British Society of Plant Breeders

60 Years of Representing Plant Breeding in the UK

This year marks a significant milestone for the British Society of Plant Breeders as we celebrate 60 years of promoting innovation, collaboration and excellence in UK plant breeding. From our beginnings in the 1960s we have championed pioneering breakthroughs in crop varieties such as higher-yielding, disease resistant and novel breeding techniques which deliver reliable modern varieties with lower inputs and greater food security.

Steph Spiers
Head of Business Operations

BSPB has been proud to stand at the heart of progress in agriculture. Together with our members and a wide network of valued stakeholders including breeders, farmers, researchers, policymakers and partners across the food supply chain, we have helped shape the frameworks, partnerships and scientific achievements that underpin a productive, sustainable and resilient farming sector. From securing plant breeders' rights and establishing farm-saved seed systems, to supporting the development of innovative, high-performing and climate-resilient crops; BSPB and its members have played a vital role in delivering benefits across the UK and beyond.

As we celebrate these achievements, we also look forward with optimism and ambition, continuing to work in partnership to meet the challenges of the future and to ensure that plant breeding remains central to a thriving agricultural industry.

Read on for a journey through the importance of plant breeding over the past sixty years, including words from our chair, Jonathan Tann, the Maltsters' Association of Great Britain's Executive Director, Julian South, and British Sugar.

60 Years of Transformation and the Promise of More to Come

Over the past six decades, plant breeding has been a transformative force in UK agriculture. By systematically improving crop genetics, breeders have delivered major gains in productivity, resilience, and quality; helping to underpin national food security while supporting farm profitability and environmental sustainability.

Jonathan Tann
BSPB Chair

A Legacy of Productivity and Food Security

Since the 1960s, plant breeding has significantly increased crop yields across the UK's arable sector. Modern wheat varieties, for example, now yield more than double they did half a century ago, thanks to improvements in genetics combined with agronomy. Similar gains have been seen in crops such as oilseed rape, barley, sugar beet and maize.

These advances have enabled the UK to produce more food on a relatively stable land base, reducing reliance on imports and ensuring a steady supply of safe, affordable food for consumers. Improved crop performance has also helped farmers remain competitive in a challenging global market.

Enhancing Resilience and Reliability

UK agriculture faces a more variable climate, with increasing pressure from extreme weather events, pests, and diseases. Plant breeding has played a vital role in strengthening crop resilience. Disease resistant varieties, such as those with improved resistance to septoria in wheat or Turnip Yellows Virus in oilseed rape, have reduced crop losses and improved yield stability.

Breeding for traits like winter hardiness, drought tolerance, pod-shatter resistance and stronger root systems has helped crops better withstand environmental stress. Plant breeding has been central to driving sustainable and more resilient farming systems. Higher-yielding crops mean more output per hectare, reducing the pressure to bring additional land into production and supporting biodiversity conservation.

1966

The Common Catalogue of plant varieties is created by the EU, which becomes important to the UK when it joins three years later.

Monogerm sugar beet seed is introduced and paves the way to total mechanisation of the crop.

The Nobel Peace Prize is awarded to Norman Borlaug following his advancements in wheat breeding that led to the 'Green Revolution'.

Maris Huntsman wheat offers 20% yield advantage over the previous market leader and offers good resistance to rust and mildew.

1976

Golden Promise, bred in the early 1960s using gamma ray mutation, is the UK's leading spring malting barley variety.

Semi-leafless field pea development revitalises an important home grown protein source.

UK flour millers' usage of home grown wheat exceeds 80% for the first time.

The Plant Royalty Bureau and BAPB merge to form the BSPB.

1986

'Double-low' oilseed rape varieties are introduced and deliver improved end-use quality for food and animal feed.

UPOV Convention revised to recognise the right of plant breeders to recover a royalty on farm-saved seed of protected crop varieties.

EU Plant Variety Rights are introduced and a Community Plant Variety Office is established in Angers, France.

Cannon is the first hybrid oilseed rape variety to be added to the National List.

