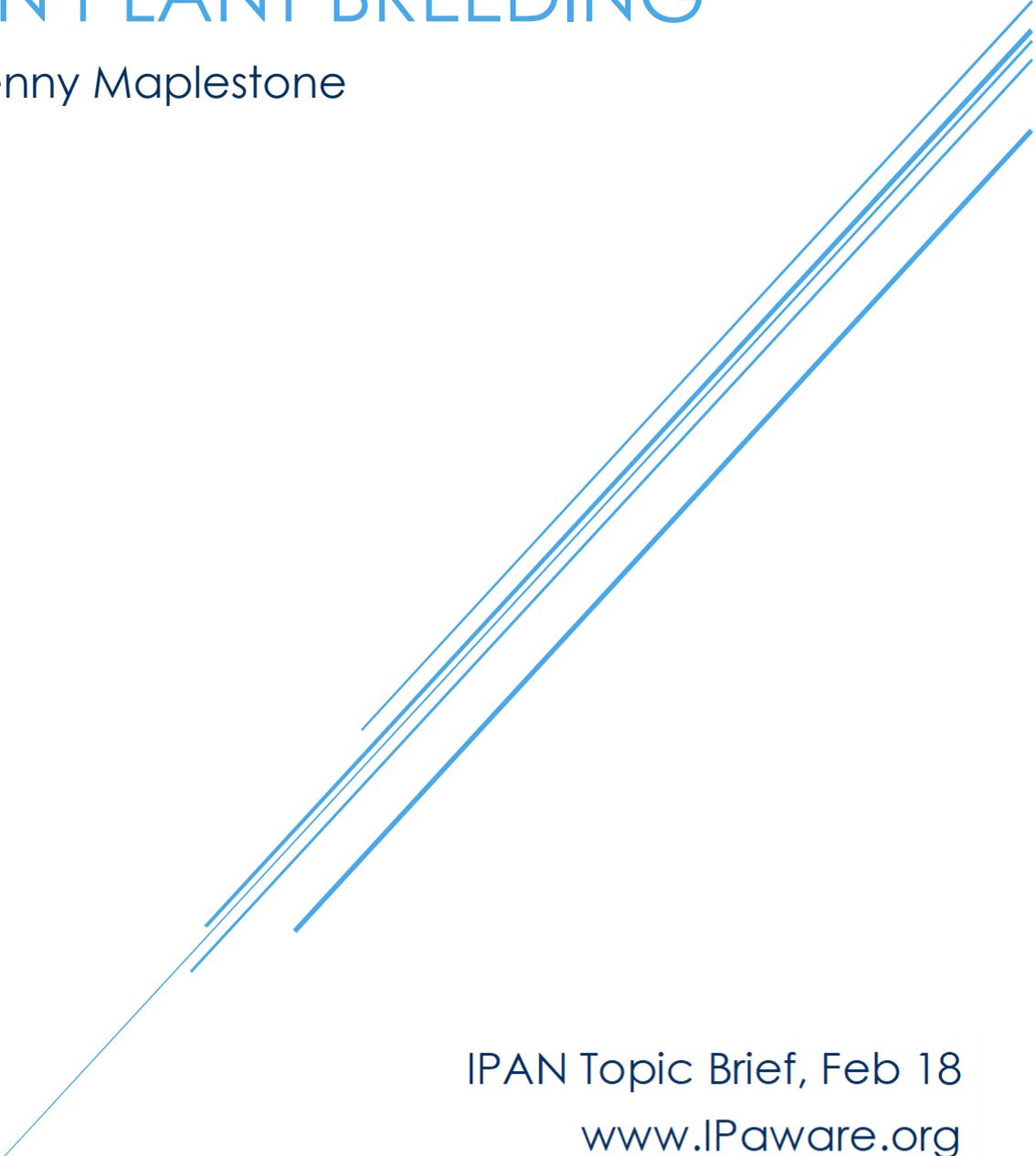


# IP IN PLANT BREEDING

Dr Penny Maplestone



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## Context

Plant breeding is the business and science of crop improvement. The industry develops new varieties of agricultural and horticultural crops with improved yield, performance and end-use quality. It is a complex, costly and skilled operation, requiring many years of upfront investment in research and development.

Improved crop varieties provide the essential foundation for the UK's £110bn food production chain. The economic benefits of plant breeding range from increased productivity at the farm level through to import substitution, export earnings and enhanced processing quality within the food and drink manufacturing sector. A study by DTZ's life sciences group found that the annual contribution of plant breeding in three key crops (wheat, barley and forage maize) exceeds £1 billion in additional value within the UK farming and food supply chain – equivalent to a 40-fold return on the annual royalty income on those three crops.

Crop genetic improvement is increasingly recognised as a key factor in delivering the sustainable increases in agricultural productivity needed to address global challenges of food security and climate change. Plant breeding also makes positive contributions to health & nutrition, sustainable use of resources, environmental protection & enhancement and the quality of life.

Commercial plant breeding provides the only route to market for such genetic improvement.

