Since then, the National Research Institute for Agriculture (INIA) has been an important player in plant breeding in Uruguay. Since the 1990s regional and international seed companies have been established by their own or through license agreements with local companies. Today, Uruguayan farmers have access to a wide range of novel varieties of national and international origin.

4.14.3 Royalty Collection

The graph in Fig. 6 illustrates the development of the total area planted with wheat and the royalties collected on certified seed and FSS.

Final figures for 2011 illustrate that 95 per cent of the total area planted was with seeds that bear royalties: either certified or FSS.

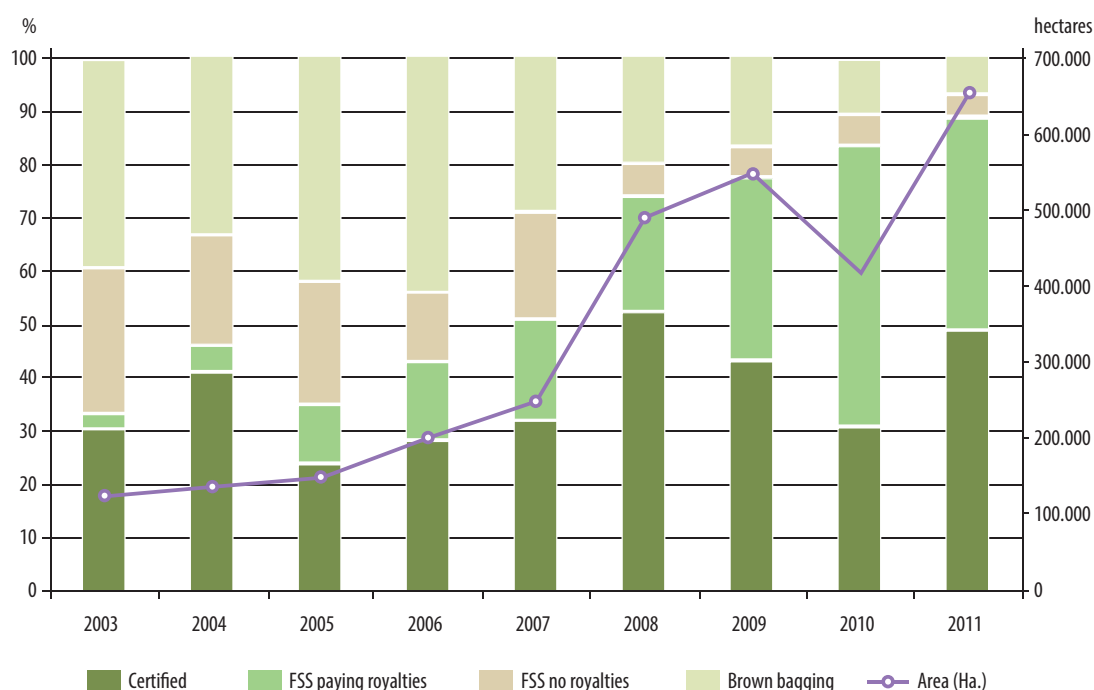


Fig. 6 -Development of the total area planted with wheat (ha) and royalties collected on certified seed and FSS (%).



4.14.4 The 'innovative' Royalty Collection System on FSS

The 'Technology Value System' or 'Extended Royalty System' (Rapela & Risso, 2006/2007) has been in force since 2003. Its main goal is to collect royalties from FSS. Currently this is being applied for soybean, wheat, barley and peas. When the seed is purchased, a contract is signed between the breeder and the grower, in which the conditions to produce and use FSS are established. The contract is renewed with every new multiplication or use of the protected varieties as FSS and payment is due only on seed sown.

URUPOV collects information from its members on name of farmer, contact details, variety and amount of seed purchased. On the basis of that information, auditors from URUPOV personally visit farmers in order to get a declaration form signed twice a year: after harvesting (to collect information on amount and location of saved seed) and again after sowing (to collect information on seed sown). Finally, URUPOV processes all the information collected 'in field' and a database is available online (www.urupov.org.uy) for breeders to make the invoices and to collect the royalties.

4.14.5 Tax Incentive

Since 2007, the government has applied a tax incentive program to encourage the development of the certified seed industry. Uruguay has a decree (Regulatory Decree 150/2007 Art. 57), that gives farmers the benefit of claiming a tax incentive of 1.5 times the amount of money they spend on certified seed when declaring their income tax. This measure has been very successful and has been a key factor in obtaining the high level of value capture.

4.14.6 Enforcement

Official control of enforcement of rights under the Seed Acts is carried out by INASE. Additionally, URUPOV has a 'task force' made up of specialized professionals. The purpose of the task force is field work, collecting information about illegal seed trade and detecting 'brown bagging' to complement and strengthen INASE's activities.