First collection of payments on Farm Saved Seed by BSPB.

1996

Ballerina, a Rhizomania resistant variety of sugar beet is listed for special use.

The UK implements many of the revisions from the 1991 UPOV convention and the EU's Legislation on plant breeding into law.

Mendel is the first clubroot resistant oilseed rape variety to appear on the Recommended List.

Euroseeds (formally the European Seed Association) is formed with a headquarters in Brussels.

2006

NIAB report shows around 90% of the increase in UK average cereal yields over the past 25 years can be attributed to innovation in plant breeding.

BSPB licensed to organise statutory variety trials for National List purposes.

Amaline, a TuYV resistant oilseed rape variety is introduced by Limagrain.

Pod shatter resistance trait introduced for oilseed rape.

2016

The Chemistry Novel Prize is awarded to Emmanuelle Charpentier and Jennifer Doudna for developing the CRISPR Cas9 genome editing process.

An independent report by agricultural consultants ADAS concludes that plant breeding is a major contributor to more sustainable agriculture and food production.

The announcement of the EU - UK Common Understanding intends to create a common sanitary, phytosanitary area and aid the removal of trade and movement barriers.

The Precision Breeding Act is passed in the first formal step to creating a regulatory pathway for precision breeding in England.

2026

The first gene edited barley variety to be approved under the UK's new precision breeding rules was produced by Rothamsted Research, cutting livestock emissions and boosting feed efficiency.

The UK's Genetic Technology regulations took effect and provided a framework for using precision breeding techniques, including gene editing.

Improving Quality and End-Use Performance

Plant breeding has greatly enhanced the quality of UK crops. Milling wheats with superior baking properties, malting barleys tailored for the brewing or distilling industry, vegetables adapted to markets, and oilseed rape varieties with improved oil profiles are just a few examples.

These quality improvements have strengthened the UK's food and drink sectors, supporting both domestic consumption and export markets, while ensuring consistent performance for processors and manufacturers.

Jonathan Tann
BSPB Chair

British Sugar: An Industry Voice on Plant Breeding

Plant Breeding as a "Vital Tool" in the UK Sugar Beet Industry:

"For many decades, plant breeding has been a vital tool utilised by the UK sugar beet industry. Historically, breeding has helped combat diseases like Rhizomania, fungal leaf diseases and Beet Cyst Nematode that can all have a detrimental impact on crop yields.

More recently, focus has been on producing traits to combat virus yellows and syndrome 'basses richesses' with some significant improvements being brought to market. Modern sugar beet breeding techniques have not only contributed towards yield improvements but have also provided environmental benefits through more efficient use of water and fertiliser; lowering the crop's environmental impact.

We look forward to further advances in plant breeding, including precision breeding, that will support and strengthen the UK sugar beet sector for the future".

Importance of 60 Years of Plant Breeding for Maltsters

Plant breeding has been fundamental to advances in the malting industry over the past 60 years, with continuous delivery of barley varieties with higher, more predictable malting quality and the agronomic resilience needed for a reliable supply chain. Plant breeding has steadily delivered barley varieties with improved processing performance both in the maltings and also with end users in brewing and distilling. This has enabled a consistent improvement in raw material year after year.

Genetic improvement has transformed key quality traits. Breeding has raised extract potential, the industry's most valuable parameter, while reducing β-glucan to improve brewhouse efficiency. Barley enzyme levels have been strengthened to support higher fermentability, essential for both brewing and distilling. Grain nitrogen has also become more consistent, enabling maltsters to meet tight brewing and distilling specifications.

Equally important has been the development of varieties tailored to end-use sectors, from brewing types to developing traits such as 'Non-Glycosidic Nitrile' for the distilling industry and breeding distilling leaders such as Laureate. Modern spring barley varieties now carry stable genetics for many malting traits, reflecting decades of targeted selection. These advances have underpinned the quality, efficiency and global competitiveness of the UK malting industry.

