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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 have been evaluated for over ten years at ADAS Boxworth, Cambridgeshire and ADAS Terrington, Norfolk. In 2017 to 2023, the ADAS Boxworth trial was moved to ADAS Rosemaund, Herefordshire. All trials are conducted on phoma stem canker 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 an untreated control. Label restrictions may apply where products are used as part of two-spray programmes and should be checked for guidelines on maximum individual dose, total dose and application timings. The first fungicide application is in early autumn (ideally 20-40% plants affected and usually 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 equals whole plant dead). Combine harvested yield data are adjusted to 91% dry matter. Priority for inclusion for testing in this project is given to products not currently approved to allow independent data to be available when they come to market. Data in this report starts from 2016 onwards and focuses on the efficacy of products that have recently been approved for use in oilseed rape. Products tested included azole solos (Proline 275, Plover and Toledo), SDHI solo (Filan), QoI (Architect), QoI + azole co-formulation (Priori Gold), QoI + SDHI co-formulation (Shepherd) and an SDHI + azole mixture (Aviator Xpro and Propulse). Other historic data are available at ahdb.org.uk/fungicide-performance

2. Harvest year 2023

Stem canker severity was moderate to high at Terrington (index 50 in untreated) and moderate at Rosemaund (index 37 in untreated) prior to harvest in 2023. The first signs of phoma leaf spot were seen at both sites in mid-November. At Terrington, the first treatments were applied on 25 November 2022 at the 9-leaf stage (38% phoma leaf spot incidence, 0.1% leaf area affected). At Rosemaund, first sprays were applied on 18 November 2022 (32% phoma leaf spot incidence; 0.2% leaf area affected) at the 7-leaf stage. The second spray at Terrington was applied on 5 January 2023 at BBCH 19 (90% phoma leaf spot incidence; 0.4% leaf area affected) and at Rosemaund on 6 January 2023 at the 9- leaf stage (60% phoma leaf spot incidence; 0.4% leaf area affected).

At the Terrington site, Toledo reduced the stem canker index from 50 to 23, Proline, Priori Gold and Plover reduced the stem canker index to between 13 and 8, and Aviator Xpro and Propulse to 4 when applied at 50% dose (Figure 1a). Yield responses at 50 to 100% dose ranged from 0.6 t/ha for Toledo, 0.8 t/ha for Priori Gold, 0.9 t/ha for Proline and Plover, 1.0 t/ha for Propulse to 1.2 t/ha for Aviator Xpro (untreated = 3.20 t/ha) (Figure 1b).

