Fungicides for light leaf spot control in winter oilseed rape

Summary of HGCA fungicide project 2010–2014 (RD-2007-3457)

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HGCA is the cereals and oilseeds division of the Agriculture and Horticulture Development Board.
Background

Fungicides for control of light leaf spot have been evaluated over the last five years at ADAS High Mowthorpe, North Yorkshire and by SRUC near Edinburgh or in Aberdeenshire on susceptible varieties. Fungicides have been tested predominately at half and full label dose (¼, ½, ¾ and full dose in 2012/2013), applied in autumn (ideally November) with a second application pre or early stem extension (February/March). Leaf disease assessments were done after each application and pre-harvest. Combine harvested yield data are adjusted to 91% dry matter.

Results

The results obtained from the 2011, 2012 and 2014 harvest years in North Yorkshire showed moderate disease development in trials (c. 9–10% leaf area affected in untreated plots). These can be compared with sites with lower disease severity in 2013. In the 2013 harvest year, crops at experimental sites suffered considerable loss of leaf during the winter and the light leaf spot severity was low (<5% leaf area affected). In 2014 in Scotland, c. 9% leaf area was affected in untreated plots in mid-May and, in North Yorkshire, c. 9% leaf area was affected in untreated plots in early April.

2011

The light leaf spot site at Malton, North Yorkshire (cv. Castille) was sprayed on 16th November and 14th March. There was significant control of light leaf spot with all treatments 8 weeks after the spring spray (Figure 1). A mixture of prothioconazole + tebuconazole (as Prosaro) gave the best control. Prosaro at full dose gave better disease control than all the other treatments and was the most effective product at half dose. The mean yield response to fungicides (0.57 t/ha) was significant. Individual treatments gave responses of up to 0.8 t/ha (untreated yield 4.40 t/ha). Disease control was marginally better at full dose, although there was very little difference between half and full dose treatments for yield.
2012

The light leaf spot site at Malton, North Yorkshire (cv. PR46W21) was sprayed on 21st November and 13th March. There was significant control of light leaf spot with all treatments (Figure 2) but little to choose between products or half and full dose in terms of efficacy. There was a significant yield response to treatments of between 0.35 t/ha and 0.73 t/ha but no significant difference between full and half dose.
Figure 2. Light leaf spot control (bars) and yield (points) at Malton, North Yorkshire 2012. Disease control and yield responses were all significant. (Note: Sanction was withdrawn from sale in 2013; authorisation for the disposal, storage and use of existing stocks by any persons ends 12th October 2014)

2013

Fungicides were applied on 18th December and 30th April to cv PR46W21 at Malton, North Yorkshire and on 17th December and 26th May to cv. Castille near Edinburgh. Crop growth in spring was delayed by cold weather and treatment timings were later than in previous years.

There were significant yield responses at both the Edinburgh site and the Malton site. Proline at full dose gave the highest yield (3.93 t/ha) at Edinburgh, a response of 1.41 t/ha over the untreated. This was a particularly large response for a crop with quite low levels of light leaf spot. There were positive yield trends at Malton, where the yield of full dose Proline was 3.57 t/ha (untreated yield 3.10 t/ha). Sanction did not give significant yield responses and only gave light leaf spot control at the Malton site. The other treatments also gave yield responses, though most were not statistically significant (Figure 3).
Figure 3. Light leaf spot control (bars) and yield (points) in relation to fungicide dose, a. Malton, North Yorkshire 2013 and b. Edinburgh 2013. Pale bars and points are not significantly different from the untreated. (Note: Sanction was withdrawn from sale in 2013; authorisation for the disposal, storage and use of existing stocks by any persons ends 12th October 2014)
Fungicides were applied on 27th November and 19th February to cv PR46W21 at Malton, North Yorkshire and on 27th November and 28th February to cv. Castille near Edinburgh. Light leaf spot was observed early in the new year at the site in North Yorkshire and fungicides were applied slightly earlier than stem extension at this site.

