

## **Impact of Tillage System, Rotation and Fungicide Application on Seed Yield and Protein Content of Wheat and Field Pea**

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The impact of tillage system, increasing broadleaf crop rotation frequency and foliar fungicide use on diseases, seed yield and protein content of wheat and field pea were determined in the second cycle of three 4-year rotations at Melfort from 1998 to 2001. A 4-replicate split-split plot design was used with three tillage systems (zero tillage (ZT), minimum tillage (MT) and conventional tillage (CT)) as main-plots, three rotations (1. barley-canola-wheat-barley; 2. barley-pea-wheat-canola; and 3. canola-pea-flax-barley) as sub-plots and foliar fungicide treatments (treated or untreated) as sub-sub plots. Tillage system had little impact on diseases in either wheat or field pea. In the drought year of 2001, seed yield of wheat or field pea was greater under ZT or MT than under CT. Protein content of wheat was often greater under ZT than under MT and/or CT. Rotation was not a major factor in disease severity of either wheat or field pea. Rotation had an effect on seed yield of field pea only in 2001. For wheat, protein content in seed was greater in 3 of the 4 years (1998, 1999 and 2001) when it followed field pea than when it was grown after canola. Foliar fungicide application had the greatest impact on disease control and seed yields, although benefits varied from year to year. Fungicides increased field pea yield by 32 and 16% in 1998 and 2000, respectively and wheat yield by 19, 13 and 9% in 1998, 1999 and 2000, respectively. For wheat, protein content in seed decreased with fungicide application, but the effect was significant only in 1998. For field pea, protein content in seed decreased with fungicide application in 1998 and 2000, most likely due to a dilution effect from increased seed production. In summary, foliar fungicides had the greatest impact of the factors examined to reduce plant disease symptoms and increase seed yield of either crop, however the magnitude of the yield increase varied among crop years depending on environmental conditions.