

Pasmo: Paper Tiger or Dark Horse? August 2009

Incidences of pasmo on the Canadian prairies, particularly in Manitoba and eastern Saskatchewan are widespread, but how serious is the threat?

Pasmo is a flax disease caused by the fungus *Septoria linicola*. Its growth is encouraged by warm and moist conditions that usually occur in the late summer and fall however it can also take hold earlier on if conditions are favorable. Owing to its proclivity for moisture, pasmo is more commonly found in the damper Manitoba climate than in the drier production areas of Saskatchewan and Alberta.

Pasmo is a seed borne pathogen that overwinters in flax residue and spreads by wind or rain. The infection begins on the leaves and is expressed as circular brown spots that eventually move to the stem and change into alternating black and brown bands as it becomes more entrenched along the stem of the plant. So far, pasmo infection has been shown to be most injurious during the reproductive stages of the crop, namely during post-bloom seed set and fillⁱ, which is why fungicide applications close to or during flowering has been recommended.

Left unchecked, pasmo has the potential to cause significant reductions in yield. One study reported that the disease can lead to an overwhelming 70% yield lossⁱⁱ, however others indicate a less serious threat. A MAFRI information sheet states that pasmo 'seldom causes serious damage'ⁱⁱⁱ. This is consistent with results from a study conducted by the Langdon Research Extension Center in North Dakota that showed pasmo had no effect on yield^{iv}. Although pervasive, pasmo severity in MB and SK flax so far appears to be less of a concern. In 2007, pasmo was found to be the most prevalent disease in flax, more than fusarium wilt and powdery mildew. It was observed in 90% of all crops surveyed – yet severity was >30% in only 12% of the crops^v.

The disease can also have a significant impact on oil quality. In an oft-cited paper among flax workers, severe pasmo infection can not only lower the percentage of oil in the seed, but can also have a significant negative impact on iodine number^{vi} – a quality measurement of how well the oil dries, which is used extensively by industrial processors of paints, linoleum etc. As end use markets for flax develop and processors become more discriminating, producer concern over pasmo should grow.

Despite some studies that indicate potential for significant harm, up to this point, pasmo has not generally been treated as a serious threat. In the event that it does become significant, there has been research into chemical control measures and breeding attempts to introduce

resistance. Efficacy results for various fungicides have been mixed, work on economic thresholds for the disease appears to be underdeveloped, and resistant varieties are still not commercially available. Until further work is done in these areas, cultural methods such as early seeding to avoid higher moisture conditions in the fall, crop rotations of at least three years, and the use of disease-free certified seed will remain the most effective and widely recommended forms of pasmo containment.

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ENDNOTES:

ⁱ Ferguson, M.W., Lay, C.L., and Evenson, P.D. 1987. Effect of pasmo disease on flower production and yield components of flax. *Phytopathology* 77:805-808. p.807

ⁱⁱ Rashid, K.Y. 2001. PasmO disease in flax: impact on yield and potential control methods. (Abstr.) *Canadian Journal of Plant Pathology*. 23:204

ⁱⁱⁱ Manitoba Agriculture, Food and Rural Initiatives (MAFRI). PasmO. Accessed at: <http://www.gov.mb.ca/agriculture/crops/diseases/fac19s00.html> on 02/06/2009

^{iv} Halley, S. 2002. Flax Response to Fungicide Application for the Control of PasmO Disease. Langdon Research Extension Center – North Dakota State University. Accessed at: <http://www.ag.ndsu.edu/langdon/02data/flax%20fungicide2a.htm>

^v Rashid, K.Y., Desjardins M.L., and Duguid S. 2008. Diseases of flax in Manitoba and eastern Saskatchewan in 2007. *Canadian Plant Disease Survey*. p.111

^{vi} Sackston, W.E. 1951. Effect of pasmo disease on yield and quality of linseed oil. *Canadian Journal of Botany*. 29:339-351. p. 348