

PROJECT TITLE: Determine Canola Optimum Seeding Date and Rate in Central Montana

EXPERIMENT NO:

PROJECT LEADERS: Chengci Chen, Cropping Systems Agronomist

PROJECT PERSONNEL: Chengci Chen, Cropping System Agronomist
Karnes Neill, Research Associate
Dave Wichman, Superintendent and Agronomist

OBJECTIVES: 1) investigate seeding date and plant density effects on canola yield in central Montana;
2) compare different Roundup-Ready canola varieties for their adaptation to the environments in central Montana.

METHODS: This study was conducted at the Central Agricultural Research Center of MSU, near Moccasin. Three Roundup-Ready Canola varieties, Hyola 357 (from Interstate Seed Company, West Fargo, ND), DK 223 and DK 3455 (from Monsanto Company, St. Louis, MO), were direct-seeded into winter wheat stubbles on three seeding dates (16 April, 14 May, and 3 June) using both hoe and disk type no-till plot drills. All canola varieties were seeded at 12 plants/ft² with 12-inch row spacing. After two true leaves appeared, the experiment plots were thinned to 4 plant densities (1, 3, 6, and 9 plants/ft²) with 4 replications. At the same time 60 lbs N/A plus 20 lbs P₂O₅/A was applied using broadcast method. Roundup was applied for weed control as needed. Canola seed was harvested by direct combining using a plot combine.

RESULTS: There was no difference between drill types in canola emergence. Both drill types had over 90% emergence rate. DK 3455 at the second seeding date and all three varieties at the third seeding date were damaged by hail before harvesting. Therefore, only yields of DK 223 and Hyola 357 from the first two seeding dates are reported here.

Results in Fig 1 show that canola seed yield decreased with planting date delayed beyond April 16, and seed yield increased when plant density increased from 1 to 3 plants/ft², then yield declined with increased plant densities.

DK 223 out yielded Hyola 357. DK 223 yielded over 800 lb/a when it was seeded on April 16 with optimum plant population of 3 plants/ft². The optimum plant density of 3 plants/ft² is lower than that in Oregon and Washington (Wysocki personal communication) indicating low available soil water to support higher population.

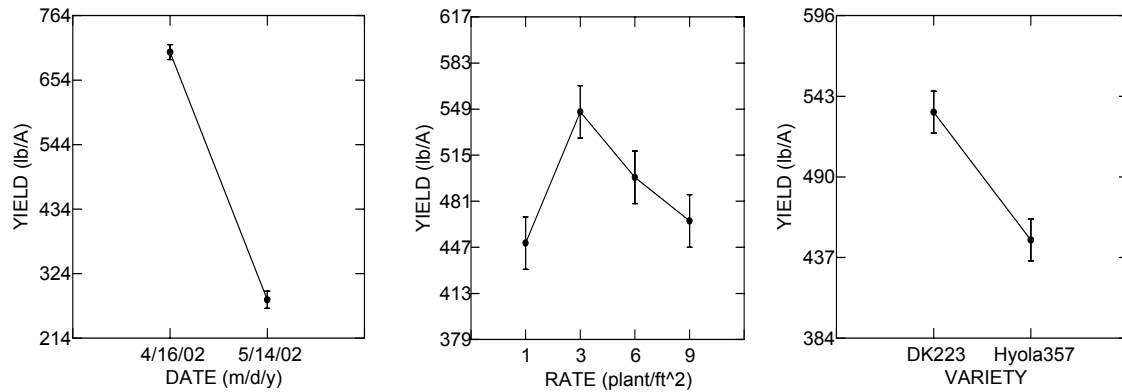


Fig. 1. Canola seed yield influenced by planting date, plant density, and variety in central Montana.



Fig. 2. Pictures from 2002 planting date and plant density trial show more severe water stress in the late-planted plots (right) than in early-planted plots (left).

Although there was no yield data for the third seeding date due to the hail damage. The pictures in Fig.2 show more severe water stress for the third seeding date in the summer. We expected little seeds were produced even without hail damage.

Although the earlier the canola was planted the higher of yield received, considering the wet soil conditions and equipment accessibility to the field in the early spring, mid-April is considered the optimum seeding date in the region. The optimum seeding rate is 3 plants/ft². The DK 223 is recommended a suitable variety for the region. However, due to the highly spatial and temporal variations of climate and soil in central Montana, and unpredictable weather from year to year, this study needs to be repeated to confirm the results.

FUTURE PLANS: This trial will be repeated in the spring of 2003 to confirm the results. Since early seeding received higher yield than late seeding, winter type canola varieties will be evaluated in the future to test the feasibility of fall seeding in this central Montana.

ACKNOWLEDGEMENT: The authors wish to thank Douglas Ryerson at Monsanto for providing the DK 223 and DK 3455 Roundup-Ready canola seeds, and Jim Johnson at Interstate Seed Company for providing Hyola 357 Roundup Ready canola seed for this study. Funding for this study came from Montana State Experiment Station.