Advanced plant breeding methods are now increasingly vital for the malting industry's future. Precision-breeding tools such as genomic selection and doubled haploids will allow breeders to fine-tune complex traits like extract, enzyme balance, β-glucan and grain nitrogen with far greater accuracy. High-throughput phenotyping will shorten breeding cycles, accelerating the delivery of climate-resilient, low-input, elite varieties. These innovations will ensure the industry can maintain consistent malting performance while meeting rising sustainability, carbon-reduction and supply-chain demands.

Dr. Julian South
Executive Director, MAGB

VCU Trials: Enhanced & Strengthened
Structural, Scientific & Governance Improvement

The UK's Value for Cultivation and Use (VCU) system has undergone substantial modernisation, representing one of the most significant periods of progress in the history of statutory variety evaluation. Across all crop sectors, breeders, trial operators and stakeholders have contributed to a system that is now more robust, transparent and scientifically aligned than at any previous time.

UK Breeding programmes have delivered notable genetic gains, with clear improvements in yield potential, disease resistance and end-use quality. Advances have been complemented by improvements in trial execution. A major development has been the improved integration of VCU datasets into the Recommended List (RL) and Descriptive List (DL) processes. The system has evolved to regulatory landscapes, becoming increasingly data-driven, transparent and aligned with the needs of the wider industry.

Overall, the VCU framework provides a farmer-focus; with robust scientific datasets that are an operationally consistent foundation for ongoing genetic progress across both major and minor crops.

VCU Enhancements include:

- *Development of stronger, more resilient varieties with clearer genetic differentiation.*
- *A more rigorous and professionally executed VCU trialling system.*
- *A data-driven and farmer-orientated national testing environment.*

Amenity Grass Trials

Integration of Digital Turf-Assessment Technologies

The amenity grass sector has embarked on a significant modernisation journey with the introduction of digital turf-assessment technologies. The Sports Turf Research Institute (STRI) and the Amenity Crop Group have piloted lightbox systems, integrated NDVI capture, and digital canopy assessment tools. This shift is a major departure from reliance on visual scoring. Digital assessment enables objective, replicable measurement of turf performance attributes including live ground cover, density, wear tolerance and surface quality. This transition marks a major step forward for amenity trials, positioning BSPB and STRI as leaders in innovation and modernisation within this specialised field.

Hemp

Regulatory Modernisation and International Alignment

BSPB has played a key role in modernising industrial hemp regulation; challenging to raise the permissible THC threshold to 0.3% and bringing the UK into alignment with the EU, USA, Canada and China. This change significantly expands variety choice, enhances agronomic performance and supports market growth. APHA has now formally separated industrial hemp (THC ≤ 0.3%) from medicinal cannabis (THC ≥ 0.3%), providing crucial regulatory clarity for breeders, growers and processors. The reforms improve competitiveness, enable better market access, and support sustainability objectives through hemp's strong carbon-capture performance.

Maize

Modernisation of VCU Testing

With the introduction of a three-cut system for forage maize (replacing the historical one-cut to two-cut framework) provides a clearer statistical comparability. In parallel, grain maize trials have been strengthened, reflecting growing domestic interest in grain systems, particularly in the context of post-OSR rotational changes.

Sugar Beet

A Stronger, More Transparent National Listing Process

The sugar beet sector has implemented one of the most comprehensive modernisation programmes seen in UK crop evaluation. The system has transitioned to a streamlined Variety Listing (VL) only structure with defined harvest specifications, annual tendering of trial operators and stricter site-selection rules. Trial quality is achieved by consistent pelleted seed supply, enhanced statistical frameworks, improved impurity measures and strengthened audit processes.

Wheat

Scientific & Governance Advances in a Complex Pathogen Landscape

Wheat evaluation has evolved in response to emerging pathogens, changing disease dynamics and heightened demands for statistical rigour. Shifts in yellow rust populations have necessitated greater separation between seedling and adult-plant resistance data. The appearance of new pathogen races (notably around 2024–2025) has led to more urgent and precise classification of disease responses. BYDV-tolerant varieties have entered the system, expanding genetic tools for managing virus pressure. Micro-milling and quality-strip networks have been expanded, supporting more reliable Group 1 and 2 assessments. These changes have collectively strengthened trial resilience, improved disease interpretation and enhanced confidence in the resulting classifications.

