

Fire and Iron: Tools for crop disease management?

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Summary

Large volumes of crop residue are often managed using tillage or burning. This study examined the effect of these practices on diseases of barley (leaf spot, *Pyrenophora teres* Drechsler and *Cochliobolus sativus* (Ito & Kuribayashi)) and canola (blackleg, *Leptosphaeria maculans* (Desmaz.) Ces. & De Not.; sclerotinia stem rot, *Sclerotinia sclerotiorum* (Lib.) de Bary). The trials were conducted at Birch Hills and Star City, SK for 5 years with treatments of: zero (ZT) and conventional (CT) tillage, and burning (B) or not burning (NB) previous crop residue. At each site an experiment for barley and for canola was established and a 2-year rotation followed between these crops. Leaf spot severity on barley was slightly lower under ZT than CT in 3 of 6 station years (SY), and higher under the B treatment than NB in 1 SY, but no significant treatment difference was detected at the other SYs. ZT resulted in a higher yield than CT in 6 of 9 SYs, but there was little relationship between leaf spot severity and barley yield. Yield was higher in the NB than the B treatment in only 1 SY. In 2 SYs, yield was higher for the ZT-B treatment than the other treatment combinations. In canola, moderate sclerotinia stem rot incidence occurred in only 1 SY, and blackleg incidence did not show a consistent pattern with treatment. Canola yield was higher under ZT than CT in 3 SYs, but B had no consistent impact. We conclude that use of fire to manage diseases of barley and canola was not effective. ZT sometimes reduced the severity of leaf spot on barley and blackleg on canola, but the results were not consistent and the magnitude of the reduction in disease was small. Crop yields were impacted more by tillage system than residue burning.