Brexit priorities for UK plant breeders

The UK’s decision to leave the EU brings an inevitable period of flux and uncertainty over precisely what the future holds for British agriculture in terms of support policies, trading arrangements, farming regulations and access to labour. The outlook for the plant breeding and seeds sector will depend critically on these discussions and the wider negotiations taking place on the UK’s future relationship with the EU and the Single Market.

Given the high level of pan-EU activity in plant breeding, variety registration, seeds marketing and other crop-related research and innovation, these discussions will determine the extent to which UK independence marks a significant departure from current trading, R&D and regulatory arrangements.

Whatever the outcome, Britain’s farmers will need continued access to the benefits of improved crop varieties, tailored to UK conditions, to maintain the sector’s competitiveness, resilience and sustainability on a global stage.

Since the EU referendum vote in June, BSPB has acted swiftly to assess the specific implications for the UK plant breeding industry, to seek legal advice on how Brexit might affect key issues such as Plant Variety Rights and variety registration, and to consult widely across the membership.

More than ever, it is vital that UK policy makers – and particularly those responsible for setting and negotiating the conditions of Brexit – understand the value and importance of supporting a vibrant, locally-based plant breeding industry, not only for the competitiveness of our farming and food industries but also for the wider economy, for our health and quality of life, and for the environment.

BSPB has identified five key Brexit priorities, and is engaging proactively with the UK Government, other industry organisations and EU partners to promote the specific conditions and requirements for a competitive and innovative British plant breeding industry outside the EU.

Continued on the back page.
BSPB marks 50 years – 1966-2016

It is 50 years since BSPB’s predecessor body, the Plant Royalty Bureau, was established to collect seed royalties on behalf of plant breeders. Today, BSPB combines royalty collection with a broader role in industry representation and the organisation of variety trials.

The past 50 years have seen major changes in UK crop production: a doubling of cereal yields and sugar production, and a reversal of the UK’s historical dependence on imported bread wheat; oilseed rape established as the break crop of choice, and forage maize adapted to UK growing conditions.

The pace of change continues today, with major advances in quality wheat yields, healthier varieties of barley, oats, beans and oilseed rape, improved plant architecture in field peas, the development of new herbicide tolerance and hybrid breeding systems, and new sources of pest and disease resistance introduced into UK varieties.

Through continuous investment and innovation, plant breeding has underpinned these changes by developing improved varieties to meet constantly changing agronomic, market and policy demands.

To mark the Society’s half century, this issue of Plant Breeding Matters charts a timeline of key developments in the plant breeding sector, alongside significant world news events and statistics.

The next 50 years

As part of its 50 year celebrations, BSPB also hosted a recent seminar in London at which three guest speakers were invited to consider some of the factors likely to influence the plant breeding industry over the next 50 years, from future developments in IP protection to global trends in food production and consumer attitudes towards new breeding technologies.

Specialist IP lawyer Joel Smith was optimistic about the opportunities for the UK’s £14.8bn agri-tech sector to harness a rapidly advancing knowledge base in genetics, precision engineering and data science to drive growth and innovation across the £108bn agri-food chain.

In particular, he highlighted the potential for the UK to rebalance R&D investment and reinvigorate the science base in the crop protection and biotechnology sectors, where progress had been stifled by a politicised and over-precautionary EU regulatory regime.

But Mr Smith, a partner at law firm Herbert Smith Freehills, which hosted the seminar, emphasised the need for effective IP protection to exploit these opportunities, particularly in relation to the development of new crop varieties and breeding tools. He identified three key challenges ahead for protecting innovation in the plant breeding sector.

The first, immediate priority was to understand the implications of Brexit and ensure a seamless transfer of Plant Variety Rights protection from EU to UK level.

Secondly, there was a need to recognise that plant breeding methods are changing and that alternative IP models may be needed to sustain investment and innovation, for example in relation to new genome editing and trait development techniques. This would include identifying potential solutions to ensure compatibility of PVR with other IP rights such as patents, copyright, trade secrets and data protection.

The third challenge identified by

1966-1975

1966
- Bobby Moore leads England’s footballers to victory in the 1966 World Cup
- Plant Royalty Bureau formed after UK enacts the Plant Varieties & Seeds Act 1964, establishing a legal framework to collect royalties on protected crop varieties

1967
- Introduction of monogerm sugar beet seed paves the way to total mechanisation of the crop

1968
- Concorde makes its maiden flight in March
- Norman Borlaug wins Nobel Prize in recognition of his wheat breeding achievements and the alleviation of hunger around the world

1969
- Britain goes decimal in February
- Wheat variety Maris Huntsman offers 20% yield advantage over previous market leader Capelle Desprez

