

FLEABEETLE HERBIVORY IN CANOLA IMPACTED BY SEED SIZE, SEEDING DATE, AND SEEDING RATE RESULTS - 2020

Background: To combat the effects of flea beetle damage, the Canola Council of Canada advises that canola be sown at higher seeding densities, larger seed size, and later in the season. Research has shown the benefits of each practice independently, but there exists limited literature on how all these recommendations, acting in conjunction, affect canola production. Through this experiment, by assessing interaction effects we may be capable of measuring the true flea beetle response to these recommendations and provide new recommendations based on these possible interactions. 2020 was the first year of this three-year study, and canola growth was greatly limited at NPARA due to weather-induced stress. Through the years to come, however, the accumulation of data across multiple sites will provide for a robust assessment of these cultural practices.

The experiment was carried out at three sites across northern Alberta: NPARA, Mackenzie Applied Research Association, and Smoky Applied Research and Demonstration Association, and set up as a four-replicate, split plot analysis. The objective of the flea beetle canola trial was to evaluate the impact of the following on flea beetle leaf damage and flea beetle population:

- i.) Seeding Date (late-April to early-May, or a three-day soil temperature average of 5C, and second to third week of May, or 10C average soil temperature)
- ii.) Seed Size (small 1.4-1.7mm, large 1.8-2.2 mm, and mixed)
- iii.) Seeding Rate (5 plants/sq. ft., the recommended 10 plants/sq. ft., and 16 plants/sq. ft.)

Along with total flea beetle counts, counts of each particular species was recorded. Other dependent factors assessed include percent damage of seedlings up to two leaf stage, percent of planted canola to reach maturity, and harvest yield.

Seeding Date: May 12 (Early)
May 18 (Late)

Seeding Depth: 0.5-1 in.

Seeding Rate: variable/sq. ft.

Harvest Date: Oct. 15

Applications:

May 13: Glyphosate - 0.66 L/ac
Heat - 0.059 L/ac

Merge - 0.2 L/ac

May 15: Glyphosate - 0.66 L/ac

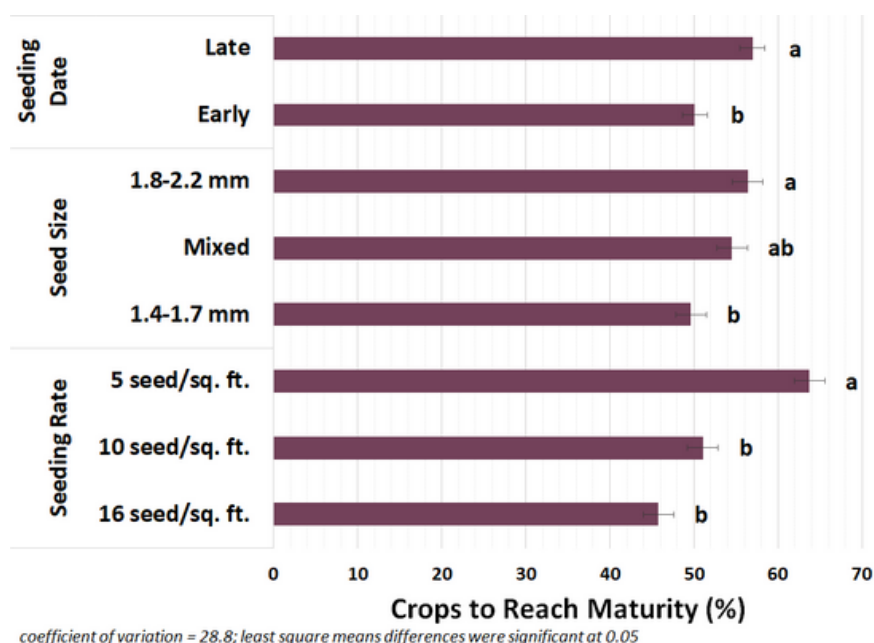
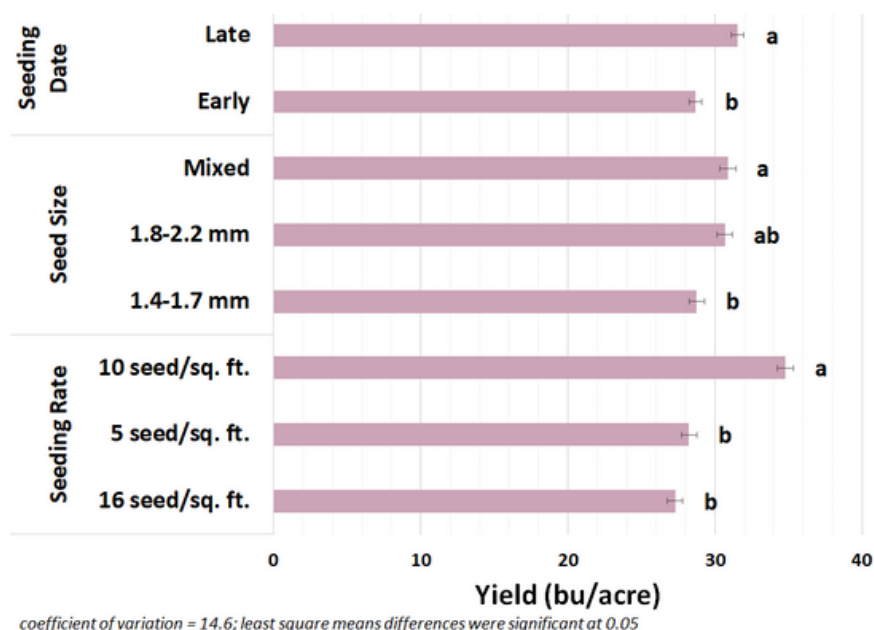
June 24: Glyphosate - 0.66 L/ac



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Overview: At NPARA, the canola crop (SY4135) in this trial was heavily impacted by high moisture soil conditions. However, flea beetle counts were still carried out in the spring and the inclusion of the other two sites allowed for an analysis.

Conclusion: Late-seeded canola had a significantly higher yield than early-seeded ($P < 0.0001$). Mixed and large seed size out-yielded the smaller seed size ($P = 0.001$), and the recommended seeding rate, 10 seed/sq. ft., yielded greater than 50% and 150% seeding rates ($P < 0.0001$). A greater percentage of canola reached maturity when planted on the later date as opposed to the early ($P = 0.0012$). C.V. values were high for both variables assessed.



Fleabeetle Monitoring: Fleabeetle counts and leaf damage percentage rates were monitored up to the true three-leaf stage. On each canola plot, three sticky insect traps were placed to capture fleabeetles. Three times per week, NPARA staff made field observations on the total fleabeetle counts from these traps and rated fleabeetle-induced damage from 0%-100%. After each week, new traps were set out and the old were taken back to the office for a further analysis. By use of magnifying instruments, fleabeetle counts were tallied on a per-species basis. This year, the species observed were: *P. crucifera* (crucifer), *P. striolata* (striped), and *P. punctulata* (hop flea beetle). These measurements will be carried out again in 2021 and 2022, and the repeated results will be presented.