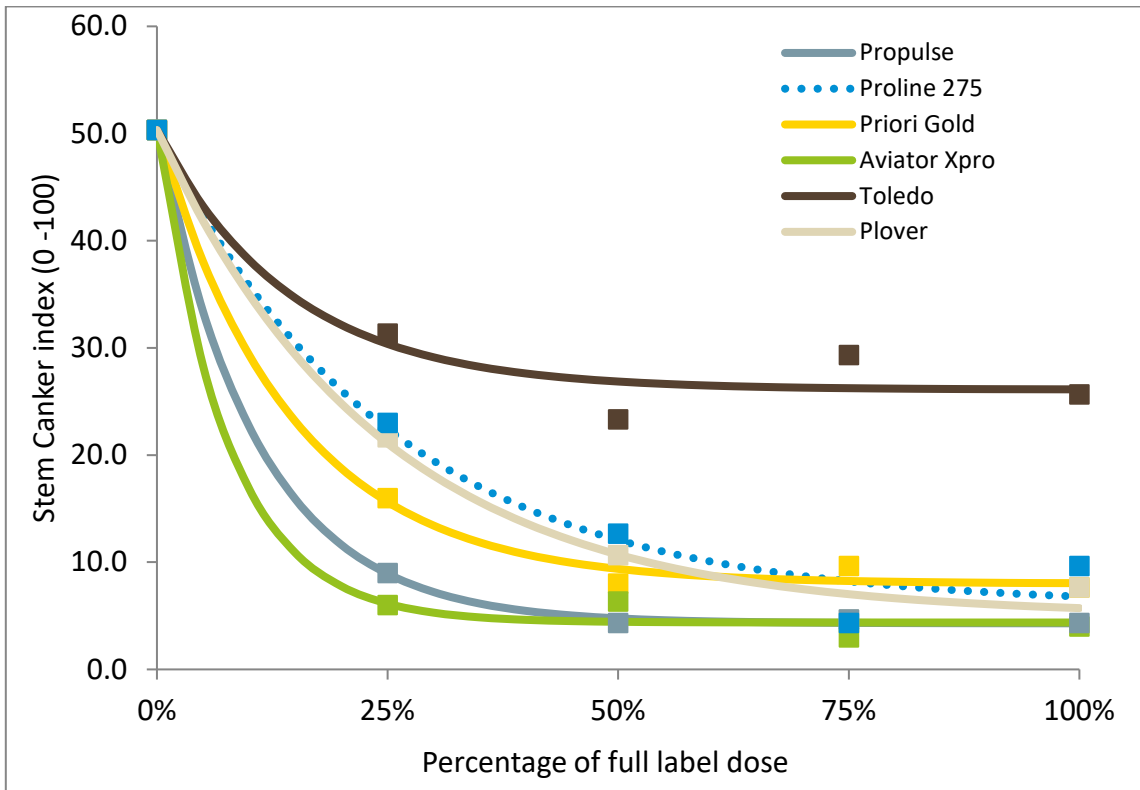
At the Rosemaund site, Toledo reduced the stem canker index from 37 to 20, Plover reduced the stem canker index to 14, Proline, Priori Gold, and Aviator Xpro and Propulse to between 11 and 7 when applied at the 50% dose (Figure 2a). Yield responses at 50 to 100% dose ranged from 0.1 t/ha for Toledo, 0.2 to 0.3 t/ha for Proline, Plover, Priori Gold and Propulse to 0.3 to 0.4 t/ha for Aviator Xpro (untreated = 3.40 t/ha) (Figure 2b).

A cross-site analysis (both sites) showed a mean untreated stem canker index of 43 with a reduction for Toledo to 22, Proline, Priori Gold and Plover between 12 and 8, and Aviator Xpro and Propulse to between 6 and 4 when applied at 50% dose (Figure 3a), and yield responses at 50 to 100% dose of 0.4 t/ha for Toledo, 0.5 to 0.7 t/ha for Proline, Plover, Priori Gold and Propulse and 0.8 t/ha for Aviator Xpro (untreated = 3.30 t/ha) (Figure 3b).

3. Cross-site analysis (2015 to 2023)

A cross-site analysis was conducted using data from 14 trials harvested from 2015 to 2023 (Figure 4a). Stem canker indices were decreased following application of Plover, Proline, Priori Gold and Filan, to between 10 and 25, and for Aviator Xpro, Propulse, Architect and Shepherd indices were decreased to between 5 and 15. Cross-site analysis showed that yield responses to fungicides at the 50% dose for Toledo was 0.1 t/ha, Plover, Filan and Priori Gold was 0.2 t/ha, Proline 275, Propulse and Architect 0.3 t/ha, and Aviator Xpro and Shepherd 0.4 to 0.5 t/ha (untreated = 3.70 t/ha) (Figure 4b). For most products, little or no further increases in yields or stem canker reduction were observed at the 100% dose.

a.



b.

