

January 2023



Annual Report

Fungicides for phoma stem canker control in winter oilseed rape

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1. Background

Fungicides for control of phoma leaf spot and stem canker in winter oilseed rape have been evaluated for over ten years at ADAS Boxworth, Cambridgeshire and ADAS Terrington, Norfolk. During 2017 to 2022, the ADAS Boxworth trial has been done near ADAS Rosemaund, Herefordshire. All trials are conducted on phoma susceptible varieties with good resistance to light leaf spot. Products are tested at four doses ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full label rate) as two-spray programmes, plus a completely untreated control. The first fungicide application is in early autumn (ideally 20–40% plants affected and, usually, in October) with a second application 4 to 10 weeks later (November/December) when re-infection is apparent. Leaf disease assessments are done after each application and stem canker assessed in late June (presented as a canker index 0 to 100; with 0 being no infection and 100 being whole plant dead). Yield data are adjusted to 91% dry matter. Priority for inclusion for testing is given to products not currently approved. This allows independent data to be available when they come to market. Data in this report starts from 2016 and focuses on the efficacy of products that have recently been approved for use in oilseed rape, as well as industry standards. Products tested have included azole solo (Proline 275 and Plover), SDHI solo (Filan), QoI (Architect), QoI + azole co-formulation (Priori Gold), QoI + SDHI co-formulation (Shepherd) and SDHI + azole mixture (Aviator Xpro). Not all products were included in all years. Other historic data are available on the AHDB website: ahdb.org.uk/fungicide-performance

2. Results

2.1. Harvest year 2022 and cross-site analysis (2015 to 2022)

Stem canker severity was moderate at Terrington (index 43, untreated) and moderate at Rosemaund (index 30, untreated) prior to harvest in 2022. The first signs of phoma leaf spot were seen at both sites in early November. At Terrington, the first treatments were applied on 23 November 2021 at the 9-leaf stage (12% phoma leaf spot incidence, 0.1% leaf area affected). At Rosemaund, first sprays were applied on 11 November 2021 (28% phoma leaf spot incidence; 0.2% leaf area affected) at the 7-leaf stage. The second spray at Terrington was applied on 6 January 2022 at BBCH 19 (42% phoma leaf spot incidence; 0.2% leaf area affected) and at Rosemaund on 15 December 2022 at the 9-leaf stage (52% phoma leaf spot incidence; 0.3% leaf area affected).

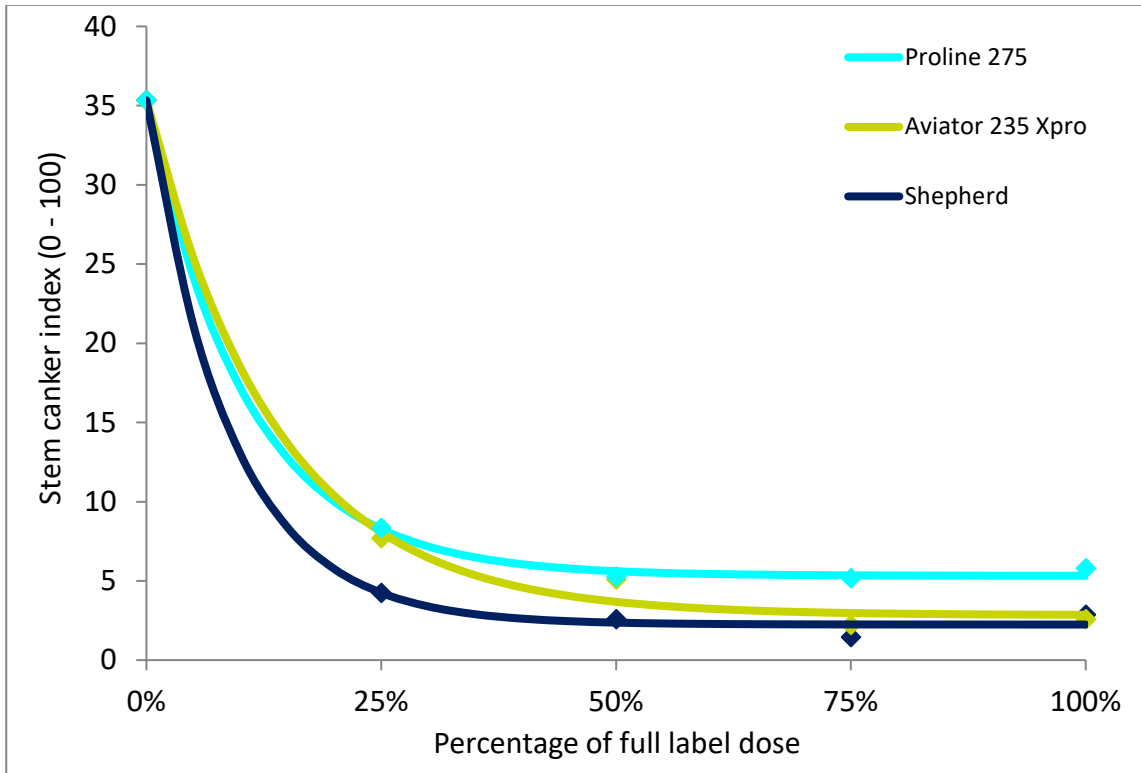
At the Terrington site, Proline, Aviator Xpro and Shepherd reduced the stem canker index from 43 to between 7 and 21. At the Rosemaund site, the index was reduced from 30 to between 1 and 4 (data not shown). A cross-site analysis (across both sites) showed a reduction in stem canker index for Proline, Aviator Xpro and Shepherd from 35 to between 1 and 8 (Figure 1a), with yield

