

Spot the difference

“ *L. biglobosa* can dominate where an *L. maculans* resistant variety is used. ”

Technical OSR disease control

Phoma may have assumed a lesser importance lately but the disease hasn't gone away. *CPM* discovers more about the phoma pathogens, particularly *Leptosphaeria biglobosa* where plant resistance isn't a factor.

By Lucy de la Pasture

Over the past few seasons, light leaf spot (LLS) has usurped phoma stem canker as the number one disease of oilseed rape in the UK. The change is partially due to the introduction of improved resistance genes against the phoma pathogen in an increasing number of OSR varieties, as well as weather conditions that have been very favourable for LLS epidemics.

In spite of being relegated to second spot, the potential for phoma to cause devastating yield loss remains and it's important not to take the eye off the ball

where the disease is concerned, believes Dr Bruce Fitt, professor of plant pathology at University of Herts.

“Phoma stem canker is caused by two pathogens *Leptosphaeria maculans* and *L. biglobosa*. *L. maculans* is generally considered to be the more damaging of the two, causing stem-based cankers and *L. biglobosa* less so, because it tends to cause stem lesions higher up in the canopy,” he notes.

Complete life cycle

Phoma stem canker goes through one complete life cycle each cropping season and epidemics are initiated in the autumn by the release of airborne ascospores from crop debris.

“The timing of spore release is influenced by the weather conditions and if it's wet in the period beginning 1 Aug, it tends to bring forward the release of ascospores. In a dry summer/autumn season, ascospore release will be delayed.”

Rothamsted Research produce a phoma forecast based on weather data to help predict likely timing of phoma leaf-spotting and improve consequent

spray timing. The established threshold for fungicide treatment is when 10% of plants within a crop are affected by phoma leaf-spotting. Control using fungicides needs to be timely because it's only



Bruce Fitt explains *L. biglobosa* tends to infect later in the season, causing stem canker higher up the stem.

Phoma disease cycle

The disease cycle is similar for both pathogens, which survive over summer on crop debris, particularly the taproot and stem bases of OSR stubble, which become encrusted with black fruiting bodies.

Most fruiting bodies are initially the asexual structures that release rain-splash dispersed spores (conidia) but by late summer and into the autumn, the sexual stage occurs as small black spheres around 0.5mm in diameter.

These mature to release wind-dispersed spores (ascospores) after rain or wetting by dew. The ascospores can blow long distances but most are deposited within 300m of the source. Ascospores deposited on leaves of new crops germinate in



Phoma pathogens are hard to distinguish between visually.

moist conditions and infect leaves via stomata and wounds, leading to small pale lesions (phoma leaf spot) that appear 7-15 days after infection depending on temperature.

The pale lesions develop black specks, which are additional asexual fruiting bodies that release splash-dispersed spores. Lesions of *L. biglobosa* are usually smaller and darker in appearance but both types vary according to interactions with the cultivar and recent weather.

From phoma leaf spot lesions, the fungus grows symptomlessly through the leaf to the stem, where it incubates until early spring when rapid growth by the fungus produces a visible stem rot or canker. Severe cankers cause early senescence and lodging but in UK conditions, cankers do not reduce yield unless they expand to girdle at least half the stem by late May.

Source: Cropprotect, Rothamsted Research

possible during the early stages of phoma stem-canker epidemics, he adds.

“Once an OSR crop is infected, the phoma pathogen causes leaf spotting and eventually grows along the leaf petiole into the plant stem. Once within the plant stem, the fungi are beyond the reach of fungicides and they invade and kill stem cell tissues, resulting in the formation of phoma stem cankers,” explains Bruce. ▶

Wet Aug increases phoma risk

A wet Aug has prompted an early warning for phoma to OSR growers, with some areas having half the average monthly rainfall in the first 10 days of the month. Twelve days with rain were recorded in Aug at ADAS sites in Cambs and Herefords, notes Faye Ritchie, ADAS plant pathologist.

