

- New resistance ratings for recommended spring barleys
- Easier symptom ID and risk assessment

By Sarah Henly

■ This season saw the introduction of ramularia resistance scores to the spring barley HGCA Recommended List, helping growers manage risk from a disease that is growing in importance.

The new ratings were produced sooner than James Brown of the John Innes Centre had hoped for, thanks to the close collaboration of numerous industry partners in the LINK project, which he coordinates.

The project's aim is to develop an integrated approach to control, incorporating genetic resistance, risk forecasting and chemical intervention.

"Knowing more about the pathogen and the likely infection level can help growers plan their input programmes. But a key part is to find genes and markers to enable plant breeders to incorporate resistance into future varieties."

The project has pinpointed several different genes that together could offer reliable resistance, and this should ultimately bring higher ratings than on the latest Recommended List, the majority being 6s and 7s.

"Currently we have just one malting variety scoring 8 – Sanette. We will need to raise our game if climate change means wetter weather becomes the norm. A multi-pronged approach using robust resistance alongside chemical control measures will be essential," warns Prof Brown.

The risk forecast, developed by SRUC, is based on periods of leaf wetness around stem extension, which favours the movement of the fungus within plants. Spring barley is most at risk in the first two weeks of June, crops in Ireland and Scotland usually being worst hit.

Fortunately, though ramularia was occasionally damaging in the field last season, it was generally manage-



Better identification of the symptoms of ramularia is critical to its control.

Ammunition to control yield-robbing ramularia

able, says SRUC's Neil Havis.

"In Scotland it was unseasonably warm in March, which triggered spore release, putting crops at risk of infection around sowing time. We were concerned on finding symptoms before flowering across all spring varieties at one site, but this was due to excessive waterlogging and stress. Low summer light levels meant symptoms didn't develop in most situations."

Nevertheless, Dr Havis believes the normal pattern of a wet spring and warm summer can trigger ramularia, so a T2 fungicide with activity against ramularia – such as prothioconazole or an SDHI – is recommended.

In addition to studying fungicide efficacy, work at SRUC is evaluating fungicide resistance and the changes in the fungus that have contributed to its development.

"We know ramularia developed resistance to strobilurins at around the same time as Septoria tritici, to which ramularia is closely related. It is considered a high risk for developing resistance to the SDHI group of fungicides as well."

Other areas under investigation are the effectiveness of non-chemical treatment of seed stocks to prevent carryover of the disease, and the effect of overwintering spores

on straw, says Dr Havis.

While not part of the project, better identification of symptoms is critical to control, stresses Prof Brown. To this end, he has come up with a way to tell ramularia apart from net blotch and physiological leaf spotting.

"I look for the four Rs: rectangular, reddish, ring and right through the leaf. It's most likely to be ramularia if the edges of the lesions are straight and bounded by veins, their colour is reddish rather than blue-brown, there is a ring or halo of yellowing around the lesion and they can be seen on the upper and lower leaf blades," he says.

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SUMMARY

■ Project no. 3441: Control of ramularia leaf spot in a changing climate [Coracle]; John Innes Centre, James Hutton Institute, SRUC, with the participation of BASF, Bayer CropScience, KWS UK, LS Plant Breeding, Lantmannen SW, Limagrain, NIAB-TAG, Saaten Union, Sejet, Secobra, Syngenta Seeds and funding from BBSRC, HGCA and the Scottish government through the Sustainable Arable LINK programme; from May 2009 to May 2014. HGCA invested £200,000 of the total £910,000.

CROPS perspective

■ The inclusion of ramularia resistance ratings on the new spring barley Recommended List is just one outcome of this large project to minimise losses to the disease. Other angles are to refine forecasting and control seed-borne spread. The long-term prospect of developing varieties with even greater resistance is looking hopeful.

HGCA PERSPECTIVE

- Ramularia predicted to worsen with climate change
- Improving understanding of pathogen to fine-tune control programmes and develop seed treatments
- Identifying genes for new varieties
- Validating a risk forecast
- Interim report available on HGCA website www.hgca.com