responses for Proline, Aviator Xpro and Shepherd at 50 to 100% dose of between 0.3 and 0.9 t/ha (untreated = 3.80 t/ha) (Figure 1b).

A cross-site analysis was conducted using data from twelve trials harvested from 2015 to 2022 (Figure 2a). Stem canker index was reduced following application of Proline, Priori Gold and Filan, which decreased the mean index from 48 untreated to between 10 and 22, or application of Aviator Xpro, Architect and Shepherd, which decreased the index to between 5 and 16. The cross-site analysis showed that yield responses to fungicides at the 50% dose for Plover, Filan and Priori Gold were 0.3 to 0.4 t/ha and for Proline 275, Aviator Xpro, Architect and Shepherd 0.4 to 0.5 t/ha (untreated = 3.60 t/ha) (Figure 2b). For all products, little or no further increases in yields were observed at the 100% dose.

Further separation of fungicide products was seen when a cross-site analysis was conducted from two high-pressure sites, where there was an average untreated stem canker index of 78. At 50% dose, Proline and Priori Gold reduced the stem canker index to between 45 and 50, Filan, Aviator Xpro and Architect reduced the index to between 30 to 35, and Shepherd decreased the index to 20 (Figure 3a). For all products, little or no further decreases in stem canker were observed at the 100% dose. A similar trend was seen for yield responses (untreated = 2.1 t/ha), where Plover, Filan and Proline increased yield by 0.4 to 0.5 t/ha, and Priori Gold, Aviator, Architect and Shepherd increased yield by 0.7 to 0.8 t/ha at the 50% dose, with no further benefit in yield from increasing the dose to 100% (Figure 3b).

a.



b.

