**Action:**

- Use the latest UK Recommended List to select varieties with high resistance ratings.
- Minimise disease carry over between consecutive crops by ploughing to bury trash.
- Use DMIs as the basis for most control programmes with fungicides from other groups as partners.
- Do not apply any one fungicide more than twice in a season or use it alone repeatedly on the same crop.
- Use all fungicides in mixtures or alternate them, choosing effective partners with a different mode of action to reduce the selection pressure for resistance.
- Apply no more than two strobilurin-containing sprays to any one crop.

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**Rhynchosporium control programmes**

**The disease**

Rhynchosporium, or barley leaf blotch (Rhynchosporium secalis), regularly occurs in wetter parts of the UK, particularly southwest and northern England as well as Scotland and Northern Ireland. It can develop explosively in early summer, causing serious yield losses on susceptible varieties.

Rhynchosporium can be carried on trash so continuous cropping should be avoided. Seed transmission is probably of minor importance.

Although there are varieties resistant to specific Rhynchosporium races, none currently grown in the UK is resistant to all races. Varieties with good field resistance should be grown in high-risk areas.

**Coping with fungicide resistance**

The risk of resistance is related to the pathogen and to the selection pressure imposed by the fungicide. Repeated applications of fungicides from the same group can lead to resistance, especially if barley is grown continuously. In general, selection pressure is minimised by alternating fungicide groups, or using mixtures.

Fungicide resistance to DMIs is increasing. Several older DMIs are now virtually ineffective and the performance of some newer ones is becoming compromised.

MBC resistance is common, particularly in Northern Ireland. MBCs are not suitable mixture partners in an anti-resistance strategy.

The risk of selecting resistant strains is considered moderate with strobilurins and anilinopyrimidines and low with phthalonitriles, dithiocarbamates, morpholines and spirotetramatines.

**DMI-based fungicide programmes**

Two-spray programmes were tested based on a DMI - epoxiconazole (Opus) alone and in combination or alternation with:

- fenpropimorph (Corbel) - a morpholine
- cyprodinil (Unix) - an anilinopyrimidine
- azoxystrobin (Amistar) - a strobilurin.

All four fungicides have different modes of action.

Trials were carried out in Northern Ireland and southwest England in 1998, 1999 and 2000.

Epoxiconazole, used alone, gave poorest disease control. Control was consistently improved when another fungicide was added.
Rhyncosporium control programmes

Cyprodinil was marginally the best partner (Figure 1).

Despite its relatively poor disease control, epoxiconazole gave a good yield response compared with untreated plots. However, all three partners increased yield further, azoxystrobin and cyprodinil being better than fenpropimorph.

Rhyncosporium was isolated from field trials before and after fungicide application and tested for DMI sensitivity. The least sensitive isolates were obtained from plots treated only with epoxiconazole. Applying a DMI with a partner fungicide reduces selection for resistance.

Other programmes

Ongoing work at SAC Edinburgh suggests that in some intensive production areas in Scotland where DMI resistance is high, programmes based on cyprodinil with a strobilurin or fenpropimorph may be the best option. However, a DMI may be required to control other diseases, particularly rusts.

Summary

HGCA-funded work led by Queen's University of Belfast has shown that fungicide programmes based on newer DMIs, in sequence or mixed with anilinopyrimidines or strobilurins, achieved the best disease control and yield. This approach reduces selection for resistant pathogen strains and preserves effective fungicide life.

Ongoing project work at SAC Edinburgh is investigating other programmes particularly suited to areas with high levels of DMI resistance, where anilinopyrimidines may have a more central role.

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Guidelines for preventing and managing fungicide resistance in cereal pathogens, HGCA/Frag-UK (2000)

Figure 1. Percentage Rhyncosporium on leaf 2 at ca. GS 70; mean of six field trials in England and Northern Ireland, 1998 - 2000

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