



AHDB

*from theory
to field*

Futureproofing fungicides

It might be desirable to imagine a world where fungicides aren't necessary, but the fact is they're a fundamental pillar supporting effective crop production. CPM explores the value of independent oilseed rape fungicide trials.

By Melanie Jenkins

The greatest will in the world can't avoid the reality that oilseed rape diseases won't be going anywhere anytime soon, and effective management will, more often than not, involve the use of fungicides.

This is why independent knowledge of the potential protective and curative properties of active ingredients and formulated products is so important. "It not only allows growers to select the most effective actives but it also indicates which products should produce the best return on investment," explains Catherine Harries of AHDB.

"This is becoming increasingly important for growers as integrated pest management (IPM) comes to the fore of many agendas, meaning focus has shifted to reducing and optimising fungicide use as well as using the most appropriate dose rates."

Originating off the back of the wheat and barley fungicide performance projects, established in 1994 and 2002, respectively, the OSR project has been running since

2006. The focus diseases include phoma stem canker and light leaf spot, and up until 2017 the project also included sclerotinia stem rot.

A series of six trials were originally conducted — two on phoma, two on light leaf spot and two on sclerotinia — in high disease-risk areas to understand how much fungicide was required for effective control, says Faye Ritchie of ADAS. "Different areas of the country have different challenges, so locating the trials in high pressure areas allows us to effectively test products."

Focus diseases

Because phoma and light leaf spot are the two most economically important diseases for OSR in the UK, these are the focus of the project, says Catherine. "Now, four trial sites are included in the series, using varieties which are highly susceptible to the respective diseases being tested. These trials are truly independent, with all products tested and compared on a level playing field, meaning we can dip into the strengths and weaknesses of each active."

Typically, fungicide performance trials on cereals test a single active ingredient, but many products in the OSR trials are co-formulated, says Faye. "This provides accurate data on how the product, rather than the individual active performs."

A number of different dose rates are tested to allow for the accurate production of a dose response curve. Starting with no fungicide applied, then 25%, 50%, 75% and up to 100% of the recommended label rate. "Fungicide application timings are broadly similar to commercial practice," she explains.

In August each year, the trials team invites agrochemical companies to submit

“ Breeders are working hard to produce more resistant varieties, but having data on fungicide performance is fundamentally still important. ”

products, which can be conventional or biological, for inclusion in the trials. "We identify suitable trial sites and varieties in consultation with NIAB and SRUC and put protocols in place for fungicide applications and disease assessments, which are carried out by our field teams — who are key to delivering the trials. They monitor disease levels and once a certain parameter is reached the test treatment sprays are applied. For example, once phoma leaf spotting reaches 10-20% the crop is sprayed, and this is followed up four-to-six weeks later."



AHDB has been running an independent oilseed rape fungicide performance project since 2006.

Phoma stem canker assessments happen at the end of the season, whereby the severity of the disease on the stem provides a good indication of how a fungicide has performed, says Faye. “Sometimes, depending on the season, we’ll notice the level of control we expected wasn’t achieved and we can look back at weather data and other factors to understand why this occurred and how products performed.”

Light leaf spot control is assessed differently. “We determine this based on the percentage of the leaf area that is affected. Although 3-4% disease on average on a plant might sound low, there is often larger amounts of disease present than we can measure visually, which can result in lost yield. Some might wonder why 6% infection on plants results in a 0.5t/ha yield loss, but this is a reflection of how much this unseen disease has impacted the crop.”

Sclerotinia stem rot trials – although popular — came to an end several years ago. “Despite the last set of data being from 2017 it’s still proving relevant today,” says Faye. “Two products have come to the market after the trials ended — Aviator Xpro (bixafen+ prothioconazole) in 2020, and Shepherd (boscalid+ pyraclostrobin) in 2021. Both were tested before the trial series ended, and so the legacy data was available for their commercial launch.”

Although verticillium is another problematic disease, because there are no fungicides to control it, it isn’t included in the OSR fungicide performance project. “However, data on varietal resistance will be available on AHDB’s Recommended List for the first time when the 2024/25 tables are released later this year,” says Catherine.

The trials are designed to give an independent evaluation of both existing and new products, she explains. “It’s really

important that AHDB is able to support these trials because it’s the only open source of this type on fungicide performance in this country. There are other trials being conducted, but these don’t provide independent information.”

And beyond indicating the performance of individual active ingredients, Catherine highlights that the data is fed into other research projects, as well as the Fungicide Resistance Action Group (FRAG-UK). “The project produces and provides long-running information that the entire industry can access and use.”

New releases

But what about when new products come to the market? The project will start testing new products before registration. Therefore, when they become commercially available to farmers, the independent fungicide data is available to help with decision-making, says Faye. “This was the case with Aviator Xpro, Shepherd and Architect (Mepiquat chloride+ prohexadione calcium+ pyraclostrobin) — several more recently registered products — and we had good datasets before launch because we were able to test it in trials ahead of registration.”

Over time, the trials have helped to identify the benefits of new chemistry and helped expand the use of different modes of action. “When the trials first began, the industry was very reliant on azole chemistry,” she explains. “But our research has shown the effectiveness of new chemistry and how it can be a step ahead of the older options.”

“It’s allowed the industry to understand the performance of SDHIs and strobilurins against phoma stem canker and light leaf spot, meaning different modes of action can be introduced throughout the programme to help with fungicide resistance management



The fungicide performance trials are designed to give an independent evaluation of both existing and new products, says Catherine Harries.

strategies. Further to this, the research has allowed for azoles to be tactfully positioned in programmes to get the best out of them and help prolong their effectiveness.