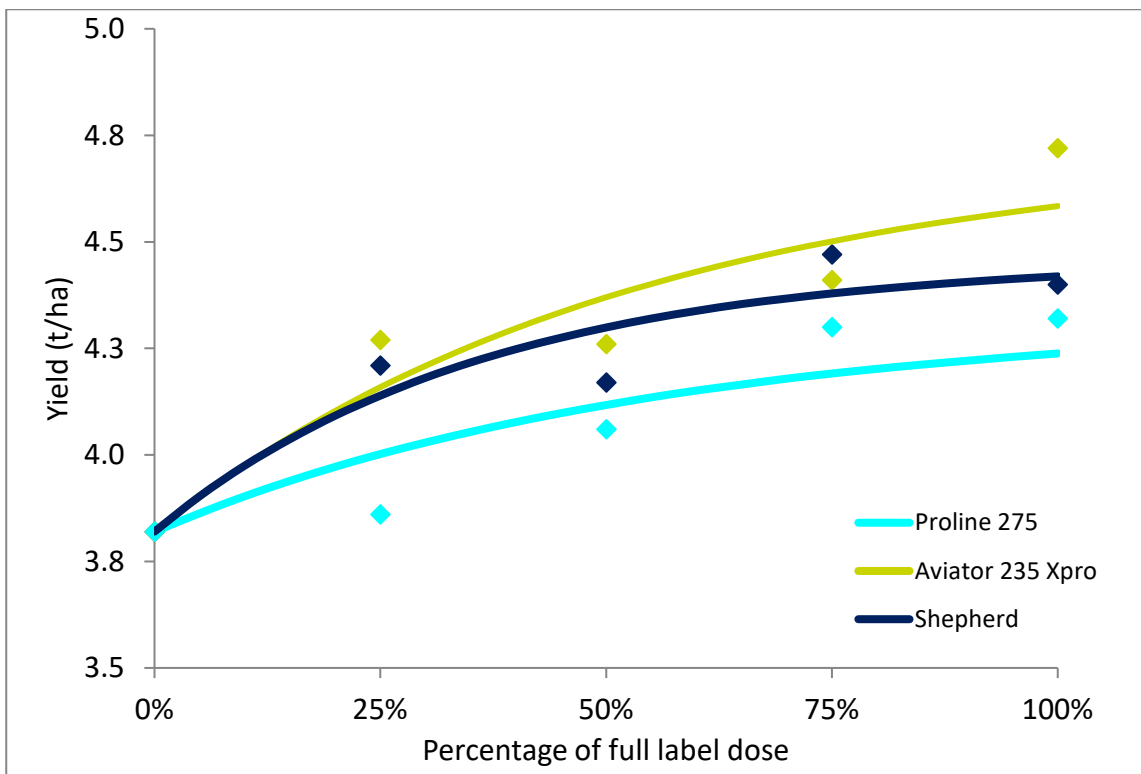
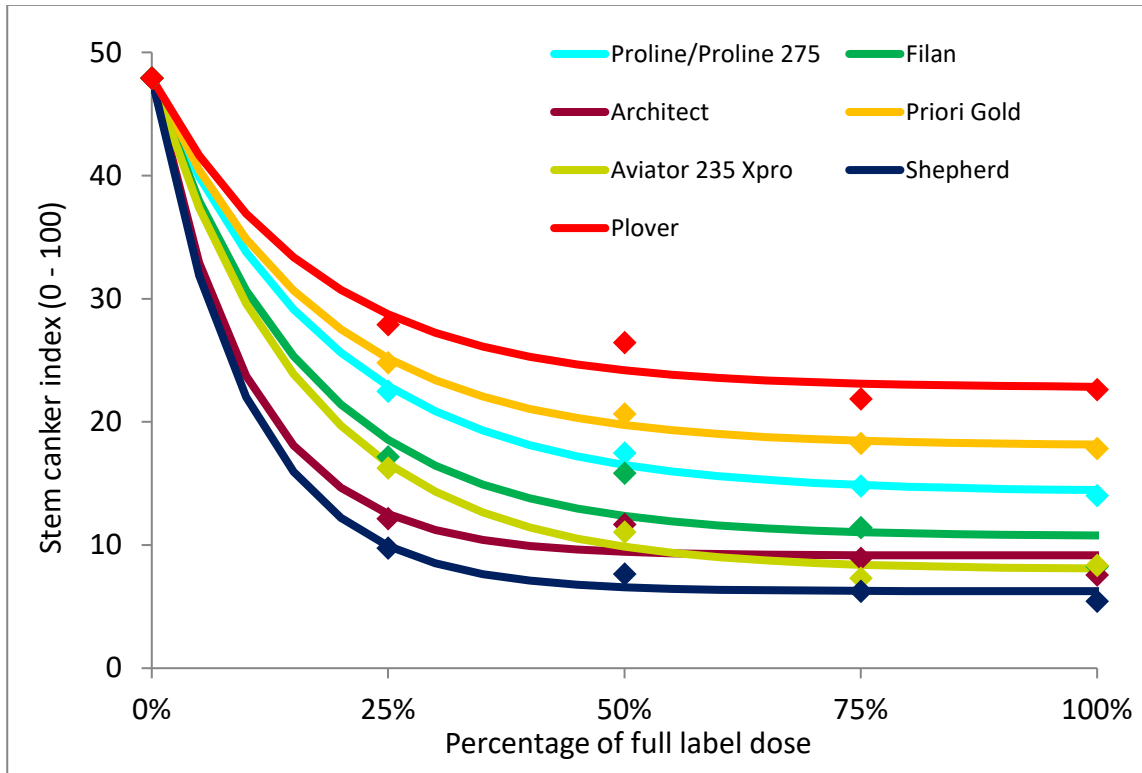