Pulse Trials

Introduction of Dedicated Pathology Controls

The implementation of dedicated pathology controls within pulse VCU trials has allowed for advancement in the evaluation of peas and beans; a development driven collaboratively by BSPB, PGRO and NIAB. Pulse trials operate under a disease-calibrated framework that enables more accurate measurement of varietal differences in disease susceptibility and yield resilience.

Minor Crops

Introduction of Dedicated Pathology Controls

The creation of a dedicated Minor Crops Crop Group has been instrumental in improving the visibility and support available to breeders working with small-acreage species. This group has facilitated focused discussions on DUS challenges, VCU methodology, registration barriers and policy issues affecting specialist crops.

Oilseed Rape

A Transformation in WOSR Evaluation

Winter Oilseed Rape (WOSR) has seen profound advancements across breeding, VCU methodology, disease evaluation and governance. There have been stronger fungicide and insecticide programmes that stabilise disease pressure with clear differentiation of genetic performance. Improved verification of clubroot resistance and other disease-resistance claims. Major breeding progress in TuYV resistance, pod-shatter control, standing power and agronomic stability. Integration of advanced statistical methods such as shrinkage-based yield analysis from BioSS.

Barley

Modernised Pathways and Improved Disease Assessment

The barley sector has delivered major improvements across malting pathways, disease assessment and quality testing. Consolidation of a robust three-year progression route from VL to P1/P2 to full approval is supported by closer collaboration between MBC, MMG, RL Committee and MAGB. Recognition of rising challenges from Rhynchosporium and net blotch have prompted further refinement of disease weightings. Entry of BYDV-tolerant hybrids into the system, improvements in thousand seed weight (TSW) accuracy, screening consistency, hybrid management and quality-strip alignment have all resulted in a more transparent, scientifically credible and market-aligned barley-testing framework.

Oats

Oats – Improved Understanding of Site-Driven Variation

The oat sector has increasingly recognised the strong influence of environmental and site-specific factors on key quality traits, including specific weight, hullability and screenings. Differences between northern and eastern sites highlighted the need for more sophisticated data interpretation to prevent varieties being unfairly penalised due to site-driven effects. These measures have protected varietal integrity, improved decision-making and supported a more stable, market-aligned testing environment.

Looking Ahead: Plant Breeding in the Next 60 Years

The future of plant breeding in the UK holds even greater potential, driven by advances in science and technology.

Jonathan Tann
BSPB Chair

Climate Adaption

As climate change accelerates, breeding will be essential in developing crops that can thrive under new conditions, with greater tolerance to heat, drought, or flooding. Faster breeding cycles, supported by genomic tools, will allow breeders to respond more quickly to emerging challenges.

Enhancing Resilience and Reliability

There is growing interest in breeding crops with enhanced nutritional value, such as higher protein content, improved fatty acid profiles, or increased micronutrients. These innovations could contribute to healthier diets while opening new market opportunities.

New Breeding Technologies

The development of gene editing and advanced genomic selection techniques offers the potential to accelerate innovation. These tools enable more precise and efficient breeding, unlocking traits that were previously difficult or time-consuming to achieve.

Supporting a Resilient Food System

Plant breeding will remain central to ensuring the UK's food system is resilient, productive, and sustainable. By delivering crops that meet the needs of farmers, consumers, and the environment, breeders will continue to play a critical role in shaping the future of agriculture.

Conclusions

Over the last 60 years, plant breeding has helped transform UK agriculture, boosting yields, improving resilience, and supporting sustainability. As the sector faces new challenges, from climate change to evolving consumer demands, continued investment in plant breeding will be essential. The next generation of innovations promises not only to sustain these gains, but to deliver even greater benefits for farmers, the environment, and society as a whole.