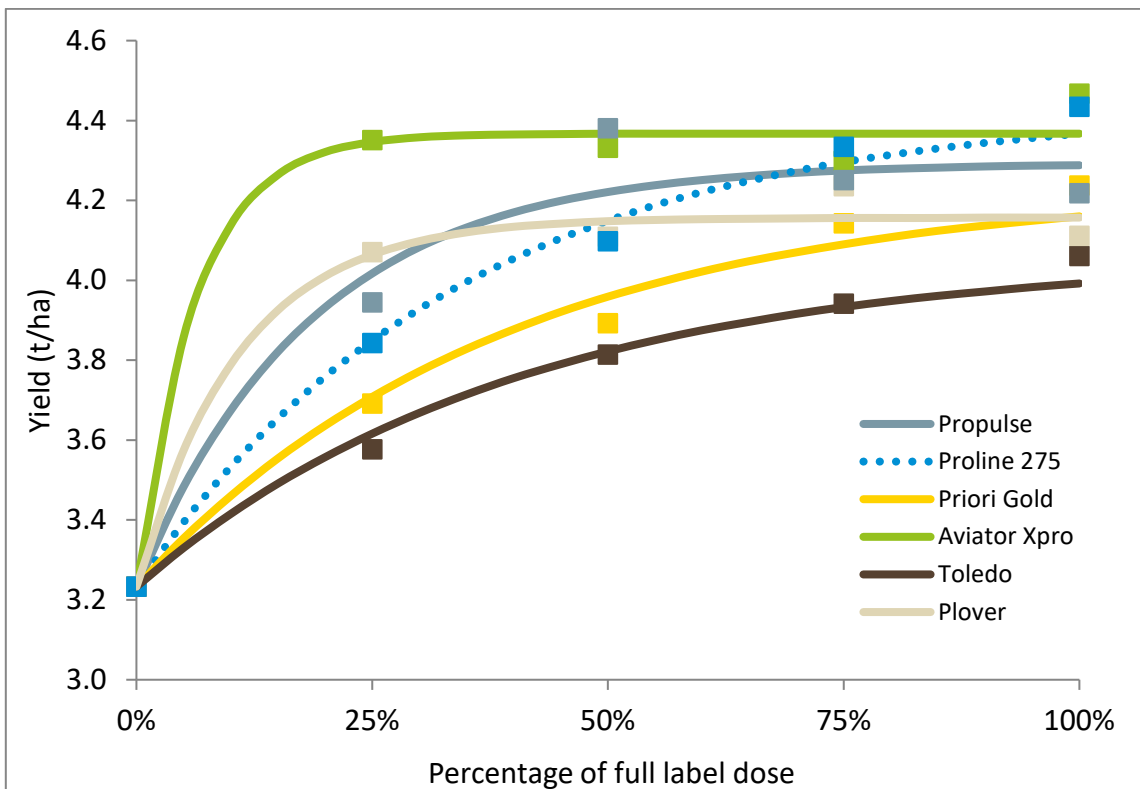
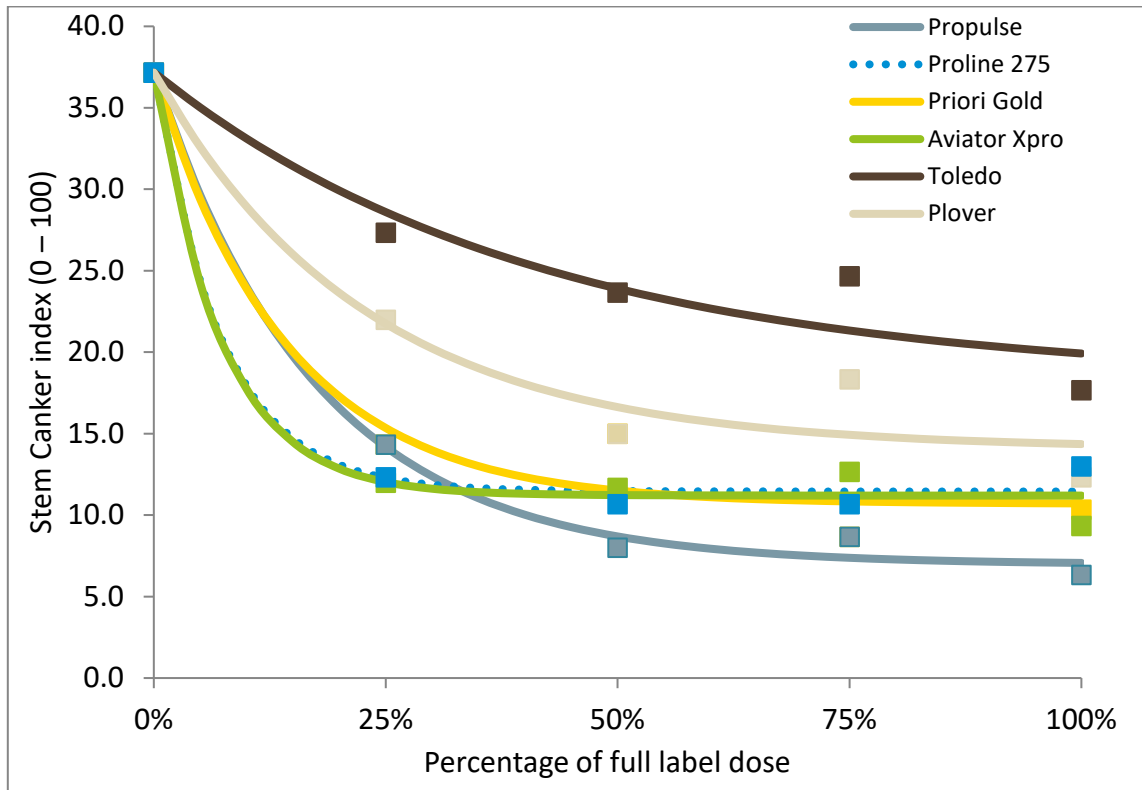