Figure 1. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Norfolk and Herefordshire in two trials conducted 2021/2022.

a.



b.

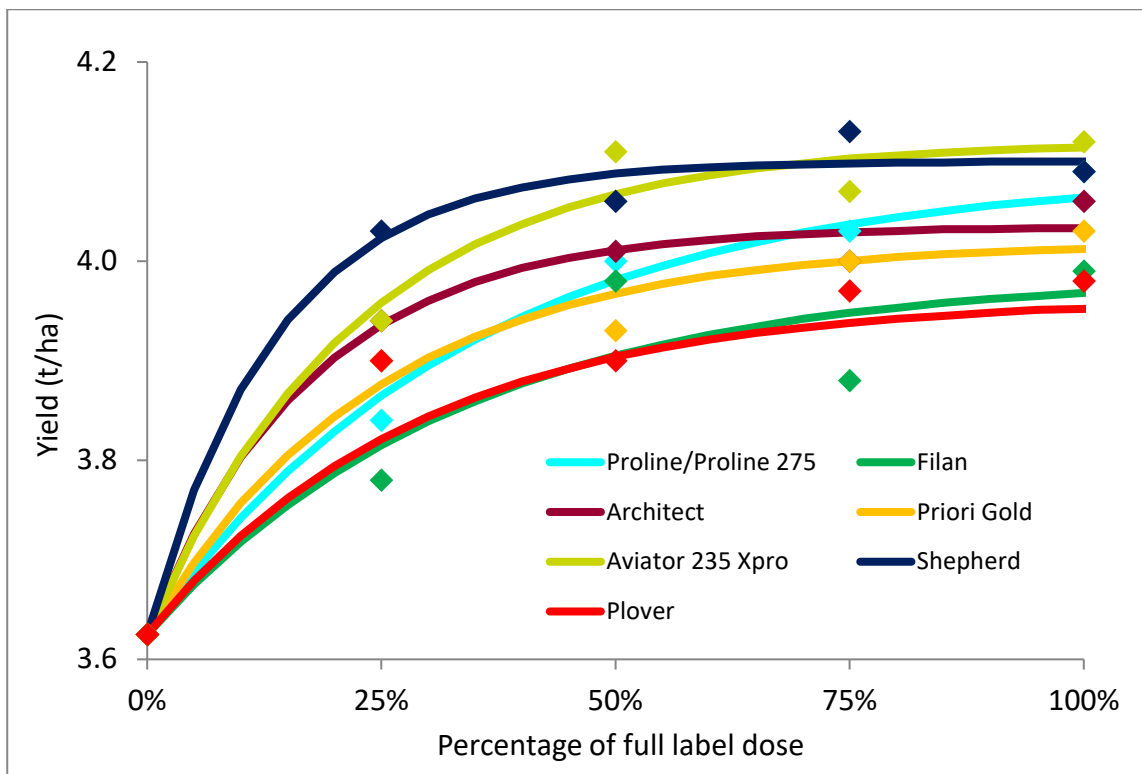
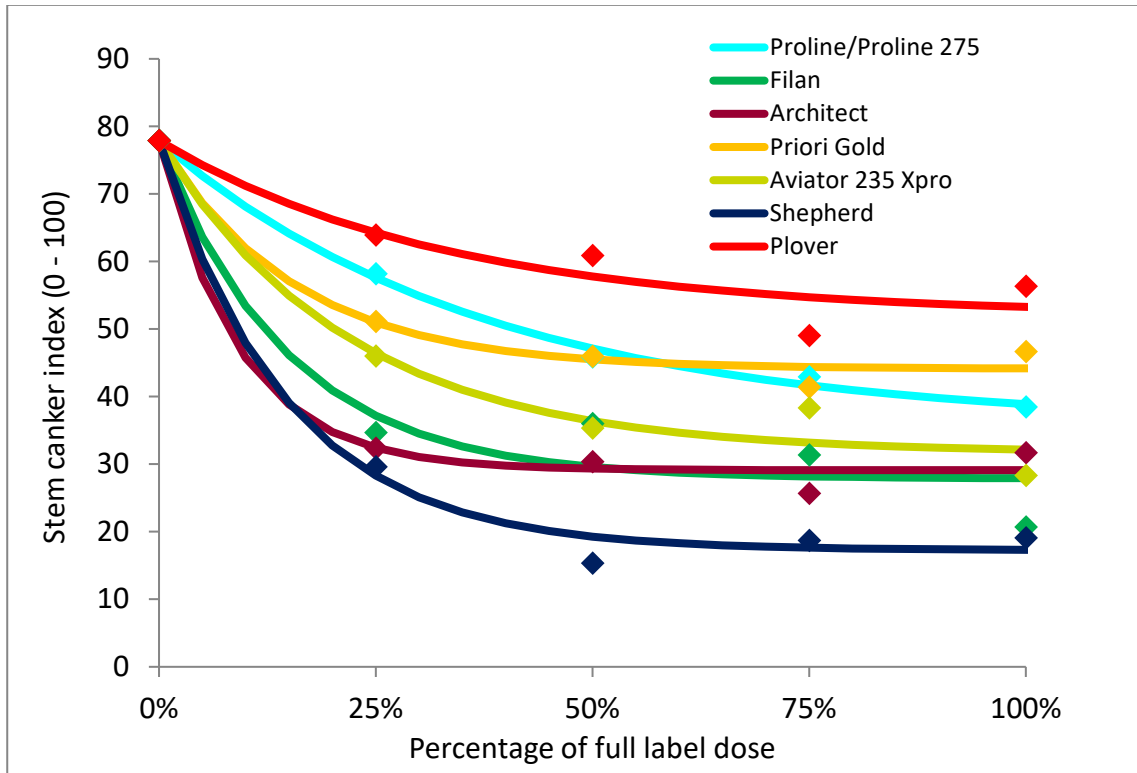