“It all depends on what happens from here, but it’s been a wet start and spores require roughly 20 days with rain to mature. If it remains unsettled then we could expect to see leaf spotting in late Sept. Monitoring crops to determine when thresholds are met (10-20% plants affected) will be what matters most.”

Many crops have benefitted from the rain and got out of the ground within five days of being drilled, and good growth could limit the disease spreading from leaves to petiole and then stems.

Bayer’s Jack Hill says that although many varieties having the Rlm7 resistance gene, it won’t necessarily negate treatment. “A good phoma rating will help delay the threshold being reached, but may not mean treatment is avoidable in resistant varieties.”

Costello
WINTER WHEAT

Number 1 for grain quality

Chosen for its outstanding grain quality, Group 4 variety Costello also brings excellent yields, the highest specific weight on the RL, superb disease resistance and stiff straw. It will reduce your risk and enhance your profit.

senova

Tel 01223 890777 • Email info@senova.uk.com • [@SenovaLtd](https://twitter.com/SenovaLtd)
www.senova.uk.com



Many current varieties have major resistance gene Rlm7, which operates against infection at the leaf-spotting stage of the disease by the pathogen *L. maculans*.

► The relative importance of *L. maculans* and *L. biglobosa* pathogens may vary between sites in the UK, but the focus from both plant breeders and fungicide manufacturers has been firmly on the former pathogen, with *L. biglobosa* assuming lesser importance.

“Many current varieties have major resistance gene Rlm7, which operates against infection at the leaf-spotting stage of the disease by the pathogen *L. maculans*. This is usually in combination with a quantitative resistance, based on multiple minor genes, which slow down the spread of the pathogen along the petioles and into the stems of OSR plants, as well as protecting the major resistance gene.

Severe lesions

In field experiments carried out in the UK, researchers have shown amounts of *L. biglobosa* DNA were greater than those of *L. maculans* DNA, in both upper stem and stem-base samples. These results suggest that the severe upper stem lesions and stem-base cankers in the 2011/2012 cropping season were mainly caused by *L. biglobosa*, indicating that the pathogen can sometimes cause considerable yield

losses, points out Bruce.

The researchers also noted differences between OSR cultivars in the incidence of *L. maculans* and *L. biglobosa*, suggesting that host resistance affects the population dynamics of the two different phoma pathogens. The amount of *L. maculans* DNA was less

than *L. biglobosa* DNA in cultivars with the Rlm7 gene, but the other way around in susceptible varieties without resistance genes against *L. maculans*. “This suggests that *L. biglobosa* can dominate where an *L. maculans* resistant variety is used,” he explains.

Another piece of published

Saving prothioconazole for light leaf spot control



Luke Cotton is planning on saving prothioconazole for later disease control.

Independent agronomist and AICC member Luke Cotton agrees with him. “Multiple applications in the autumn and spring of prothioconazole for phoma and LLS, especially on susceptible OSR varieties, has proved to be an expensive way of treating crops,” he says.

With both diseases regularly threatening the 1300ha of OSR across his farms, Luke believes that switching to an autumn application of Refinzar has benefitted his growers through the introduction of two new active ingredients.

Persistent control of both infections, combined with less overall fungicide applications, have meant a significant saving in both input and fixed costs, whilst taking the pressure off prothioconazole and allowing it to be saved for the spring.

“We were applying prothioconazole up to three times across the autumn and spring, and often disease control was compromised in a bad year. Although in susceptible varieties, early threshold recognition allowed us to keep on top of things, reinfection meant that repeated applications were often necessary.”

Saving prothioconazole for use later in the season is a tactic Jon is also employing. “In terms of efficacy, the Refinzar matches prothioconazole, so provides a robust and reliable platform for autumn disease control. This means we can preserve the prothioconazole almost exclusively for spring/summer use,” he explains.

“It’s now become a genuine treatment option for us with the high output varieties we’re now growing, such as Elgar, Flamingo and Nikita. And although we apply according to observed disease thresholds, it’s a really good fit for that type of

In the field, where there’s a likely mixed population of pathogens, what approaches are agronomists taking to phoma control this autumn?