“We know that fungal pathogens are demonstrating reduced sensitivity to some fungicides, meaning there’s concerns surrounding their decline in efficacy. That’s why it’s so important to use a range of modes of action, in alternation or as mixtures/co-formulations, throughout the fungicide programme. Pathogens are always changing, so we have to be smarter.”

The trials have also identified that against phoma stem canker, half the recommended label rate applied twice is usually fine. “This really shows that you don’t have to overspend against this disease — so economically, the data produced by the trials is very valuable.”

From the 2022 trial series, it was established that there are effective azole and non-azole options for the disease, she says. ▶

Commercial view

It’s not just growers and agronomists who see the benefit from the fungicide performance project, but also the agrochemical companies whose fungicides are included in the trials. Clare Tucker of BASF believes the whole industry feels the benefits of the data produced.

“We’re all doing our own research, but the AHDB project supplements it well. It uses an established set of protocols repeated year-on-year to produce a large set of performance data across different seasons,” she says. “Meaning there’s a wealth of data to interpret and the consistency of fungicides can be tested.”

Assessing OSR diseases can be tricky,

requiring specialist knowledge, but Clare points out that the researchers involved with the project provide that expertise. “Not just the trial assessment, but just as importantly, the interpretation of the data is conducted by experts which results in solid conclusions meaning the industry has great confidence in the project.”

Because of this, firms such as BASF feel assured in using the data to give advice on appropriate dose rates, where in the programme to use their products, and the most suitable application timings, she explains. “The data is presented accessibly with strong, practical recommendations for implementation on farm.”



Assessing OSR diseases can be tricky, requiring specialist knowledge, but Clare Tucker points out that the teams at ADAS and SRUC involved with the project are experts.



Faye Ritchie hopes to see more integrated disease management approaches being applied to oilseed rape disease management in future.

► “Newer products have brought advantages to both disease control and yield, particularly when conditions are more favourable for disease development.”

Yield responses ranged from 0.4t/ha to 1.0t/ha in 2022, with little benefit from applying above half of the full label rate (as part of a two-spray programme). “Over-years results show that the responses in phoma stem canker control and yields were more evident in high disease pressure situations,” she adds.

Light leaf spot disease levels were low in 2022 trials, but the longer-term data set provided information on product performance with both azole and non-azole chemistry providing similarly effective control and yield benefits.

“The yield responses to fungicide application, from an untreated control of 3.5t/ha, ranged from 0.3t/ha to 0.6t/ha. Generally, the newer products performed better,” says Faye. “Often, there was little benefit from using above half of the full label rate, when applied as part of a two-spray programme. However, optimum dose and yield response is both site and situation-specific for light leaf spot.”

“From our experience, good light leaf spot control is only achievable when fungicides are applied at exactly the right time, usually with the first spray from October onwards and as soon as visible symptoms are seen early in the new year. This is straightforward to achieve in trials, but far harder with commercial applications, and this is where varieties with higher resistance ratings (7 and above) can really help.”

“Breeders are working hard to produce more resistant varieties, but having data on fungicide performance is fundamentally still important as it enables an integrated approach to disease management,” she adds.

Faye hopes to see more integrated

Oilseed rape products in trials

Product	Active(s)	Mode of action
Proline 275	Prothioconazole	DMI
Priori Gold*	Azoxystrobin+ difenoconazole	QoI+ DMI
Aviator 235 Xpro	Bixafen+ prothioconazole	SDHI+ DMI
Filan*	Boscalid	SDHI
Architect**	Mepiquat chloride+ prohexadione calcium+ pyraclostrobin	QoI
Shepherd**	Boscalid+ pyraclostrobin	SDHI+ QoI
Plover	Difenoconazole	DMI
Amistar	Azoxystrobin	QoI
Pictor	Dimoxystrobin+ boscalid	QoI+ SDHI

Source: AHDB oilseed rape fungicide performance reports

*Products don't have a label recommendation for light leaf spot control but may be applied at the appropriate time to control other diseases.

**Products registered in 2021.

disease management approaches being applied to OSR disease control in future. “I think there's a lot of appetite for research into how to integrate varieties and fungicides, and understand the associated environmental, sustainability and economic costs. This information will also help the industry maintain effective disease control and fungicide resistance management over a longer period of time.”

Wider scrutiny

A 2021 independent evaluation of the project to determine whether it's fit for purpose involved interviewing agronomists to establish what benefits they felt their growers were getting from it, explains Catherine.

A total of 150 farmers were represented by the agronomists interviewed. This suggested a typical net yield gain worth £17.67/ha was associated with a change to a superior fungicide product. “The general feeling was that there was a good cost benefit to the project.”

But a few areas for improvement were identified, she adds. “Agronomists generally felt well informed by the data but there was scope to make it more readily available to growers.”

As a result, a future aspiration for the project is to make it more accessible to levy payers, explains Catherine. “There's a lot of technical and statistical content available on slide decks on AHDB's websites but it's historically been targeted at agronomists and currently it's only presented once a year at the Agronomy Conference (formerly Agronomists' Conference). But we feel it's really important that farmers are aware of the data and can use it themselves to help empower their management.”

“So we're working towards presenting the data to farmers directly at Monitor Farm and strategic events, with the hope of being able to start doing this from the coming winter.” ■



Disease levels are monitored at trial sites and once a certain level is reached the test treatment sprays are applied.

Research roundup

From Theory to Field is part of AHDB's delivery of knowledge exchange on grower-funded research projects. CPM would like to thank AHDB for its support and in providing privileged access to staff and others involved in helping put these articles together.

For further info:

AHDB Project No 21120013 'Fungicide

performance in wheat, barley and oilseed rape (2018-22)' was carried out by ADAS, Harper

Adams University, NIAB and SRUC during 2018-2024 at a cost of £732,234 to AHDB.

For more detail about the project:

<https://ahdb.org.uk/fungicide-performance>



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