The objectives for collection of information by URUPOV are:

- to supply INASE in order to allow for supervision, confiscation and/or seizure of the products and the application of the corresponding penalties (warnings, monetary fines and even business closures);
- to support breeders with information to facilitate selection of business partners (seed multipliers, seed distributors) and customers (farmers); and
- to support breeders in enforcement of their rights in court cases made either through URUPOV, or directly by the breeders.

As an example, in 2007 a case considered a 'milestone' in Uruguay: a farmer who was unable to prove the origin of the seed used for cultivation of a new, protected variety had to pay a fine, URUPOV submitted the claim to INASE who acted effectively, requesting a search warrant in order to take viable samples of the allegedly illegal seed and to measure the farmland with GPS. For the first time, INASE simultaneously used molecular markers (micro-satellites) and field tests (post control) for variety identification. The conclusion of the case was in favor of the breeder, resulting in a monetary penalty for the farmer and validation of the molecular technique for enforcement.



URUPOV now has an agreement with a lab in order to regularly use the DNA fingerprinting techniques to be effective in its enforcement activities. Currently, URUPOV is developing specific software that will use satellite images and farm localizations to strengthen its enforcement activities further.

4.14.7 Efficiency of Collection

With the certified seed use estimated at 48 per cent and the legal use of FSS at 44 per cent, royalties are collected on average from 92 per cent of the seed used by farmers in Uruguay. The remainder of seed, on which no royalties are collected, is illegally traded 'brown bag' seed, which varies in use from 5 to 8 per cent of the total depending on the season. For certified seed, the royalties are returned 100 per cent to the breeder. FSS royalty is collected through an 'Extended Royalty Scheme' (the RCS) as described above. URUPOV estimates that the collection costs account for 7 per cent of the amount collected. The overall efficiency of the Uruguay royalty collection system is therefore 89 per cent, providing an excellent illustration of how tax incentives on certified seed and extended royalty schemes for FSS can contribute to the success of the industry.

One of the main success factors is the important role played by all of the stakeholders and their contribution in different ways to give Uruguay its respect when recognition of PBR is under consideration. The contribution of the stakeholders can be summarized as follows:

- *Farmers*: recognizing PBR and paying royalties for FSS;
- *Breeders*: continuously investing in and releasing new plant varieties;
- *Government*: giving the adequate legal framework and contributing to enforce PBR;
- *Multipliers and Distributors*: delivering the message to farmers about the importance of PBR and collecting information for the royalty collection system on FSS.
- *URUPOV*: gathering all breeders together in order to have a unique and strong voice and developing efficient royalty collection and enforcement systems.



5. Summary and Conclusions of the Working Group

The 14 territories examined in the present study demonstrate an extremely wide range of efficiency in the collection of potential royalties, ranging from 20 per cent (Canada) to more than 94 per cent (Sweden). The results indicate that the presence of a *sui generis* IP protection system for plant varieties is not enough, on its own, to assure efficient collection of royalties as many countries with such legislation in place do not demonstrate efficient collection procedures (for example, Canada, the United States, Spain, Poland and so on). In the most efficient territories, (Sweden, the United Kingdom) PVP is supported by enforcement tools including mandatory certification procedures, seed laws or strong government support. The highest efficiency of royalty collection occurs in territories where FSS remuneration is collected in addition to certified seed royalties. However, the results of the study have shown that contractual collection systems (for example, Argentina, Uruguay) can be just as effective as mandatory reporting systems (the United Kingdom, Sweden).

Whilst most of the states included in the present study reported that royalties are normally collected on seed (certified and FSS), Australia stands alone in that the breeders' intellectual property right is extended to the resulting crop instead of being operated on the seed. The Australian system provides an excellent example of how the extended provisions of the 1991 revision of the UPOV act can be used to safeguard the interests of breeders.

The overall indication of the study is that, whilst a broad range of collection systems exist, it is the prevailing market structure and legislative platform that determines the effectiveness of the system applied in any given territory.

The current membership of the Working Group, having discussed the future of the project, has recommended to the ISF Field Crops Section Board the next logical steps for the Royalty Systems study. In particular, the Working Group recommended two main areas of work:

1. Extension of the present wheat study to include more countries. Some European countries have a similar *modus operandi* to states already included in this report and extending the study to include, inter alia, Denmark, Finland, Ireland Netherlands, Belgium, would be a relatively straightforward step. The Working Group also believe that the study would benefit from the inclusion of additional countries in Eastern Europe and Asia, where IP protection mechanisms and royalty collection schemes appear to be less well developed than in Western Europe.
2. Creation of a parallel study on soybeans – a similar non-hybrid crop to wheat, but one that is prevalent in different climates and areas of the world; and a crop that is of significant economic value in these climatic regions.



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The completed report represents the culmination of many hundreds of man hours expended over a 3.5 year period. The Working Group presents the final report, through the ISF Field Crops Section Board to all ISF member states, companies and organizations in the hope and belief that it will provide a valuable source of reference to those nations, organizations and individuals that are seeking to review or create and implement royalty collection systems within their own territories.

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