Figure 1. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Norfolk in one trial conducted 2022/2023

a.



b.

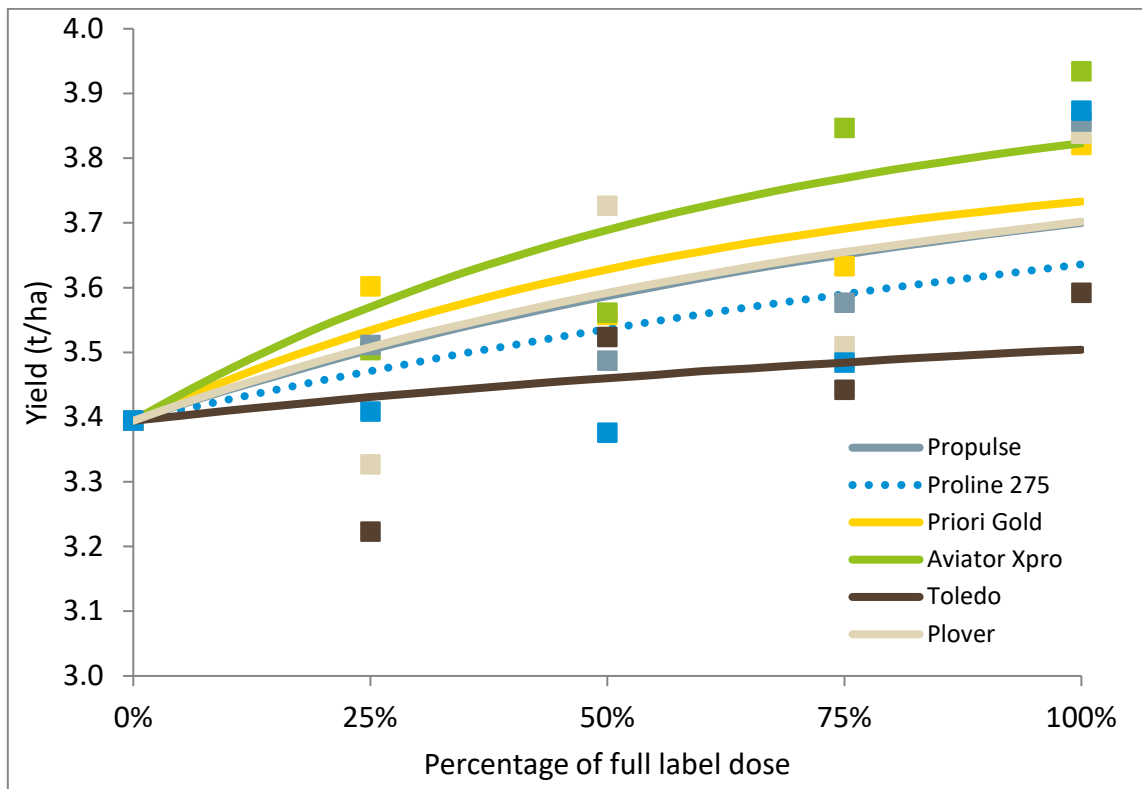
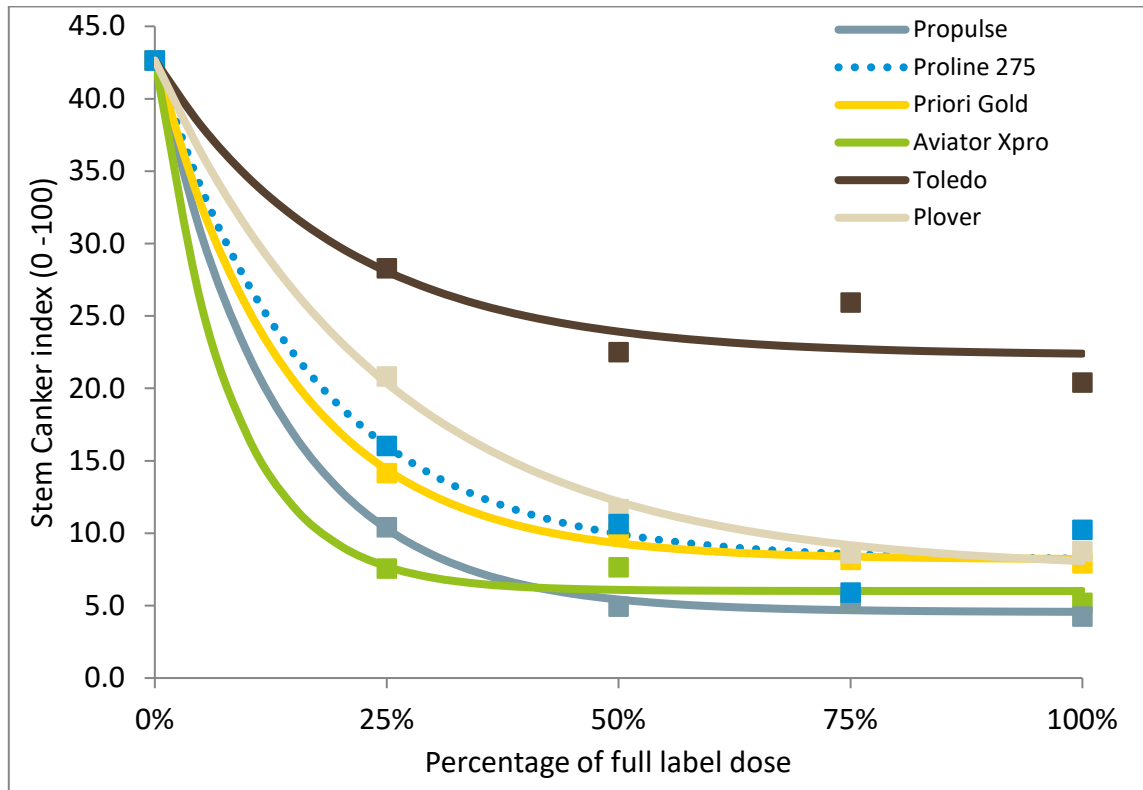


