On-Farm Evaluation of Foliar Fungicide Applications in Field Peas

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Introduction

- Over the last five years (2018-2022), pea acres in Manitoba have doubled from the previous five-year period (2013-2017) to roughly 154,000 acres annually.

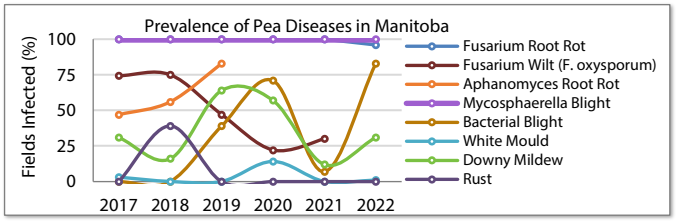

Figure 1. Prevalence (% of fields infected) of pea diseases in Manitoba (2017-2022). Source: Kim, Y.M. et al., 2022.

- Mycosphaerella (Ascochyta) blight infects the majority of pea crops each year. The severity of disease depends on how early it infects the crop and if conditions are conducive for its development (warm and humid).
- Mycosphaerella blight is the main target of foliar fungicide applications.

Objective

- Investigate the agronomic and economic implications of foliar fungicide applications in field peas.

Materials and Methods

- Forty-four On-Farm Network (OFN) trials were established from 2017 to 2022 on farmers' fields across Manitoba using the farmers' existing equipment and typical management practices.
- Field-scale strip plots were randomized and replicated three to four times. Trials compared a combination of either 1) no fungicide, 2) one application of fungicide at early flower or 3) two applications of fungicide (10-14 day after the first).
  - 25 trials have compared single vs. no application
  - 16 trials have compared single vs. double application
- Since 2019, disease ratings for Mycosphaerella blight and white mould have been collected 8-10 days after application.
- Strips were harvested separately, weighed using a weigh wagon and yields were corrected for moisture.

Results

Single vs. No Application

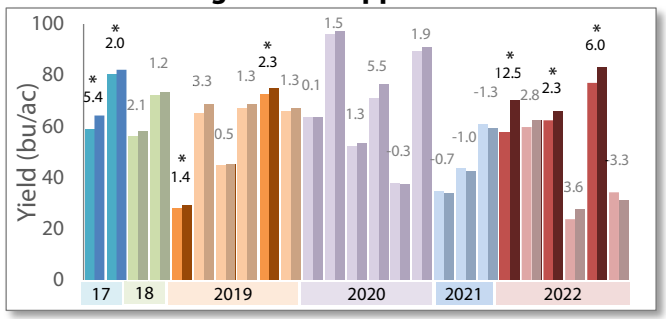

Figure 2. Yield difference (indicated by the value above the paired bars) between peas with a single application of fungicide vs. none from individual OFN trials from 2017-2022. *Statistically significant yield difference at $p < 0.05$.

- Among 25 trials comparing a single application of fungicide at early flower versus untreated strips, there have been seven statistically significant yield responses.
- A single application increased pea yield 28% of the time over no application, improving yield by 4.6 bu/ac on average (range: 1.4 to 12.5 bu/ac).
- Assuming a product cost of $21.25 and a pea sell prices of $10/bu, four of the seven significant trials were economical, providing an average return on investment of $44.37/ac (range: $1.75-104.08/ac).

Single vs. Double Application

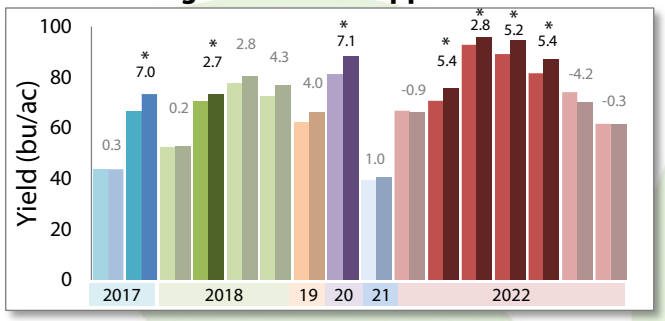

Figure 3. Yield difference (indicated by the value above the paired bars) between peas with a single application of fungicide vs. a double application from individual OFN trials from 2017-2022. *Statistically significant yield difference at $p < 0.05$.

- Among 16 OFN trials comparing two fungicide applications to a single pass, there have been six statistically significant yield responses.
- Two applications increased pea yield 44% of the time, improving yield by 5.1 bu/ac on average (range: 2.7-7.1 bu/ac).
- All six yield responses were economical, providing an average return on investment of $29.66/ac (range: $5.75-50.15/ac).
- Of 2019-2022 significant trials, large yield differences had a reduction in white mould incidence in addition to less Mycosphaerella blight in both trial types.

Summary

- A single application of fungicide at early flower significantly increased pea yields 28% of the time. A second application of fungicide improved pea yield over a single application alone 44% of the time.
- During the dry years of 2019, 2020 and 2021, it was more common for farmers to question if a fungicide application was necessary at all due to dry growing conditions and low risk of disease development. As a result, fungicide application paid less frequently.
- In wetter growing conditions that were conducive to disease development, it was more common to question if a second application was necessary to manage disease. When a second application has protected yield, it has consistently provided a return on investment in OFN trials (all yield responses were economical).
- To determine if a fungicide application is likely to be beneficial, consult MPSG's *Fungicide Decision Worksheet for Managing Mycosphaerella Blight in Field Peas*. For more information on each of the individual OFN pea fungicide trials and results, visit manitobapulse.ca/on-farm-research-reports.

Acknowledgements

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