There were significant yield responses at both the Edinburgh site and the Malton site. Orius P at full dose gave the highest yield (4.34 t/ha) at Malton, a response of 0.57 t/ha over the untreated. There were positive yield trends at Edinburgh, where the yield of full dose Proline was 4.21 t/ha (untreated yield 3.72 t/ha). The other treatments also gave yield responses, though most were not statistically significant (Figure 4). Negative effects on yield can be observed where fungicides with PGR activity have been applied to small crops in the autumn.
Figure 4. Light leaf spot control (bars) and yield (points) in relation to fungicide dose, a. Malton, North Yorkshire 2014 and b. Edinburgh 2014. Pale bars and points are not significantly different from the untreated.
Dose-response curves

The dose-response curves for light leaf spot control averaged across the four experiments in 2013 and 2014 showed strong dose response for all products with small disease control benefits from increasing dose above half dose (Figure 5). This builds on data collected from the Edinburgh and Malton trials in 2013. Yields in the trials in 2013 and 2014 are likely to have been affected by PGR activity on small plants and this should be considered when interpreting yield effects.
b.  
**Figure 5.** Light leaf spot control (a.) and yield response (b.) in relation to fungicide dose, 2013/2014 (mean of 4 experiments).

**Comments**

Light leaf spot incidence has been very high in England for the last seven years. The new light leaf spot forecast for 2014 will be published in October ([http://www.rothamsted.ac.uk/light-leaf-spot-forecast](http://www.rothamsted.ac.uk/light-leaf-spot-forecast)) and, although pod infection was low in many areas this year, light leaf spot was well established on stems. There is still likely to be a general epidemic as air-borne spores are produced on infected stems as well as on other plant parts.

These recent fungicide experiments indicate that good control of light leaf spot is difficult to achieve. The leading fungicides are triazoles and some sites have shown benefits from using application rates above half dose but some have not. (Note that treatments have not been tested under very high disease pressure.)

There are prospects for improving control by better fungicide timing, as many crops are treated when the disease is already well established. Early detection and treatment in January/February will provide more effective control than treating heavily diseased crops at the stem extension stage.
Key points

Strategic

- Consult the light leaf spot forecast (www.rothamsted.ac.uk/light-leaf-spot-forecast) but assess light leaf spot management and control on a farm by farm basis. If light leaf spot was well established on stems before harvest, there is a high risk of continuing problems in 2015, as air-borne spores are produced on the previous year’s crop debris. Note that late emerging crops may be less severely affected than earlier sowings.

- Use resistant varieties (HGCA Recommended List resistance rating of at least 7) if light leaf spot is well established in crops on the farm.

Crop decisions

- Use a spray in autumn (November) at high-risk sites. After the autumn treatment, inspect crops regularly on a field by field basis for light leaf spot from January onwards. If phoma sprays are being used, check crops in winter and early spring to determine if phoma sprays have given adequate control of light leaf spot.

- Treatment timing is important: be prepared to apply fungicide as soon as light leaf spot is found (weather conditions permitting). This could be prior to stem extension. The old spring threshold for light leaf spot control of 25% of plants affected applies only at the early stem extension stage. At current prices, a threshold of 15% of plants affected may be used at early stem extension as this equates to a 5% yield loss (or 0.20 t/ha (£50/ha) in a 4 t/ha crop). Prior to stem extension, there is no threshold, so react to the presence of light leaf spot by spraying as soon as it is seen.

- Within the HGCA fungicide performance project there have been some differences between products and control is likely to be improved by increasing the number of applications rather than by increasing dose.

- Yield increases in response to product dose were variable between sites and years. Dose selection is very site- and situation-specific and will depend on varietal rating, crop growth and disease pressure. For increased efficacy at high disease pressure sites, higher doses may be necessary but this did not always translate into yield responses in the trial series.

- Depending on other factors, product choice will be influenced by requirements for phoma activity and/or plant growth regulation of large plants (e.g. metconazole or tebuconazole products). Some negative responses were noted at sites where fungicides with PGR products were used at high doses in stressed crops.