Figure 2. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Herefordshire in one trial conducted 2022/2023

a.



b.

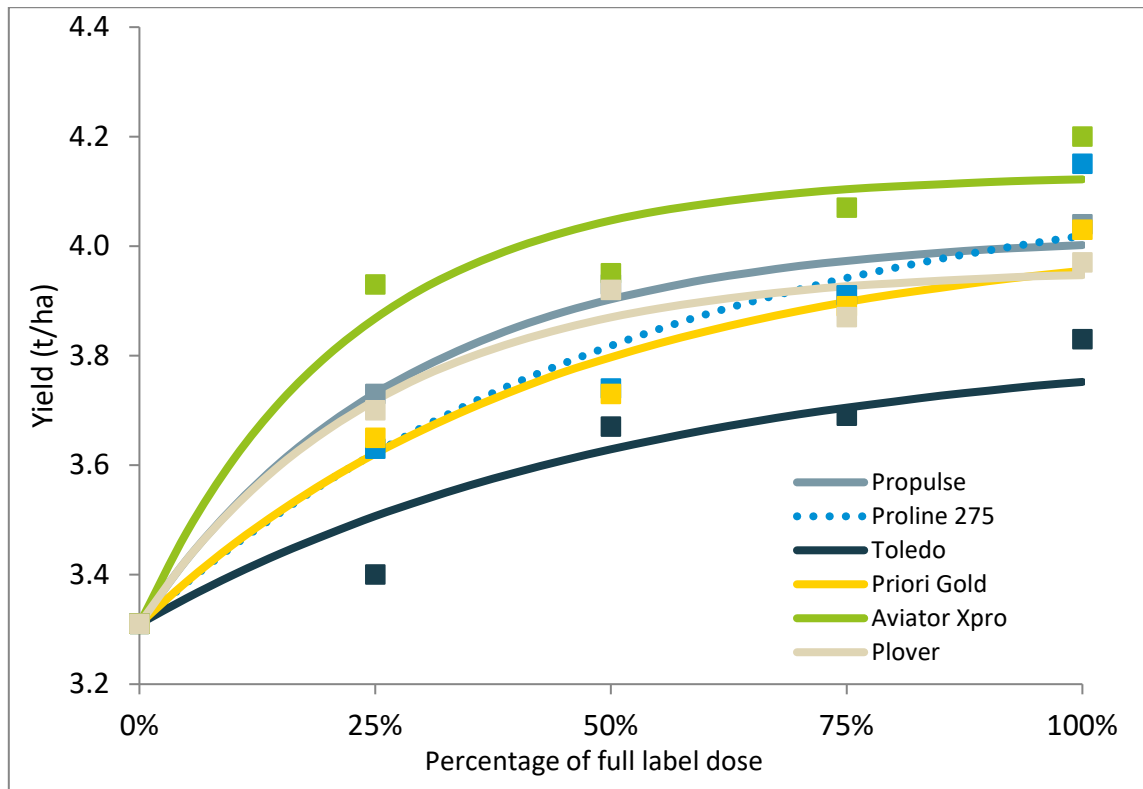
