



## Pasmo control in flax

CATEGORY [disease](#) | April 30, 2025

One fungicide application at mid-flowering was as effective as a dual fungicide application at early- and mid-flowering stages for disease control, quality parameters and yield increases. A dual mode-of-action foliar fungicide is recommended for fungicide insensitivity management.

Pasmo is a fungal disease, caused by the pathogen *Septoria linicola*, which can reduce the quality of flax seed, and under severe infestations, reduce seed yield by 60 to 70%. It is the most commonly observed flax disease on the Prairies, and is favoured by warm temperatures of 21C and rainfall and high humidity, particularly during the flowering stage of flax and thereafter. Commercially available flax varieties are all susceptible to pasmo, so the disease must be managed through effective fungicide application and diverse crop rotation.

The objective of this study was to evaluate fungicide application timing to control pasmo. A second objective was to determine the sensitivity of *S. linicola* isolates against pyraclostrobin (Group 21 strobilurin) and fluxapyroxad (Group 7 carboxamides) fungicide active ingredients.

Trial locations were at Vegreville, AB, Melfort and Saskatoon, SK, and Brandon, MB. The flax variety CDC Bethune was used in the experiment that was conducted under no-till seeding systems over three years from 2014 through 2016. Pasmo disease severity, seed yield, oil content, thousand seed weight (TSW) and test weight (TW) were measured.

Fungicides applied were pyraclostrobin (i.e. Headline EC), fluxapyroxad (Xemium) and pyraclostrobin + fluxapyroxad (Priaxor). Xemium has since been discontinued. Headline and Priaxor are currently registered on flax for control of pasmo.

A third product, Dyax, also a combination of pyraclostrobin + fluxapyroxad but at different active ingredient concentrations than Priaxor, has been registered on flax since this research was conducted.

Fungicide application timings were at early flower (BBCH 61), mid-flower (BBCH 65), and a dual application at both early and mid-flower, and were compared to a control without fungicide application. Fungicides were applied at label rates.

Urea-N fertilizer was side-banded at seeding to achieve 107 lbs N/ac (120 kg N/ha) of residual N + fertilizer N. Phosphate fertilizer was applied with the seed at rates of 18 to 24 lbs P<sub>2</sub>O<sub>5</sub>/ac (20 to 27 kg P<sub>2</sub>O<sub>5</sub>/ha). The seeding rate was 100 seeds/ft<sup>2</sup> (1000 seeds/m<sup>2</sup>) and the field plots were planted between May 25 and June 7. Herbicides were applied as needed.

To increase the risk of *S. linicola* infection, 1.78 to 2.67 lbs (2 to 3 kg) of pasmo-infected flax straw was spread on each plot when flax plants were approximately 8 inches (20 cm) tall. Disease severity was assessed at flax maturity.

### **Fungicides differed in pasmo control**

Data for 12 site years were broken into three groups. Seven site-years had significant reductions in pasmo disease severity plus an increase in yield at Brandon 2016, and Melfort and Saskatoon in 2014, 2015 and 2016. Three site-years at Brandon 2014 and 2015 and Vegreville 2016 had a significant reduction in disease but not an increase in yield, and disease was not observed at Vegreville 2014 and 2015. This analysis looks at the seven site-years where fungicide application provided benefits in disease control and yield increases.

Disease severity was 70% for the untreated control, and was reduced to 48% with Xemium application. Headline and Priaxor statistically had the lowest reductions to 23% and 18% disease severity.

At these seven site-years, fungicide application increased yield over the control, which yielded 30 bu/ac (1874 kg/ha). Xemium and Headline had statistically similar yields of 37 and 38 bu/ac (2,340 and 2,391 kg/ha) with an increased yield of 28% (Headline) and 25% (Xemium) compared to the

control. Priaxor had the statistically highest yield at 40.7 bu/ac (2,562 kg/ha) with a yield increase of 37% over the control.

Application of Priaxor also increased TSW, TW and oil content compared to Headline and Xemium.

Fungicide application at early and mid-flowering stage had statistically similar disease severities at 35 to 32%. Application at both stages had the statistically lowest disease severity at 22%.

Application timing also affected yield. Application at both flowering stages yielded 40 bu/ac (2,513 kg/ha) and was statistically higher than the early application at 37 bu/ac (2,340 kg/ha). However, there was no statistical yield difference between the mid-flower and dual applications.

Application at both flower stages resulted in the highest TSW, while applications at the mid-flower and both stages resulted in similar TW and oil content. The early timing had the lowest TSW, TW and oil content.

Overall, the researchers concluded that a single fungicide application at mid-flowering stage was as effective as a dual fungicide application at both flowering stages.

#### **Fungicide insensitivity was not detected**

In this study, 73 isolates of *S. linicola* were tested against pyraclostrobin and fluxapyroxad fungicides. Fungicide insensitivity was not detected in any of the isolates.

However, continuous use of the same fungicide active ingredient may result in the development of fungicide insensitivity in the pathogen population. Most fungicides are single-site inhibitors and insensitivity development can occur through changes in the pathogen population. While Headline and Priaxor both provided similar benefits in disease control, quality parameters and yield increases, Priaxor would be the preferred product for *S. linicola* control because of its dual modes of actions.

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Islam T, Vera C, Slaski J, Mohr R, Rashid KY, Booker H, Kutcher HR. Fungicide Management of Pasm Disease of Flax and Sensitivity of *Septoria linicola* to Pyraclostrobin and Fluxapyroxad. *Plant Dis.* 2021 Jun;105(6):1677-1684. doi: 10.1094/PDIS-06-20-1175-RE. Epub 2021 May 5. OPEN ACCESS: <https://doi.org/10.1094/PDIS-06-20-1175-RE>

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