

CROP PROTECTION IN NORTHERN BRITAIN 2002

Jeremy Snowden reports on a conference held every 3 years, which attracted over 250 delegates from as far afield as Latvia to Dundee in February 2002

As the Chairman, Bill Rennie, explained in his introductory remarks, against a backdrop of low commodity prices and low farm incomes, there was an increasing pressure to link farm practice, and in particular crop protection activities, to environmental protection. Integrated crop management systems would clearly be very important in the future.

Alistair Leake of the Allerton Research and Educational Trust then presented the keynote paper on 'Farming systems: subsidies and sustainability'. In it, he expanded this theme, and compared in detail the range of farming systems: intensive agriculture, integrated farming, through to the other extreme, organic farming. He suggested that, in future, there could be payments made to conventional farmers to encourage practices which benefit the environment.

The rest of the conference was split into 3 main sessions: Agriculture and the Environment, Combinable Crops, and Potatoes.

Agriculture and the environment

A paper on organic farming was presented by Audrey Litterick of the Scottish Agricultural College (SAC). In it, she detailed current strategies for the prevention and control of key pests and diseases. Clearly, though, research is urgently needed to deal with particular problems if UK organic agriculture is to expand to meet increasing consumer demand.

Dr Lindsay Easson of the Department of Agriculture and Rural Development, Belfast, described a 9 year study carried out in Northern Ireland. The results showed that yields and gross margins were consistently higher in mixed rotations compared with arable rotations at both full and half-rate levels of fertiliser and agrochemical input, although the differences were greater with reduced inputs.

With the rapid advances in information technologies, there were two papers – one on getting information across to farmers, and another on online training in crop protection (SAC).

Combinable crops

This session was begun by Melvyn Askew, Central Science Laboratory, York, who presented an interesting paper on new products and new opportunities for agricultural production. With the large surpluses of conventional crops, such as cereals, in Europe, there was scope for the development of non-food crops which could provide a wide range of oils, fibres, and carbohydrates.

Two papers were presented by SAC which described how the need for insecticides on cereals could be reduced. Firstly, Garth Foster reported on a study of risk assessment for BYDV (barley yellow dwarf virus) in autumn-sown cereals in the UK. The results showed that certain factors such as date of sowing, presence of permanent grassland, distance from the sea, and aspect, were all important in the levels of aphid infestations, and that forecasting could eliminate the need for routine spraying with insecticides. Charles Marriott described how, in choice test bioassays, neonate larvae of the wheat bulb fly chose couch seedlings and exudates over wheat seedlings and exudates, and showed geotaxis and negative phototaxis. This suggested that infochemicals isolated from couch, wheat and oats could be used in wheat bulb fly control. Andy Evans (also SAC) reported on the recent pest problems in Scottish oilseed rape crops. He described how the levels of both the brassica pod midge and cabbage stem flea beetle had increased although as yet they were not regarded as serious pests. He suggested reasons for their appearance and discussed whether they were likely to remain at present levels or even increase.

Rene Pollack of Dow AgroSciences explained how sow thistles, which have become a weed problem in oilseed rape crops, can be controlled effectively using clopyralid. Herbicide treatments are not always welcome as Gillian McLaren of the Scottish Agricultural Science Agency (SASA) explained. Glyphosate usage has increased recently as a pre harvest treatment on barley crops in Scotland, and this has resulted in the number of seed samples showing reduced field germination - which was confirmed in experimental tests. However, these effects are related to the levels of rainfall in the period immediately after spraying. Elaine Booth (SAC) reported on trials evaluating the effectiveness of genetically modified herbicide tolerant winter oilseed rape crops under minimal cultivation techniques. The results showed that crop establishment was improved by conventional methods, and that glufosinate ammonium treated plots tended to have greater weed populations and weed diversity than plots treated with metazachlor and cycloxydim.