## Role of IP in the plant breeding sector

Plant breeding is funded in the UK and Europe predominantly through an internationally recognised system of IP protection known as Plant Variety Rights (PVR) or Plant Breeders' Rights (PBR). PVR gives breeders limited monopoly rights over the multiplication and sale of their varieties and allows a royalty payment to be collected on the use of each protected crop variety, both as purchased (certified) seed and farm-saved seed.

The PVR system also stimulates further research and improvement across the sector, through the 'breeder's exemption', which ensures that all protected varieties are freely available for use in future breeding programmes.

For most crop species, the British Society of Plant Breeders (BSPB) licenses production and collects and distributes seed royalties in the UK on its members' behalf.

## Relevant legislation

Plant Variety Rights were first established by an international agreement – the UPOV Convention – in 1961. In the UK, PVR were first introduced with the passing into law of the 1964 Plant Varieties and Seeds Act. Currently a UK plant breeder may hold UK PVR under the Plant Varieties Act 1997 or Community PVR under the Community Plant Variety Rights Regulation 2100/94 for the variety to be protected in the UK. Following the UK's withdrawal from the EU it is expected that UK PVR will be required for a variety to have protection in the UK.

## UK Plant Breeding Sector

The UK agricultural and vegetable breeding industry consists of some 70-80 enterprises, ranging from SMEs to large multinationals. The total royalty income to UK plant breeders, across all crop species, is relatively inelastic at around £60m per year. Plant breeders spend about a third of their royalty income on R&D, a much higher proportion than most industry sectors.

## Key IP issues for Plant Breeders

### Farm-saved seed

Under EU and UK PVR legislation, farmers are permitted to re-sow the produce of their own harvest on their own holding to produce the next crop of a protected variety, subject to the payment of 'equitable remuneration' to the breeder. 35-60% of the UK crop is grown from farm saved seed, depending on the crop. This reduces the potential royalty income to breeders as payments for farm-saved seed use are approximately 50% of the royalty payable on certified seed of the same variety. The legislation strives for a balance between the interests of

users and rights-holders but breeders have long argued that the lower payment rates for farm-saved seed do not fairly reflect the genetic value contained in the variety, which is the same regardless of the type of seed used.

While the system for collecting royalties on certified seed is relatively efficient and cost-effective, the collection of payments on farm-saved seed is more difficult to achieve and to enforce. Since the UK farm-saved seed payment system was introduced in 1996, the plant breeding industry has invested in a range of initiatives to improve compliance, from increased monitoring and enforcement to information campaigns such as the FAIR PLAY campaign. It now has an established system collecting £10m annually but this still falls some way short of the total potential income from farm-saved seed that is due from farmers using it.

## Patents

In Europe a variety cannot be the subject of a patent but traits and technologies can be patented, which can effectively confer patent protection on varieties including those traits and/or derived by those technologies. Breeders in Europe are increasingly making use of the stronger IP protection that patents afford as new plant breeding methods are introduced and the R & D cost of innovation rises. The patent/PVR interface is an evolving and important issue for the global industry and legislators, seeking to find a balance between access to germplasm for breeding and the needs of rights holders to protect their investment. Recent developments to improve legal certainty include clarification that 'essentially biological processes' may not be patented and that patent protection should not extend to the products of 'essentially biological processes'. The European Seed Association has a (non-exhaustive) database, 'PINTO' which links crop varieties with patents.

## Brexit

Plant breeders seeking to protect their varieties in the UK have predominantly made use of EU PVR for the last 20 years, which gives them protection in all EU Member States for the cost of a single application. When the UK leaves the EU, those EU PVRs will cease to confer protection in the UK. The UK Government has plans for national legislation to ensure that varieties with EU PVR are guaranteed continued, equivalent protection in the UK at and beyond the point of the UK's departure. After the UK has left the EU, it is expected that

separate and parallel systems for EU PVR and UK PVR will operate. The extent to which there can, and will be, collaboration between the two systems will be determined by the outcome of the negotiations between the UK and the EU. Plant breeders are concerned that cost increases from the need for dual applications may reduce the number of new varieties that they can make available to the UK market.

PVR trademark 

In the UK, the PVR campaign aims to raise awareness and understanding of how IP protection within the plant breeding industry is delivered and how it sustains investment and innovation in the industry. Central to the campaign is the PVR trademark. The trademark may be seen on seed bags, and packaging, stationery, invoices, field boards, web sites, seed catalogues, in fact anywhere connected with the development, sale and use of high quality seeds of varieties protected by Plant Variety Rights. The mark demonstrates that the company or organisation using it supports the principles of investment in breeding innovation and its delivery through high quality seed and that the variety is the result of years of research, innovation, investment, testing and evaluation.

## References for further information:

- [Find out all about the science and business of plant breeding](#)
- [British Society of Plant Breeders](#)
- [PVR trademark](#)
- [FAIR PLAY on farm-saved seed](#)
- [UK Plant Variety Rights](#)
- [Community Plant Variety Rights Office](#)
- [International Union for the Protection of New Varieties of Plants \(UPOV\)](#)
- [European Seed Association PINTO data base of varieties with patent protection](#)
- [Protecting and promoting innovation – video explaining PVR](#)