

## THE BCPC ANNUAL WEED REVIEW 2015 – KEN PALLETT

The 52nd Weed Review took place at Rothamsted on 12th November 2015 with this year's theme being 'The true cost of weed control'.

Jason Tatnell (Chair of the BCPC Weed Review) introduced the Review by asking the following questions: what weed control was necessary and at what cost; could we sustain effective weed control and what does the future hold? These are in response to the challenges of weed resistance, (old and new threats); registration, (active ingredient (a.i.) development and rate sustainability); environment, (water framework directive, stewardship and a.i. loss); and agricultural policy (3-crop rule, farm economics and logistics).

Glyphosate is an essential component of many weed control strategies in the UK, in annual and perennial crops and in non-cropped areas and James Clarke (ADAS & Chair of WRAG) reviewed the risks of resistance to this herbicide in the UK. In spite of reports elsewhere, including on >50% of US farms, there are no known cases of resistance in the UK. However, the risks exist and procedures to minimise them were summarised in four key measures: to maximise efficiency (right dose at the right weed growth stage); to use alternatives (non-chemical and different modes of action); to monitor control levels; and to prevent survivors.

Lessons can be learnt from grass weed resistance i.e. the multiple resistance of blackgrass (*Alopecurus myosuroides*) and these can, and should be applied to reduce the threat of resistance development to glyphosate in arable crops. However, if resistance to glyphosate does emerge it is more likely to arise from its use in amenity or perennial crops where these key measures are more difficult or are not applied (*For further information see the AHDB Information Sheet 03 Summer 2015*).

The true costs of managing resistant blackgrass and changes in cropping due to the loss of meaningful post-emergence blackgrass control were presented by Jock Willmott (Strutt and Parker). These were linked to impact of the CAP reform and in particular the crop diversification or 3-crop rule. The costs for blackgrass control in winter wheat and oilseed rape had increased due to a switch to residual herbicides from the now less effective post-emergence herbicides which now suffer from multiple weed resistance. Whilst switching rotations from winter cropping of wheat and oilseed rape to spring barley and beans can reduce inputs, but it also reduces earning potential. These increases in weed control costs as well as the reductions in earning potential were in single-figure percentages; however they equated to the profitability margins of the farmers. A further issue of spring cropping is a reduced flexibility of weed control due to the choice of less effective control options and the impact of adverse winter and spring weather conditions. A further likely economic impact of the inability to control resistant blackgrass effectively is a reduced land value where infestations are heavy.

The current status of pesticides and the water framework directive in the UK was presented by Jon Gulson (Environment

Agency). The presence of these pesticides in either surface or ground water bodies has the potential to restrict their use e.g. timing and use rates. Currently 35 pesticides have environmental quality standards, the majority being herbicides. In the UK, only 12 of >3500 surface water bodies and 16 of the 271 ground water bodies, have been compromised by pesticides. The Voluntary Initiative (VI) has reduced the risk of pesticides in water in recent years, but challenges still exist in our knowledge of pathways into water bodies both surface and ground. Also increased farmer engagement is important to minimise risk.

The future issues and risks of broad-leaved weed (BLW) resistance in the UK were addressed by Lynn Tatnell (ADAS) and Mark Ballingall (SRUC). This has been the subject of much speculation, but there is a lack of real evidence. In 2014, there had been >50 cases of common chickweed (*Stellaria media*) resistance, >40 cases of common poppy (*Papaver rhoeas*) and 5 cases of scentless mayweed (*Tripleurospermum inodorum*) due to target site insensitivity to ALS inhibitors. It was uncertain if these were due to resistance or poor control. It was suspected that cases of BLW resistance may be greater than reported due to greater difficulty in assessing resistance in such species, compared to assessment of grass weed resistance. The overall conclusion is that in the UK incidences of BLW resistance are low and manageable as long as effective non-ALS herbicides, particularly those with residual activity, remain available for use.

Derek Gomes (Syngenta) reviewed the status of New Technology for Weed Control. The lack of new herbicides with novel modes of action, at least for the next 10 years, coupled to development costs, particularly for agriculture in Europe, highlighted the need for alternative weed control approaches. Furthermore, the regulatory situation for pesticides in Europe and the onset of resistance has led to the absence of effective weed control for some crops and has meant that the search for alternative strategies has become more attractive and a necessary option. These include, incorporating new technologies such as GPS, Real time kinematic (RTK), mapping and imaging approaches into weed-specific and directed herbicide applications. Some commercial machinery is available for mechanical weed control options in association with camera guidance. Non-chemical measures such as laser, heat and electricity treatment may have some potential although these may be limited due to high energy costs and safety as well as speed issues. The take up of such new approaches is associated with complexity and costs. Chemical weed control is both easy and cost effective however, continued loss of effective herbicide treatments through absence of actives, resistance and legislation will increase acceptance of new technologies. Future weed control will be an integrated weed management system using a combination of precise applications of traditional herbicides, in association with mechanical and other techniques, incorporation automation with targeted and robotic applications.

The final presentation from Jim Orson (ADAS TAG) addressed facing the future. The benefits of chemical weed control in the last 50 years were presented, but rather than coming to a complete end, there will be a transition towards integrated pest management (IPM), in which chemical weed control will play a part. However, trials to date have shown IPM leads to a 5% reduction in yields, although the absence of effective weed control would have a greater impact on crop yields. An important message was the need to retain knowledge and to use science particularly in weed biology, herbicide activity and behaviour in soil. It was concluded that for conventional agriculture to continue, biodiversity needs to be retained or increased. Resistance, herbicide availability and stewardship will shape UK agricultural systems. Herbicides will continue to be an essential component for weed control together with non-chemical methods and rotations. Reducing background levels of weed seed (low seedbank farming) and thinking longer term will be part of the selection weed management strategies.

In addition to the platform presentations, there were also 10 poster presentations covering some of the ongoing weed control research.

In the wrap-up to the Review, Jason Tatnell returned to costs and stated that herbicides have made weed control cheap and easy, but there will be no easy routes for effective weed control in the future. We need to look after and retain the herbicides that we have available today by effective stewardship and to avoid over-reliance on any one approach.

Thanks to an invitation from BCPC, my participation at the Review was a return to my weed control and herbicide roots after several years working in the deregulation of crop protection chemicals and GM crops in Germany and Belgium and I am left with a feeling of concern. Clearly, the days where a reliance on herbicides alone for weed control have passed. As with all areas of pest, disease and weed control, the answer has to be an integrated approach to reduce the impact of weeds on crop yield and quality. There is a need for research into such alternative options for weed control, but I question where this research is being done and who will conduct it. There is also a need for the chemical industry to find new actives and to find ways of keeping the current herbicides in the market place by avoiding resistance and by reducing any adverse environmental impact from their use. Although one could say that there is a role to play by regulatory bodies to accept that agriculture requires chemical weed control and not to regulate all the chemical options for this from the market place. The move from a risk-based, towards a hazard approach for the deregulation of crop protection chemicals has led to much of the loss of a.i.s available to the farmer. There is a risk in everything we do in life and the risk of agriculture not being able to deliver cost-effective food needs to be considered if we cannot control pest, diseases and weeds.

I hope that there is an acceptance of a need for future weed control research by all the stakeholders in both industry and the public sector who set agricultural research strategies and fund research programmes.

*Ken Pallett 20th November 2015*

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