1970
- Pint of beer costs 10p
- Norman Borlaug wins Nobel Prize

1971
- Wimbledon men’s singles prize money £5,000

1972
- Britain declares a state of emergency and introduces a three day week in January 1974 following industrial action by coal workers

1973
- Ted Heath takes the UK into the EEC
- Wheat variety Maris Huntsman offers 20% yield advantage over previous market leader Capelle Desprez

1974
- Average UK house price £10,208

1975
- Plant Royalty Bureau moves premises from Regent Street in Cambridge to new offices in Market Street, Ely

- 1973-76: Seed certification schemes become statutory in the UK as part of EC accession arrangements

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Mr Smith was the need to resolve the long-term issue of access to plant genetic resources by standardising an increasingly complex web of international treaties and inter-country arrangements intended to promote access and benefit-sharing.

Kevin Gorman, Scientific Affairs Manager at UK-based technology company Oxitec Ltd, described the development and application of GM insect technology to control mosquitoes in areas where they are vectors for human diseases such as Dengue fever and the Zika virus.

By releasing males of a self-limiting strain of the *Aedes aegypti* mosquito – whose offspring die before reaching adulthood after mating with wild females – he explained that the technology was capable of reducing the wild population below the level needed to transmit disease. Field trials in Brazil, Panama and the Cayman Islands had achieved more than 90% suppression of the mosquito population, a global success story for UK-developed technology.

Mr Gorman indicated that this was a rapidly advancing scientific field, with new techniques allowing genetic segregation of males and the potential application of targeted 'gene drive' technology to induce rapid and persistent spread of mortality within a species. He added that Oxitec’s focus over the next five years would include a strong move into agricultural markets, where laboratory examples of game-changing technologies were just a few years away.

Given the wider controversies surrounding GM technology, Mr Gorman also provided valuable insights into effective public outreach and engagement, which needed to be case-specific, transparent and proactive, focused on the benefits for individual people and communities, and delivered by locally-based champions.

Rounding off the presentations, Allan Wilkinson, head of food and agriculture at HSBC Bank plc, predicted a very positive future for plant breeding innovation in the years to come, as the combined impact of population growth, pressure on finite land and water resources, and a shift in affluence from West to East would place unprecedented demands on global food production and trade.

But while the pace of change in agricultural technologies was set to accelerate, the food supply chain would be subject to increased scrutiny.
Meet the BSPB team: **Tony Richardson, Field Officer**

Tony Richardson joined the BSPB Executive in April 2016 as Field Officer for Northern England, Northern Ireland and Scotland, taking over from Henry Taylor who has left the Society after 11 years in the post.

Based in rural North Yorkshire, Tony provides a local point of contact for seed merchants, processors and farmers on all seed royalty and licensing issues. He is part of BSPB’s dedicated team of auditors whose role is to check that royalty income collected by BSPB each year tallies with the amount of certified seed produced and sold by licensed seed merchants, and with the farm-saved seed declarations received from seed processors and individual farmers.

Together the audit team covers many thousands of miles each year to carry out inspections at the premises of licensed merchants and seed processors.

A former farm inspector with the Rural Payments Agency, Tony believes there is widespread recognition of the need to support continued innovation in plant breeding.

“One of BSPB’s main tasks is to collect royalties on certified and farm-saved seed. This is the investment stream breeders and their customers depend on for future crop improvement. Field officers are in the front-line for BSPB in dealing with farmers and the seed trade, and the vast majority of people I deal with are co-operative and supportive of the need to maintain investment in UK-based plant breeding.”

Outside of work Tony pursues a wide range of interests including shooting, fishing and home renovation. Tony is also a lifelong vintage tractor and machinery enthusiast and has completed several large restoration projects.
FSS rules apply to cover crops

As part of the FAIR PLAY campaign, BSPB is reminding growers that using farm-saved seed of eligible varieties in cover crop mixtures is subject to the same seed regulations and FSS rules as harvested crops.

Interest in the use of cover crops among arable farmers has increased recently in response to CAP greening requirements and as research has demonstrated the rotational benefits of cover crops for soil quality, reduced nutrient losses, and improved weed and disease management.

This renewed interest has been reflected in an increasing number of queries received by BSPB from individual farmers in relation to the use of combinable crops such as peas, oats and barley in cover crop mixtures.

BSPB is therefore advising farmers and their advisers that seeds regulations and farm-saved seed rules apply regardless of whether a crop is taken to harvest, and that when sowing a cover crop mixture which includes seed of PVR protected varieties, farmers must use either new seed purchased from a licensed seed merchant or farm-saved seed produced on their own holding.

Under the FSS rules, farmers cannot sell, barter, exchange or in any other way transfer farm-saved seed between holdings.