NIAB-TAG agronomist Jon Bellamy is advising growers with over 2800ha of OSR in Northants, Oxon and Bucks, and is acutely aware of the need to spread the fungicide workload with different active ingredients.

Having lost some actives from the market over the past few years, there were few options for effective autumn disease control. The introduction of some new products, including Refinzar (penthiopyrad+ picoxystrobin), has not only filled the gap but also taken disease management to a new level. Most importantly it means he’s not reliant on just one product alone.

With an increase in the incidence of LLS and multiple sprays commonly being applied, the overuse of Proline (prothioconazole) could lead to selection for fungicide insensitivity and a reduction in triazole efficacy, he points out.

GRAZERS
EFFECTIVE AGAINST DAMAGE FROM
RABBITS PIGEONS DEER GESE

from £5/acre (£12.50/ha)

- ✓ Spray from 1st leaf stage on crops at risk
- ✓ Spot treatments and headland sprays most cost effective
- ✓ Safe to use on edible crops - spray modules twice before planting
- ✓ Used on cereals, OSR, game cover, grass, horticultural crops

AVAILABLE FROM MAJOR AG.CHEM SUPPLIERS

For more info: www.grazers.co.uk
info@grazers.co.uk tel: 01768 800 555 fax: 0845 8622123
 @grazersfamily facebook.com/GrazersFamily

L. maculans causes basal stem cankers which can lead to lodging of the crop.



research seems to indicate that *L. biglobosa* is less sensitive to some triazole fungicides than *L. maculans*, but it's a subject under much debate, stresses Bruce. ■

variety's disease strengths and weaknesses."

Luke believes that using the combination of non-triazole actives has given more disease security, especially when used in conjunction with the more resistant varieties.

"It's given us an ideal way of reducing the total number of fungicide applications while delivering other physiological benefits. If we're mainly targeting phoma, it also takes care of any latent LLS infection.

"The SDHI element provides both sound protectant and curative activity on phoma leaf spotting and the subsequent reduction in stem canker. The strobilurin part also delivers longer-term protection and their combined physiological benefits can often result in greater root density and rooting depth."

Jon regards any physiological benefits as an added bonus. "It's difficult to try to quantify how much yield benefit is generated through enhanced growth and root establishment. But with levels of clubroot on the increase and potential damage from cabbage stem flea beetle, a stronger, healthier and more vigorous plant has got to be more resilient to infection or attack."

He suggests that improved rooting could be a strategic option on lighter and more drought-prone soils, where enhanced root biomass is essential to prolong the life of the crop and reduce the likelihood of early senescence.

"Fungicide choice still comes down to getting effective control of both major diseases and a single treatment of between 0.5 l/ha and 0.75 l/ha should, depending on the

variety, carry the crop through to the spring."

Agrovista agronomist, Robert Wilkin believes fungicide application at the first signs of phoma leaf-spot infection and particularly when weather conditions are variable, can also mean significant control of LLS even though the symptoms may not be visible.

"My growers in N Yorks recognise the need to control infections of both phoma and LLS before weather conditions dictate otherwise," he explains.

"We incubate leaves to ascertain latent LLS infection levels and like to apply product early enough to ensure good control. Fungicides are best used in a protective scenario and I often apply them in tandem with a boron supplement. If fungicides are left until inclusion with Kerb (propyzamide), it can be too late and put too much pressure on the fungicide."

Jon Bellamy says the physiological effects on the crop from applying an SDHI plus strobilurin fungicide is a useful added benefit.



Your Farm
Your data
Your Knowledge

Map your costs
Improve your profit



Translating Data into Knowledge

- Omnia is a user-friendly agronomy software tool that turns your farm data into agronomy knowledge.
- Generates maps for a range of field characteristics which are analysed to produce variable seed rate plans.
- Simple to use and compatible with most machines, it is a cost effective, proven and flexible agronomy tool.

For more information visit
omniaprecision.co.uk

HUTCHINSONS
Crop Production Specialists

(Omnia Service Centre 25 Sheepfold Rd, Darrington, Lincoln LN4 3PZ)