Strobilurin resistance in *Septoria tritici* in the UK

**Septoria control in 2002**

In general, field performance of fungicide programmes against *Septoria tritici* in the UK was good despite high disease pressure. However, control varied around the UK with high *S. tritici* levels in the south-west, south-east, west midlands, Scotland and Wales.

In a few areas, notably south-west Ireland, disease pressure was extreme and control poor. At some sites poor timing and very low fungicide doses may have been the cause of poor control. However, at some sites resistant isolates of *S. tritici* have been implicated as one of the reasons for the poor control.

**Resistance discovered**

During 2002, *Septoria tritici* isolates carrying the strobilurin resistance gene (G143A) were found in the UK and the Republic of Ireland.

In other European monitoring programmes carried out during 2002 the vast majority of *S. tritici* isolates tested were not resistant to strobilurin fungicides.

Some isolates from 2001 were also tested and a low frequency of resistant isolates was found. Thus, the resistance gene has been present in *S. tritici* populations for at least two years. During this time very few problems of disease control were reported.

**2003 monitoring**

Samples of *S. tritici* from winter wheat crops from around the UK were tested in March 2003. The G143A resistance gene was found in most of the samples tested.

Of the samples tested to date, the range of resistance gene frequencies was between 0% and 70%. On average, 40% of the isolates were found to be carrying the resistance gene.

The interpretation of these results, in terms of how this will affect field performance of fungicides, is debatable. However, the results clearly show an increase in frequency from previous years and emphasise the need to follow the guidelines described here. In crops where the gene frequency is high, field performance of the strobilurins, and thus disease control, may be affected.

If you are unsure about any of the suggested actions, or want them interpreted for your local conditions, consult a professional agronomist.
Summary

Isolates of *S. tritici* carrying the strobilurin resistance gene G143A are now common in the UK. The practical implications of this remain to be assessed.

The presence of resistance may affect the performance of strobilurin fungicides against *S. tritici*.

Strategies are required that will maintain both disease control and yield as well as minimising the risk of resistance reaching levels where field performance is impaired.

This Topic Sheet, based on a project sponsored by Defra through the Sustainable Arable LINK Programme with HGCA co-funding, provides some guidance for farmers.

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Strategic planning

Fungicide programmes should be designed to ensure good disease control as well as protecting the activity of the strobilurins for the future (Table 1). The following principles should help to achieve both objectives.

**Mixtures**

Fungicide mixtures are the key to both reliable disease control and yield protection. Mixtures should include partner doses that will give effective control of Septoria. They also broaden the disease control spectrum, maximise green leaf retention and insure against resistance in the target pathogens.

**Exposure time**

The longer pathogen populations are exposed to a fungicide the more likely resistance will develop. Restricting use to two strobilurin foliar applications in a season will help reduce resistance development.

**Dose**

Using high doses (particularly of fungicide mixtures) gives more robust disease control, protects against yield loss due to disease and may help to prevent further resistance development. Keeping disease levels low is likely to restrict development and spread of resistant populations.

**Timing**

Timing of the two strobilurin sprays should be based on disease pressure and local knowledge. However, strobilurins should be used preventatively whenever possible to avoid treating leaves which are showing obvious symptoms.

**Yield effects**

The main effect of strobilurin fungicides on yield is through disease control. However, there is evidence for additional yield benefits associated with delayed senescence and prolonged grain filling, together with good crop safety. However, these effects will not compensate for poor disease control resulting from poor timing or incorrect dose.

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Table 1. Current strobilurin (QoI) fungicides on wheat

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Example products containing active ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin</td>
<td>Amistar, Amistar Pro</td>
</tr>
<tr>
<td>Famoxadone</td>
<td>Charisma, Medley</td>
</tr>
<tr>
<td>Kresoxim-methyl</td>
<td>Landmark, Ensign</td>
</tr>
<tr>
<td>Picoxyystrobin</td>
<td>Acanto</td>
</tr>
<tr>
<td>Pyraclostrobin</td>
<td>Comet, Tucana, Opera, Opponent, Vivid</td>
</tr>
<tr>
<td>Trifloxystrobin</td>
<td>Twist, Swift</td>
</tr>
</tbody>
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