A paper from the Department of Agriculture and Rural Development in Northern Ireland reported that trials over 8 years have shown that there is little commercial benefit in the application of fungicides to spring barley, but good returns on their application to winter wheat. Valerie Cockerell (SASA) explained that there was a need for further work in defining meaningful seed infection thresholds for net blotch, and the need to educate seed producers and

growers regarding the management of seed-borne disease in the production of healthy seed crops. Continuing with seed testing advances, Vince Mulholland (SASA) reported on the development of PCR assays for detection of *Microdochium nivale* and *Tilletia tritici*, which hold the promise of replacing conventional testing methods which are much slower. A paper from SAC provided up to date information on the increasingly important issue of necrotic spotting in barley crops. *Ramularia* has been identified on crops from various sites, although spots can also appear in the absence of pathogens. Strobilurin-based fungicides have proved most effective at controlling *Ramularia* and other spots in crops. Tijs Gilles of Horticulture Research International reported on studies of the spores of light leaf spot being transmitted from oilseed rape crops to Brussels sprouts. He explained that models are needed to predict the time to maturation of apothecia and to describe the conditions under which ascospores are released from mature apothecia.

Potatoes

The keynote paper was presented by Wilbert Flier of Plant Research International in the Netherlands. He described how late potato blight management has become more complicated following the introduction of 'new blight' in Europe. The pathogen has become more aggressive and, in response to this situation, an integrated approach is advocated, based on sophisticated decision support systems. Problems on controlling this disease in organic crops were highlighted in another paper. Protective copper fungicides, which are currently used, are to be revoked in the near future, and current controls including variety selection and breeding, within field diversification strategies, agronomic strategies, and alternative control treatments to copper fungicides were discussed.

The importance of potato volunteers was discussed by Ken Davies (SAC). He explained how they affected the quality of produce and acted as a "bridge" for pests and diseases, and that cultural, rotational and herbicide treatments should be used in their management. Trefor Woodford of the Scottish Crop Research Institute (SCRI) presented a paper on the management of aphid-transmitted viruses in Scottish seed potato crops. He explained how almost all seed potato crops are sprayed several times with pyrethroid and carbamate insecticides, imposing strong selection for insecticide resistance. Future control strategies to minimise the increase in resistance were discussed. John Wood (SASA) reported on a survey for *Ralstonia solanacearum* in Scottish rivers. This bacterial pathogen causes brown rot in potatoes, and contamination in a watercourse was reduced by herbicidal treatment of *Solanum dulcamara* (woody nightshade) whose roots were infected with this pathogen.

A computer program with predictive potential for the integrated management of the white potato cyst nematode designed by SCRI was described, and management of the problem requires the integration of rotation, nematicides and resistant varieties.

Paul Gans of NIAB, Cambridge, presented a paper on the evaluation of potato cultivar resistance to fungal diseases

causing tuber blemishes, such as skin spot and silver scurf. He explained that the aim of the study was to establish test procedures based on pot experiments, in which symptoms are artificially reproduced by introducing the inoculum at the beginning of the growing season in a manner resembling the natural disease cycle. A paper on tobacco rattle virus was presented by Finlay Dale (SCRI). He reported on RT-PCR methods for its detection in dormant potatoes, and a pre-plant soil test based on the capture of nematodes on paramagnetic beads; subsequent PCR for specific trichodorid species and associated virus was being devised.

Stuart Wale (SAC) described two experiments which examined the benefits of physical and chemical disinfection methods for grading lines to reduce disease risk. He concluded that regular cleaning of grading lines was recommended and should form part of a holistic approach to disease control.

Experimental tests by SCRI on the effect of soil inoculum level and environmental factors on the incidence and severity of powdery scab and rot galling showed that disease was more severe in soils kept at constant dampness, and that the effect of temperature was different from that on root galling. Another paper on powdery scab, presented by Stuart Wale (SAC), based on a GB-wide field trial and a five year study in England & Wales, confirmed that there is no simple or consistent relationship between powdery scab inoculum on seed and disease developing on the progeny crop.

New pesticides

Only two were reported in the conference: picoxystrobin, a strobilurin fungicide, discovered and developed by Syngenta AG for use on cereals, and cyazofamid, a novel cyanoimidazole protectant fungicide for the control of potato late blight, marketed in the UK as Ranman TwinPack by BASF.

Conclusion

Clearly, the future of crop protection lies in an integrated approach, and this was borne out by the paucity of new pesticides which have become very expensive to develop. Undoubtedly the conference demonstrated a wide range of strategies to aid farmers and growers, and all those involved in research and development must be congratulated on their efforts.

Future conferences in this series are planned to be held every two years, rather than every three, reflecting the fact that crop protection is changing more rapidly than at any time in the recent past. *Bound copies of the published proceedings are available from Tim Heilbronn at SCRI, email: T.Heilbronn@scri.sari.ac.uk*

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