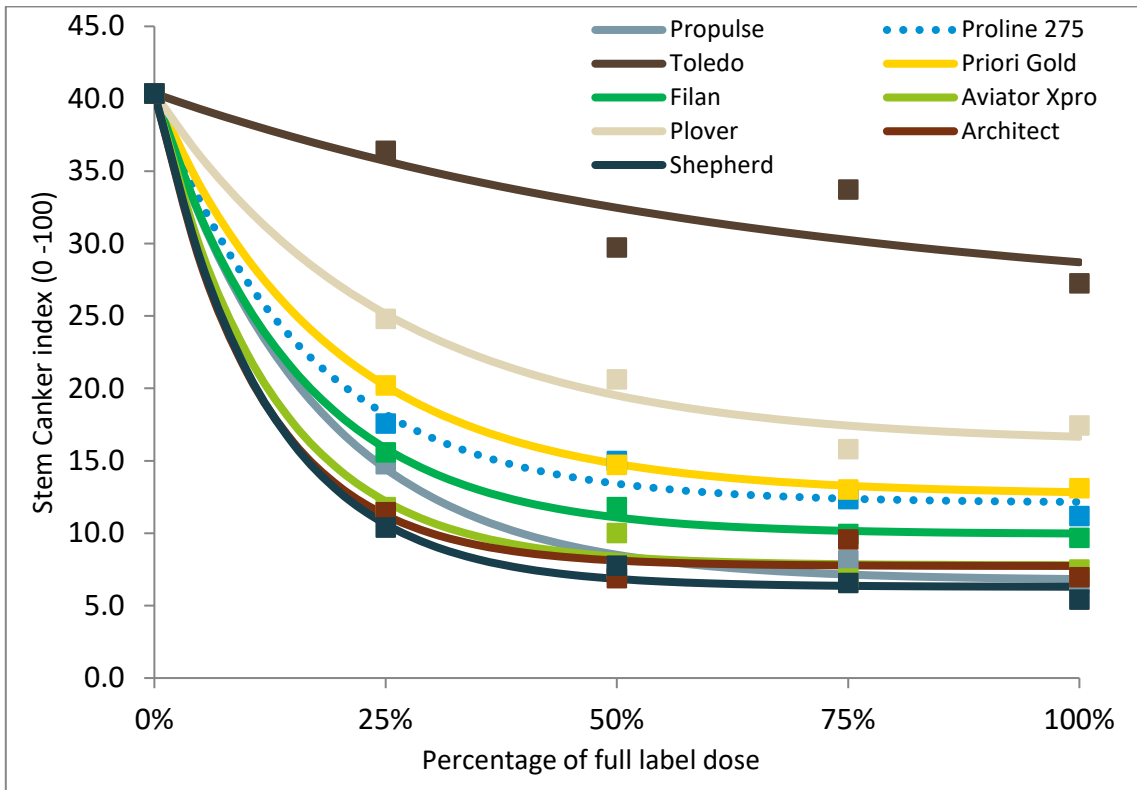


Figure 3. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Norfolk and Herefordshire in two trials conducted 2022/2023

a.



b.