Figure 2. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Norfolk and Herefordshire in twelve trials conducted in 2015 to 2022.

Note that Plover is restricted by a maximum total dose that is equivalent to a single full rate application. Therefore, the 2 spray programmes exceeding $2 \times \frac{1}{2}$ rate are above the maximum recommended dose.

a.



b.

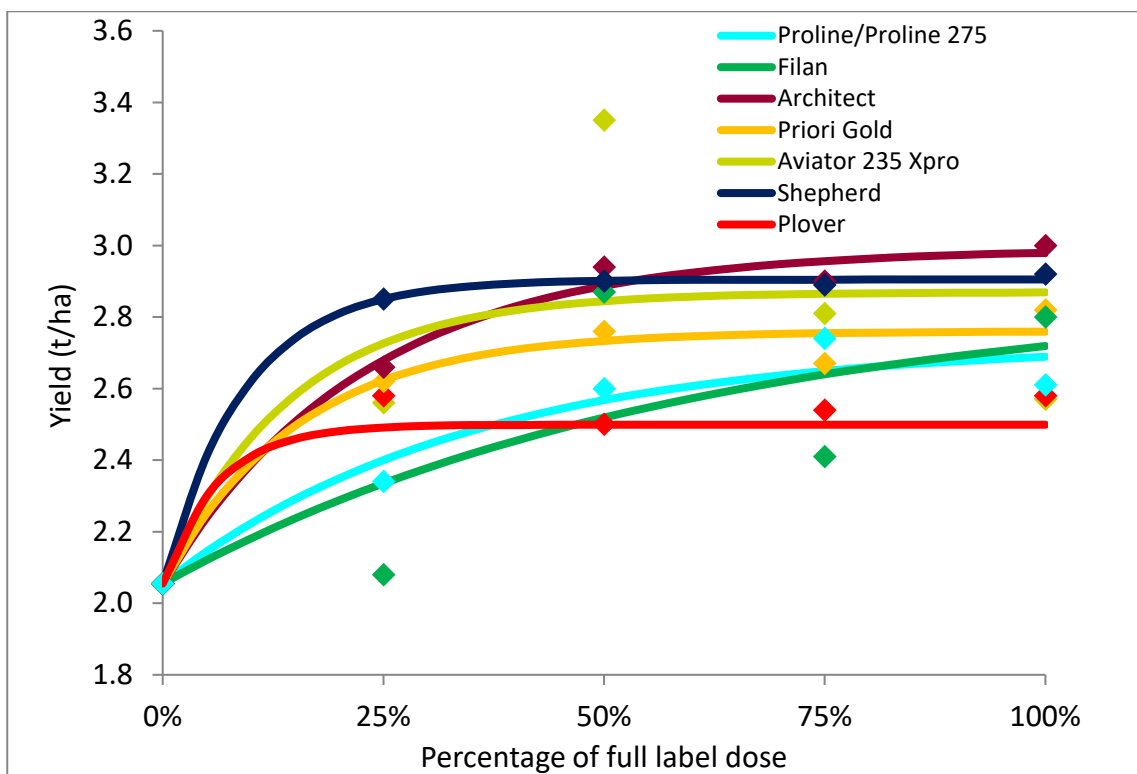


Figure 3. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in two trials conducted in high pressure seasons.

Note that Plover is restricted by a maximum total dose that is equivalent to a single full rate application. Therefore, the 2 spray programmes exceeding $2 \times \frac{1}{2}$ rate are above the maximum recommended dose.

3. Managing phoma leaf spot/stem canker risk in harvest year 2023

Use the phoma forecast on the AHDB website (ahdb.org.uk/phoma-leaf-spot-forecast) to guide crop monitoring and to plan fungicide applications. In most areas, the first leaf spotting was observed between the early to mid-November in 2022, which is later than last year. Many crops already reached threshold with the first fungicides applied. Therefore, field monitoring for re-infection from now onwards will be important. Later drilled crops often result in smaller plants over the winter and are at a higher risk when infections occur. Late epidemics, occurring in February/March, can be very damaging, if plants are small in late autumn or winter. Larger plants are less susceptible to phoma at this time and a fungicide application is unlikely to be necessary.

Fungicide application timing is important, and the first application should be made on crops (RL rating 7 and below) when 10 to 20% of plants have phoma leaf spot and plan a second application when re-infection is evident (4 to 10 weeks later). Note some varieties with high resistance ratings for stem canker (RL rating 8 and above) also have good resistance to phoma leaf spot and may not require a phoma fungicide, unless the 20% threshold is exceeded. Some varieties are likely to require an autumn fungicide (November) for light leaf spot control if there is a risk. This should be considered when planning autumn programmes.

Good control of phoma leaf spot and stem canker can be achieved with two sprays at half the label recommended rate. Early phoma epidemics are the most damaging to yield, and, typically, put 0.5 t/ha of yield at risk, although rapid re-infection in the autumn can also reduce yields. It should be noted that all modes of action offer protection when applied prior to infection.

Using a range of modes of action, in alternation or as mixtures/co-formulations throughout the fungicide programme, is necessary as part of a robust fungicide resistance management strategy to prevent the selection for fungicide insensitive strains. There is now a range of modes of action available, including azole and non-azole options, for the control of phoma leaf spot/stem canker. When preparing a fungicide programme, always follow the latest [fungicide resistance management guidelines](#).