SUMMERS’ TIME

RAGT’s Richard Summers, the new chairman of the British Society of Plant Breeders (BSPB), outlines what he hopes to achieve and his concerns on the gap between public-funded research and commercial breeding

Challenges

What do you see as the key challenges for growers in the next 15 years?
- Market volatility and remaining profitable will be foremost in growers’ minds.

Clearly the potential loss of pesticides access (such as triazoles as potential endocrine disruptors), tighter nitrogen legislation, stagnating on-farm yields for key crops, the potential impact of climate change and soil health issues will add to the challenges.

What role can breeders have in meeting these challenges?
- Our role is to provide new varieties that will allow growers to meet the challenge of increasing production and responding to environmental challenges. This will be achieved by continued investment in intensive field breeding programmes and applying advances in plant science.

Incidentally, plant breeding requires very high levels of research spending, typically accounting for one-third of total revenue, significantly higher than the 15% committed by the pharmaceutical sector and the 10% by the software industry.

The incremental improvement in varietal performance, that has been so successful over the past 30 years, can continue so long as breeders receive sufficient return on research investment (largely through royalty payments). There also needs to be a viable competitive industry with several companies competing for market share can continue to exist.

Commercial breeders have the only viable link between research and farmers’ fields.

Future breeding benefits

Where do you see UK wheat breeding taking us in the future?
- Wheat breeding in the UK has a great opportunity to provide not just new and innovative commercial varieties to help the country’s farm businesses, but also lead the world by benefiting from the unworlded world-leading plant research with the practical application of the rapidly developing field of genomics.

This will be important for wheat production in the UK and globally because any advance in varietal performance here can be used by breeders around the world to improve their variety base.

Plant variety rights (PVR) legislation, which protects breeders intellectual property and allows royalty collection on varieties, also allows breeders to use competitor varieties to create new varieties that can then also be protected by PVR. This creates a virtuous circle that helps ensure breeders continue producing improved varieties and have access to interesting diversity.

But it is a circle dependent on royalty payments to give breeders an income to invest in research and drive the discovery of the next wave of improved varieties.

Is wheat breeding the solution to the wheat yield barrier?
- It will be one of the solutions. Clearly without the continued increase in yield potential of new varieties wheat productivity in the UK could, in fact, have started to decline during the last decade.

Thus continued development of new high-yielding wheat varieties able to withstand increased stresses due to disease and environmental effects will be essential.

That said, I think soil health and compaction, shorter rotations and the increased absence of a break crop such as peas or beans to fix nitrogen, all play a part in the observed yield plateaux, coupled with farmer decisions to manage their crops for maximum financial return not necessarily maximum yield.

In addition, to breeding, agronomy and physiology research to address these agronomic issues will be paramount.

When would growers expect to see the benefits from the genome being mapped?
- Growers are already seeing the benefits. Genomics has been a developing science over the past two decades and has been responsible for the development of molecular markers. Two recent RAGT varieties in Recommended List trials, Stelfall and Ichabod, contain genes for orange blossom midge resistance, eyespot resistance, yellow rust and slow apical development, which have been enriched and tracked in the breeding process by the use of markers.

Do you see GM having a role in wheat breeding, for example breaking the yield plateau?
- In my opinion, GM is a research tool that could provide important characteristics not accessible to breeders through conventional breeding. Clearly all technology needs to be controlled by relevant legislation, but if we are to meet the sustainable productivity targets over the next 15-30 years, it will be essential for breeders to have all the available tools at their disposal.

RAGT, as a breeding company of UK adapted commercial varieties, is most unlikely to be a provider of GM traits, but breeders who work for the company would be able to deliver GM specific traits in adapted varieties if legislation permitted.

One of the biggest targets for GM has to be our ability to increase photosynthetic efficiency and mitigate the negative effect of increased night temperatures due to climate change on crop yield.

In addition, GM technology could offer solutions to key challenges, offering pest resistance and take-all resistance.

New BSPB role

What do you hope to achieve while being chairman at BSPB?
- I will actively champion breeding innovation and research links with the public sector and earlier this year, we launched the industry-led PVR initiative with DEFRA minister Lord de Mauley, which will see a new EU-registered PVR trademark.

The aim is to highlight the critical role of plant breeding innovation and quality seed in supporting a competitive farming industry.

I am also ambitious to raising the profile of commercial UK plant breeding at home, in the EU and internationally.

Many see royalties as a tax, how do you see BSPB changing these perceptions?
- I hope we have already done a lot to change such perceptions, with the development of the fair-play campaign, negotiations for the payment of farm-saved seed royalty and more recently the PVR initiative.

We are fortunate the society, the farmers unions and the seed trade have developed a good working relationship concerning the importance of collecting royalty for our intellectual property. In my opinion, cooperation with farmers has allowed us to develop the best system in Europe.

Without royalty funded plant breeding research there would be no new varieties for the UK farmer.

What concerns have you with publicly-funded research feeding into commercial breeding programmes?
- I have been delighted to see the increased emphasis placed on applied plant research over the past decade and I believe it has slowly become understood that the most successful delivery of plant genetic research will be via breeders producing varieties adapted to the needs of the UK grower.

That said, hedging mechanisms and funding between innovative research and delivery in field need to be developed further.

Royalty revenues, although essential to drive plant breeding programmes are relatively inelastic, with little finance spare to fund the translational research work needed to ensure new traits and methods can be successfully introduced into commercial programmes.

I believe this space needs to be filled by public/private partnerships and government investment.

For a company like RAGT, ideally suited to deliver new research innovations to the farmer, it will also be important that academic researchers and government clearly understand that if their research is to have the chance to reach the field, it needs to be freely available and without unrealistic demands for up-front payments.

That said, it is possible to see profit-sharing mechanisms when new research and technology has a commercial impact.

What are the main research projects you are working on?
- There are a large number of research initiatives that could have relevance to plant breeders. A very good example is Wheat Improvement Strategic Programme a Bio-technologies and Biological Science Research Council funded pre-breeding project aimed at the domestication of new traits into stable hexaploid wheat germplasm.

There are also individual research award available, the Crop Improvement Research Club and development projects funded via the Technology Strategy Board. All these initiatives are to be welcomed and I await with impatience the publication of the Agri-Products strategy document later this month (sponsored by DEFRA and the Department of Business and Skills).

If I have one continued concern, it is to ensure that all these initiatives are as “joined up” as possible, and truly lead to innovative research that breeders can use, not just a mechanism for funding “more of the same” public research. For that reason I think it is essential that the views of breeders and the constraints they face in running their programmes, are taken fully into account.

“Conclusion

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