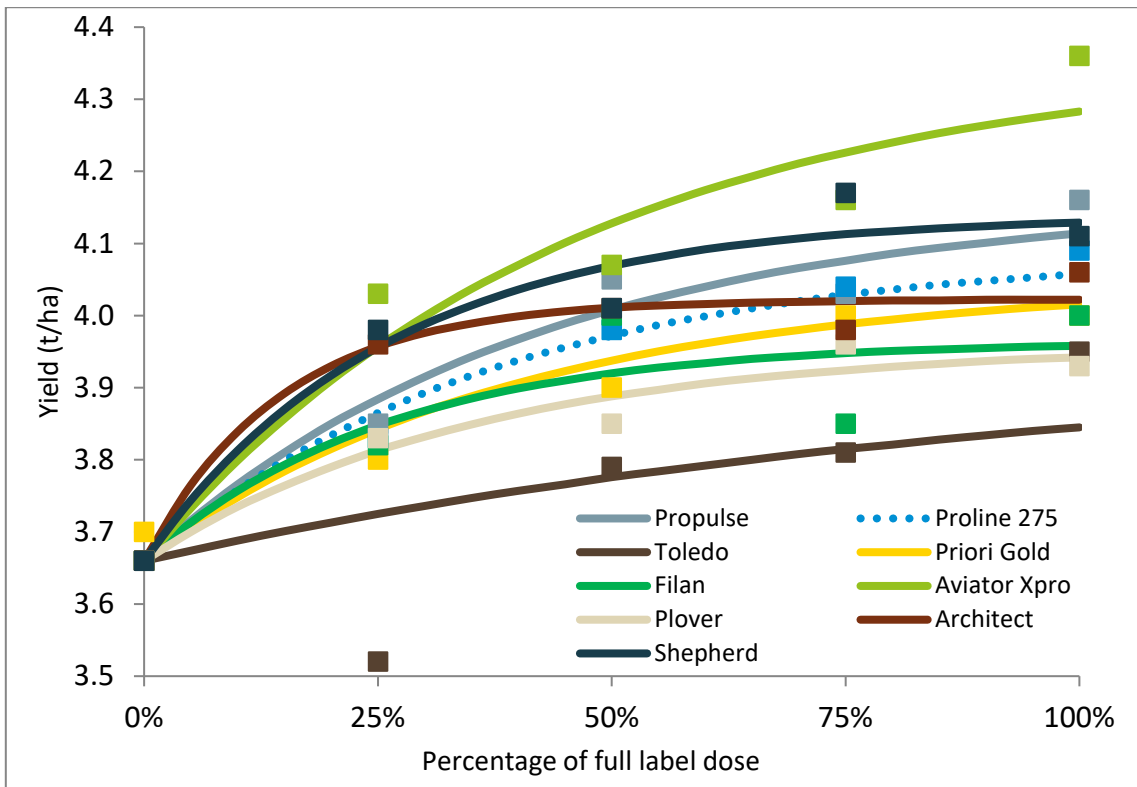


Figure 4. Phoma stem canker control (a.) and yield (b.) response, at 91% dry matter in relation to fungicide dose in Norfolk and Herefordshire in twelve trials conducted in 2015 to 2023

4. Key messages for 2024

Use the phoma forecast (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 in early to mid-October in 2023 (earlier than the previous two years). Many crops had already reached threshold when the first fungicides were applied, and on susceptible varieties second applications were applied when re-infection was seen at the end of November. Where phoma epidemics have occurred later and on very small plants, 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.

Fungicide application timing is important. The first application should be made on crops (RL rating 7 and below) when 10 to 20% of plants have phoma leaf spot. Plan a second application when re-infection is evident (4 to 10 weeks later). Some varieties with high resistance ratings for stem canker (RL rating 8 and above) may also show 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. This should be considered when planning autumn programmes. Although phoma is detected in some Scottish crops, local conditions mean it seldom develops to the damaging canker-forming stages (light leaf spot is the main target). In areas where phoma is noted in crops at threshold levels, both diseases may need to be considered when deciding on autumn application timings.

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 are now several modes of action available, including azole and non-azole options, for the control of phoma leaf spot/stem canker. The latest fungicide resistance management guidelines are available online: ahdb.org.uk/frag