In addition, the use of eligible varieties as farm-saved seed in cover crops must be declared to BSPB and FSS payment made according to the proportion of eligible varieties in the mixture and the area sown. A list of eligible varieties and payment rates by crop species is available on the FSS section of the BSPB website, or farmers can contact the BSPB helpline on 01353 653209 for advice.

Farmers purchasing new seed for use as cover crops should ensure that this is certified seed bought from a licensed seed merchant (for peas, oats and barley) or if they are buying a cover crop mixture which may include a combination of regulated and unregulated species, that the bag carries an official green label stating ‘mixture of seed for green cover’.

BSPB chief executive Dr Penny Mapleson said:

“The FAIR PLAY campaign was established by BSPB and the farming unions to promote a collaborative, industry-wide approach to ensuring all farmers contribute fairly for the economic benefits of using farm-saved seed.

“By ensuring farmers are clear about the rules on FSS use, the FAIR PLAY campaign has come a long way in tackling the gap in FSS payments and supporting continued investment in UK-based breeding programmes.

“The need for genetic innovation has never been greater to maintain the competitiveness and resilience of UK crop production, and it is vital therefore that all farmers understand their legal obligations on FSS to safeguard the development of improved varieties, bred for UK conditions and markets.”

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**FAIR PLAY ON FARM-SAVED SEED**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1996</td>
<td>Tony Blair and New Labour come to power in May 1997 after 18 years of Tory Government</td>
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<tr>
<td>1997</td>
<td>UK produced 15.4m tonnes of wheat at £72.12/t</td>
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<td>1998</td>
<td>In October 1999, the London Eye became a new landmark on the London skyline</td>
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<tr>
<td>2000</td>
<td>Wimbledon men’s singles prize money £525,000</td>
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<td>2001</td>
<td>Average UK house price £153,778</td>
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<td>2002</td>
<td>Thousands died on Boxing Day 2004 after huge waves crashed into coastal areas across south east Asia</td>
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<tr>
<td>2003</td>
<td>London’s transport system rocked by terror attacks in July 2005</td>
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<tr>
<td>2004</td>
<td>BSPB establishes FAIR PLAY campaign to promote and develop new varieties and pay the farmers who save seed, ensuring continued investment in improved varieties, bred for UK conditions and markets</td>
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<tr>
<td>2005</td>
<td>Martin Johnson leads England to victory in the 2003 Rugby World Cup in Australia</td>
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<td>2006</td>
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**First collection of payments on farm-saved seed by BSPB**

UK Plant Varieties Act implements 1991 revisions to the UPOV Convention

Crop Evaluation Ltd established as the new vehicle for delivery of cereals and oilseeds Recommended Lists

European Seed Association (ESA) formed, with headquarters in Brussels

Perennial ryegrass variety AberDart is the first ever heritage variety to win the prestigious NIAB Variety Cup

First rhizomania-resistant sugar beet varieties available to UK growers

BSPB establishes FAIR PLAY campaign to promote and develop new varieties and pay the farmers who save seed, ensuring continued investment in improved varieties, bred for UK conditions and markets.
Plant Variety Rights (PVR)

EU Plant Variety Rights were first introduced in 1995 and virtually all seed royalties on UK-grown crop varieties are now collected under this EU-wide system. Continued investment in UK plant breeding will depend on a seamless transfer of all EU-protected varieties to UK-based protection at the point of Brexit, with the same variety name, priority and duration of rights.

Variety registration

A single application under the current EU-wide variety registration system allows new varieties to be listed on the ‘common catalogue’ and marketed in all EU member states. This system has served the industry well and supports access to crop innovation – BSPB will seek solutions which minimise additional costs and duplication of effort, such as mutual recognition of common catalogue and UK-listed varieties.

Seeds marketing

UK seeds marketing legislation is already in place, broadly equivalent to EU-wide standards. BSPB is seeking no significant changes to the current system which has served the industry well and provides an independent assurance to growers of the purity, quality and varietal integrity of certified seed. To minimise costs and disruption for all concerned, BSPB will press for mutual recognition of seed marketing standards and free movement of seed to continue without restriction between the UK and EU.

GM and New Breeding Techniques (NBTs)

BSPB has long expressed concerns that research and investment in the development of GM crops and new genome editing techniques have been stifled by a shift towards unscientific or politically motivated regulation at EU level. Leaving the EU presents a fresh opportunity for the UK to demonstrate its commitment to providing an enabling environment for agricultural science and innovation, and that it is a good place to invest post-Brexit.

Research and Development

Our response to the global challenges of food security, climate change and sustainable development will require international scientific collaboration and knowledge exchange. From a research perspective, the UK must safeguard access to EU R&D funding programmes, maintain straightforward research collaboration between the UK and other EU countries, and enable the UK to continue to contribute and benefit from the shared resources, data and infrastructure of the pan-European agri-science base.