OSR disease

A gradual migration

Traditionally, phoma stem canker has been deemed a southern oilseed rape disease and light leaf spot a northern one, but evidence suggests these diseases are migrating. *CPM* digs deeper to find out what's happening.

By Melanie Jenkins

One thing about disease is that it's always changing and adapting to outplay its adversaries, namely farmers, agronomists, breeders and crop protection manufacturers. But the impacts of climate change and shifting growing habits are helping two of the key oilseed rape diseases, phoma and light leaf spot, to migrate geographically.

Light leaf spot, has without doubt, spread much further south than was historically seen, observes LSPB's Chris Guest. "From screenings, we've seen it reach the Humber, and then the Wash and is now more than likely lower than this."

The migration of disease is an unfortunate result of climate change, and this year has provided conducive conditions for it because of the wet March, says Chris. "The disease was previously more prevalent in northern regions where the weather is generally cooler and wetter, which helps it to cycle, but now we're seeing these conditions in southern areas of England, meaning the disease has spread. We're even seeing it impact northern continental Europe and it's reaching further south into Germany."

Phoma

On the flip side, historically, phoma has been the polar opposite of light leaf spot, being a predominantly southern disease. But anecdotal evidence suggests it's slowly spreading further north, says Chris. "It's certainly something to be aware of and is likely more of a challenge further north than many consider it to be."

According to Prof Fiona Burnett of SRUC, phoma is becoming more common in Scotland but it tends to come into plants so late in the season that it's not reaching its dangerous phases. Maybe surprisingly, she's been aware of phoma in Scottish OSR crops for the past 15 years, from as far north as Perth and Fife. "Nearly every season someone will come into a crop clinic and bring up the disease, but it's never occurred at levels that are anything more than 'interesting', or levels that you'd have to worry about.

"Warmer temperatures between July and September are creating suitable conditions for the disease and because OSR is such a prevalent oil and break crop in Scotland, it's fuelling the conditions for disease."

> *"We know fungicides aren't invincible."*

Bayer's Grant Reid concurs. "Through Bayer's CropCheck project, I've seen a gradual increase in the amount of phoma picked up in Scotland. However, we're not

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seeing it at great levels with the instance of infection from the submitted samples in the high teens up to about 20%. It's certainly very early days with the disease and we're not at the stage where we'd brief our agronomists on it."

Fiona feels that variety selection could potentially have opened the door for phoma to spread among Scottish OSR crops. "Historically, growers have selected varieties based on their light leaf spot resistance and their yield, so there's a possibility that a lot of crops have had weaker phoma resistance because it hasn't been a priority."

So unlike light leaf spot, phoma hasn't reached levels where it's likely to be a concern to Scottish growers, says Fiona. "Because the disease isn't occurring in early autumn, it doesn't require treating separately to light leaf spot. Further south, it would be treated with an earlier spray to keep levels low going into October, but Scotland isn't seeing any appearance of phoma that early."

The change in drilling to a far earlier window is also having an impact of disease in crops, notes Chris. "Going back ten years, most people wouldn't start drilling until 14-20 August, but now we're seeing OSR planted much earlier. It's a very useful tactic to allow the plants to build a bigger canopy and grow away from cabbage stem flea beetle, but when crops are in the ground several weeks to a month earlier, this is a lot of extra time to have disease in the plants. It's essentially the inverse of what we see happening with winter wheat and blackgrass."

Pathogen sporulation

"OSR crops being in the ground this much longer is probably producing the biggest change in disease pressure that we see. And this extends to clubroot because earlier sowing into warmer conditions allows for more sporulation of the pathogen," explains Chris. "The change in sowing dates is definitely a reason for why we've seen a slight change in the behaviours of these diseases and how impactful they are."

According to Prof Fiona Burnett, phoma is becoming more common in Scotland.

Fiona agrees: "It's very unpopular to suggest delaying drilling, but the earlier you drill, the more predisposed to disease your crop will be. Because light leaf spot is carried on the seed, it can help to buy it certified or from good provenance." ▸

Variety viewpoint

Agrii, which conducts its own variety trials across the country, now treats the UK as one when it comes to light leaf spot resistance scoring, explains the firm's David Leaper. "In Scotland, this disease is generally prevalent every year, but we're now seeing a lot more of it in the south too.

"Our trials extend from Kent up to Scotland and although we lost the Kent site this year, light leaf spot was present at every other site at an assessable level."

Something David has observed is a noticeable contrast in the firm's trial results in the North compared with the East and West regions. "What we're seeing is suggestive of different strains of light leaf spot further north than what's infecting crops in other areas."

For official trials, NIAB will inoculate plants in a nursery with representative strains of disease to produce a resistance rating, explains David. "Although this provides a good indication of resistance, it can differ from what's going on in the field. So through our trials we assess what we see occurring in the field including late season disease infection on the stems.

"A good example was Elgar which had a strong rating (7 on 2021/22 RL) for light leaf spot, but was very susceptible later in the season."

Another variety David advises keeping an eye on is Aurelia. "It's been the market leader and has always had a good light leaf spot rating (7 on 22/23 RL) but at several of our sites, the assessment in July identified late season disease present at a greater level than the official rating would suggest.

"So what we're seeing is that the rating is a good indication of performance but with some varieties they're becoming susceptible later in the season. So just be mindful that the ratings are a guide and not a definitive," he advises.

