EASTERN CANADA
OILSEEDS DEVELOPMENT ALLIANCE

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Activity 19 Factsheet
Winter Canola Rates/Dates Trial

Objectives

The objectives of this activity are to:

1. Test varieties/genotypes at sites across Eastern Canada and identify combination of varieties and optimum fertilization for specific locations.
2. Assess the suitability of winter-seeded spring-type canola for eastern Ontario.
3. Investigate winter survival and the yield potential of winter canola.

Methodology

Winter canola can significantly out-yield spring canola. It has other advantages, such as improved distribution of the workload over the cropping season, better competition with spring germinating weeds, reduced herbicide costs compared to spring-seeded crops, and reduced risk of herbicide resistance. The main goal of this activity is to determine if winter canola could be grown successfully in Eastern Canada.

The winter canola experiments involved the combinations of 3 seeding dates (in 2015, for example, early (Aug. 27), mid (Sept.13) and late (Sept.26)) and 3 seeding rates (2.5, 5.0, and 7.5 kg ha^{-1}) with 3 varieties (Bonanza, Sitro and Sensation) and another variety (Baldur) with only one seeding rate (5.0 kg ha^{-1}) but the same 3 seeding dates. Soil preparation was conducted using conventional tillage. Fertilizer was broadcast onto the experimental site at the rate of 50 kg ha^{-1} of N as urea (46-0-0), 20 kg ha^{-1} sulphur as ammonium sulphate (21-0-0 with 24% S), boron as Granubor (10% boron) at 2 kg ha^{-1}, 20 kg P (0-46-0), and 40 kg K ha^{-1} (0-0-60) prior to seeding. An additional 50 kg ha^{-1} of N as urea (46-0-0) was applied after the winter. The experiments were organized following a randomized completely block design with four blocks for each experiment and the plot size was 5 x 2.6 m. Experiments were conducted at Ottawa, ON, Montreal, QC, Saint-Mathieu-de-Beloeil, QC, Canning, NS, and Charlottetown, PE.

Data was collected and recorded, according to established protocols, on the following variables for canola: plant emergence (number of seedlings per m of row); stand count after winter, yield components (10 plants per plot); branches per plant; pods per plant; seeds per pod; and seed yield (at 10% moisture). All the canola plots were regularly observed for the presence of insects and diseases. Data were subjected to statistical analyses based on an appropriate statistical model (after negative binomial or log normal transformations of the data) by low BIC (Bayesian Information Criteria) using the SAS PROC GLIMMIX (9.3) to detect differences among the treatments. Means were compared using the LSD test ($P < 0.05$ and $P < 0.1$).

Results

- All three plantings of winter canola in PEI and Saint-Mathieu-de-Beloeil, QC did not survive the winters of either year but Canning, NS survived in 2013 and not survived in 2014.
- In Ottawa, only 2 plantings survived in both years: the early planting and the normal planting.

- In Montreal 2013, all planting survived but in 2014 only 2 plantings: the early planting and the normal planting (Aug 27 and Sep 13).
- In Ottawa, both years, the winter canola yields were not better than spring canola yields in the same area. The normal September planting yields were better than the yields of the first plantings, but not as good as the average spring canola yields in the same location, which averaged around 3100 kg ha^{-1} in 2014 and 3400 kg ha^{-1} in 2015 at the Ottawa site.
- The results showed that winter canola generally had lower germination rate and lower stand counts after emergence, than spring canola at the same seeding rate, indicating a higher seeding rate may be needed. However, winter canola has a longer growing season than spring canola.
- While the early and mid-planted crops grew well in early November, before the onset of winter conditions, the late planted crop appeared to be small and may have not accumulated sufficient non-structural carbohydrates for overwintering.
- In Montreal, the spring canola yield was higher than that of winter canola.
- In 2013, the yield was significantly influenced by the seeding rates and dates and cultivars. The yield increased with increased seeding rates from 2.5 to 7.5 kg ha^{-1} for cultivar Sitro.
- Among the cultivars and seeding rates, the highest yield was occurred for Sitro planted Mid (Sept. 5) at the rate of 7.5 kg ha^{-1} followed by Visby planted in Mid (Sept.5) at the rate of 5 kg ha^{-1}.
- In 2014, the early and normal planting yields of cultivar Baldur (3463 and 3485 kg ha^{-1}, respectively) yields were better than other cultivars with early and normal seeding, but the spring canola average yield was 4207 kg ha^{-1}.
- The results showed that, there were significant differences in emergence (number of plants m^{-1}) due to treatments. Specifically, the highest emergence occurred for cultivar Sitro planted early (Aug. 27) at 7.5 kg ha^{-1} (169). The lowest emergence was observed in all varieties for the middle planting date (Sept. 13) and planting at the rate of 2.5 kg ha^{-1}.
- There were no significant differences in winter survival, stand count at maturity, number of branches, pods and number of seed pod^{-1} due to seeding date, rate and cultivars.
- There was no significant difference in yield due to seeding date, rate and cultivars, but the highest yield was obtained for cultivar Baldur planted at the early and mid-dates at the rate of 5 kg ha^{-1} (3463 and 3485 kg ha^{-1}, respectively).
- Overall, the spring canola yield was better than that of winter canola at both sites (Ottawa and Montreal).
- Locations, varieties, seeding date and rate influenced winter canola yield. However, it does not appear that current winter canola types are well suited to production in much of Eastern Canada.

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