Background

New yellow rust races arise occasionally by mutation. They infect specific, hitherto resistant varieties and spread rapidly. Severe yellow rust can reduce yield by up to 7 tonnes/hectare. Accurate risk assessment and appropriate fungicide input are needed for robust, cost-effective control.

Is my crop at risk?

Yellow rust was widespread in 1997 and 1998. In mild winters, yellow rust survives from one season to the next on volunteers, set-aside and wheat crops. Long periods of frosts (below -5°C) reduce the risk of an early epidemic the following year.

HGCA’s ‘UK Recommended List of cereal varieties’ includes a 1-9 yellow rust resistance rating. Some very susceptible varieties (ratings 1 or 2, eg Brigadier) may be retained for a short period if they have outstanding yield or quality to compensate for their disease susceptibility.

In varieties with ratings of 6 to 8, disease patches (foci) can still form in spring but spread more slowly. Spray timing is less critical. Varieties with a rating of 9 are not susceptible to current races but should be monitored for new races.

Crops grown from Baytan-treated seed are less likely to develop yellow rust early in the season. Triticonazole and fluquinconazole seed treatments, likely to be available in the UK in the future, also give early control of yellow rust.

Yellow rust epidemics develop rapidly on large, leafy crops given excessive nitrogen. Managing nitrogen inputs, and hence canopy size, will help avoid severe epidemics and will not penalise yield.

Fungicide choice and dose

A recent HGCA-funded project aimed to determine the ‘appropriate’ fungicide dose for effective yellow rust control. Effects of triazole and morpholine fungicides at different doses (quarter, half, three-quarters and recommended dose) were tested (Figure 1 overleaf). Disease pressure was high in the experiments.

Epoxiconazole and tebuconazole suppressed disease to low levels with quarter dose treatments. A half dose was required to completely control disease. Cyproconazole was slightly less effective. Higher doses of flutriafol, flusilazole and propiconazole were required. Yield and specific weight were improved by the best treatments and leaves remained green for longer.

Morpholine fungicides (eg fenpropimorph, fenpropidin) provided useful control. They have...
short persistence and should be used in combination with triazoles.

Strobilurins, particularly azoxystrobin, have good protectant activity against yellow rust. They should be used in formulated or tank mixture with a good triazole.

**Spray timing**

Most yellow rust control failures result from poor spray timing or too long an interval between sprays. An epidemic may build up if the first spray is applied late. If applied too early, further applications are required to ensure continued coverage of newly emerging leaves.

Crop walking provides the best guide to timing the first spray. The risk factors discussed earlier help identify crops that need most frequent monitoring and greatest fungicide input.

If active crop growth has started in spring and yellow rust foci form or start to spread, spray immediately. If the first treatment is applied at or before first node (GS 31) and disease pressure continues, further treatments may be needed at second to third node GS 32/33 and when the flag leaf is fully emerged (GS 39). If the first spray is delayed until GS 32/33 and the epidemic does not become established, a second spray at GS 39 should be effective.

Provided the crop has been well protected as the final three leaves emerge, sprays applied after GS 59 are not worthwhile.

**Fungicide resistance**

HGCA-funded projects have monitored sensitivity of yellow rust to triazole fungicides. They were all fully effective in 1990. By 1998 there had been a clear shift towards resistance. Fungicides remain effective in the field but in future higher doses may be required.

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Crop walking provides the best guide to timing the first spray. The risk factors help identify crops that need most frequent monitoring and greatest fungicide input.

Effective active ingredients applied as protectants (before disease was established) also performed well as eradicants (after disease was established). The best control was achieved with sprays applied as protectants.