Looking a phoma, David sees a lot of phoma leaf spotting each year, but this doesn't necessarily turn into canker development. "From an agronomist's point of view, phoma is definitely seen as the less problematic disease, but we're hearing reports of the disease in Scotland now and it was never considered much of a problem there."

However, triazole chemistry applied in the autumn provides good control of the disease, he says. "And a lot of breeders are talking about new sources of genetic resistance to it, such as *RlmS*. Although there's some breakdown of resistance on the continent, such as with Rlm7, phoma is still less of a problem and most varieties coming to the market now have reasonably good resistance."

And over the past two years, several breeders have introduced new varieties with good late season stem health, which includes resistance to verticillium stem stripe, says David. "Vegas, Murray, Turing and now candidate variety, RGT Kanzzas, have brought a whole new level of resistance to the table and in our trials, we're seeing these varieties deliver as we'd expect them to.

David Leaper advises being mindful that varietal disease resistance ratings are a guide and not a definitive.

"I've worked with varieties for 25 years and it's really only in the last five that I've seen huge advances in the robustness, standing ability and disease resistance come through — it's a real success story for breeders, but unfortunately OSR has hit the buffers with challenges from insect pests.

"However, it means growers can select varieties from the RL with more confidence than ever before. And there's such a lot of varieties with good levels of disease resistance, why would you choose to grow one that's lower?"

Severe phoma stem canker infections in high-risk areas this year have resulted in lodging and yield reduction in certain varieties, compared with LSPB's Murray.

▸ She feels that rotation can be a harder aspect to change but acknowledges that most growers have moved from a one-in-three to a one-in-five situation.

Because light leaf spot has become a UK-wide issue, Chris feels this is influencing variety choice across the nation. "Looking at varietal disease resistance scores in relation to treated and untreated yields, the correlation is obvious, so selecting a resistant variety is a no brainer whether you're in Cambridgeshire or County Durham."

The progressive spread of light leaf spot further south is a key part of how LSPB's breeding activity in the UK feeds into its parent company's European breeding programme which is also paying close attention to phoma resistance and vice versa.

Changing resistance is a driver which has resulted in the discovery and inclusion of the RlmS phoma resistance gene, says Chris. "We're seeing Rlm7 begin to break down, as we've seen previously in France, and this is more evident in certain varieties and more than others. This year we noticed severe late season phoma stem canker at our trial site near Wisbech in North Cambridgeshire, with instances of varieties featuring *Rlm7* significantly impacted late in the season. If this is the case at our trials site, then resistance out in the field is obviously changing too."

Because of the severity of the phoma stem canker infections in high-risk areas this year, Chris has observed cases of lodging and yield reduction in certain varieties. "This has been more prevalent this year than we've seen in the past.

"If we rely too heavily on a single resistance gene, this will inevitably happen. To try to combat this, there's been a lot of work across many European breeding programmes which are attempting to bring in other sources of resistance. As a result, breeding priorities are very different to what they were five years ago. It's really important that we're producing varieties with genetic diversity, diversity of major gene resistances and quantitative resistances, which are also robust across different seasons, and which can cope with variability in a single year."

RL reference

Although phoma isn't at concerning levels in Scotland, Fiona feels that selecting varieties with resistance to the disease is worthwhile further south in the UK. "It's the easiest thing you can do to manage risk. There are plenty of varieties on AHDB's Recommended List with resistance to phoma and light leaf spot that also yield well."

This will also play into fungicide resistance management, she adds. "We know fungicides aren't invincible, so pairing a decent variety with your fungicide programme gives protection from two directions, and will help to prolong the efficacy of actives and genetic resistance of the varieties."

But Grant advises that phoma infection levels don't yet have to dictate variety choice in Scotland. "If a variety has a good enough light leaf spot score to be on the RL, it usually has a reasonable phoma score and I think it'll be a while before we have to grow a really resistant variety."

Fiona admits that sometimes determining whether a crop requires an autumn fungicide in Scotland can be a difficult decision to make. "In some cases, you might choose to leave an application until the spring, and in situations where the light leaf spot infection is late, this works well. But if the infection comes in early and you've left it then it's had time to cause damage. But this is unfortunately something you can only know with hindsight, meaning that taking the protectant approach is often advisable, but this can be a tough decision when margins are tight."

According to Grant, there are benefits of an autumn fungicide spray in Scotland. "Nobody likes recreational spraying, but where a crop is small or backwards in the autumn, it can be worth making sure it has every chance of making it through the winter. If you get 5-10% infection of light leaf spot on a plant because you haven't applied a fungicide, this will have a significant impact."

A further consideration is to help preserve efficacy, says Fiona. "We know that there's a wide range in the degree of sensitivity of light leaf spot to azole actives, which is a worry because of how reliant on these we've been, but we now have SHDI and strobilurin products to help widen programmes and reduce the risk of resistance building to a single active."

"Balancing all-round resistance is key to covering these diseases," advises Chris. "And because we don't know what weather we can expect each year, light leaf spot or phoma could be a big problem one year and not the next, which is why marrying up good, solid disease resistance with gross output is so important, because it provides some security."

One thing for certain is that the climate is warming, says Fiona. "The pressure to produce more food on the same amount of land is as high as it's ever been. With the markets as a key driver, we'll keep growing OSR and I suspect the weather will become more conducive to disease so using all the tools at our disposal will be vital." ■

Oilseed rape crops being in the ground longer because of early drilling is producing a change in disease pressure.