

2008 North Dakota and Minnesota Canola Agronomic Survey

Shanna Mazurek, Tammy Duchsherer, Danielle Hoff, and Dr. Brian Jenks

Background/Introduction

In November 2007, the U.S. Canola Association Board of Directors formed the Canola Acreage Task Force to help increase canola acres across the United States. Each region implemented different strategies during the 2008 growing season to help achieve this goal.

The Northern Canola Growers Association, Minnesota Canola Council, and North Dakota State University designed and conducted an in-depth survey looking at all aspects of canola production. Data is still being analyzed, so the information here is only preliminary. Information from this survey will be used to assess the impact of different management strategies and environmental conditions on canola production in ND and MN.

A total of 45 fields in 11 counties representing the major canola growing regions of North Dakota and Minnesota were monitored during the 2008 growing season from emergence to harvest (Figure 1). One field for every 25,000 acres of canola was chosen. Fields were selected based on the producer's willingness to participate and provide information on each field. For most surveys, fields are chosen at random with no insight to that particular field's history. One very unique aspect of this survey was grower participation. For each field monitored, a five-year rotational and chemical history, along with seeding information, fertilizer timing and rates, canola variety chosen, soil test results, and yield data were obtained from each producer.

Many data points were collected in the field throughout the growing season. Tammy Duchsherer was hired by NDSU-NCREC to scout each field. Tammy visited each field seven times. Each visit began in Minot, North Dakota and encompassed 2,000 miles across the central and northeastern parts of ND and northwestern MN. Visits were based on critical stages in crop development. For three of the visits, Danielle Hoff assisted with sample collection and disease evaluations. Crop stage, plant vigor/health, soil moisture, and weed control were monitored during each visit. Additional data such as stand establishment (pl/sq.ft), amount of damage caused by canola insect pests, and evaluations for economically important diseases were completed at appropriate stages in crop development. Weather conditions for each field during the growing season were obtained from the closest weather station in the North Dakota Agricultural Weather Network (NDAWN). Each field has a total of 30 data points along with weather data from NDAWN.

Results

Plant Growth:

Planting dates ranged from April 26th to May 30th. Twenty out of 45 fields were planted from May 10th to May 20th. Stand establishment was consistent across the region with 9-13 plants/sq. ft. On May 27th, all counties experienced a significant frost (27°F). Since stand counts were taken after the frost occurred, we concluded that even though the frost was severe and lasted for five hours in Bottineau County ND, overall stands were not affected. However, three fields were reseeded on May 30th. The reason for reseeding was not due entirely to the frost, but from a combination of frost, high winds, and flea beetle damage.

During ripening, a "purpling" of the stems and pods was observed in some fields in ND and MN. The purpling is termed "Sun Scorch or Sun Scald" and is abiotic damage caused by periods of high heat when the plants are ripening. The purpling is likely due to higher levels of anthocyanin pigment and lack of chlorophyll in the naturally senescing tissue. It appears to be a varietal response and was observed in the following varieties; Invigor 5630, Invigor 5550, and Nexera 845 CL.

Seventeen of the 45 fields followed a canola once every-five-years-rotation schedule. The other three rotations were canola every other year, canola every three years, and canola every four years.

The most popular varieties grown this season were Invigor 5440, Invigor 5550, Invigor 5630, and Nexera 845 CL.

Diseases:

Evaluations of incidence and severity were conducted for blackleg and Sclerotinia. Aster yellows and Alternaria pod spot were also monitored. Samples for each blackleg and Sclerotinia evaluation were collected in ten locations in each field and GPS coordinates were determined at each sample location. Incidence was determined by number of infected plants out of 100 inspected and severity was rated on a standard 0-5 scale.

The first evaluation for blackleg incidence was completed in the vegetative stage (prior to bolting). Incidence was below ten percent in all counties, except Cavalier county ND where it was 30%.

During flowering, petals were collected from each field in two locations to determine presence of Sclerotinia ascospores using Steadman's Semi-selective media. Ascospore presence was found in all counties except Roseau county MN, and McLean, Renville, Towner, and Ward counties in ND.

The final disease evaluation was completed after the canola was swathed. Incidence and severity for blackleg and Sclerotinia were determined. Bottineau county ND had the lowest incidence and severity for both diseases. Cavalier county ND had the highest incidence in both blackleg and Sclerotinia; 31% and 33%, respectively. Roseau county MN had highest severity in Sclerotinia (1.5) and Kittson county MN had highest blackleg severity (1.7). Overall, incidence and severity in both blackleg and Sclerotinia were low this year at the vegetative stage, flowering, and in the swath.

Disease data were plotted against crop rotation to see possible correlations (Figures 2 and 3). Generally, the more frequently canola was grown in the rotation, the higher the disease incidence and severity. Alternaria Pod Spot was observed on swathed canola in all counties. Aster yellows was observed in three fields.

Insects:

The Crucifer flea beetle was a problem for some areas this year. In parts of ND, especially the central and north-central counties, emergence was delayed due to cold, dry soils, and in some places seed remained in the ground for 20 days. Once the seed emerged, the seed treatment had worn off and the crop was susceptible to flea beetles. Seven growers in ND and MN applied a foliar insecticide.

Fields in Bottineau county ND had problems grasshoppers during ripening. One grower applied insecticide to the field edges twice for control. Cutworms were present early on in many fields, but were never above threshold levels. Many other insects were observed below threshold levels; bertha armyworm, diamondback moth, blister beetles, and aphids.

Yield:

Overall this was a good year for canola. Most producers were pleasantly surprised with how the crop did. Yields ranged from 820 lb/A in McLean county ND to 2,700 lb/A in Towner county ND. The average yield was 1,900 lb/A for all surveyed fields. Not all of the canola has been taken to the elevator yet so all green counts and tests weights are not known. Reported green counts were low (average 0.5) and test weight was consistently between 50-52 lbs.

Figure 4 shows yield data (lb/A) plotted against rotation. Highest yields came from fields in a canola once-every-three-year rotation and lowest yields were from a canola once-every-five-year rotation. This trend is likely a result of the once-every-five-year fields being located in the western region where yield potential is lower.

Weather:

Weather data is still being analyzed. However, one of the biggest challenges to canola production in 2008 was the cold, dry conditions early in the season that resulted in very uneven emergence and uneven ripening.

For additional information regarding the survey please contact Shanna Mazurek (shanna.mazurek@ndsu.edu) or Brian Jenks (brian.jenks@ndsu.edu).

Fig. 1 Counties Involved

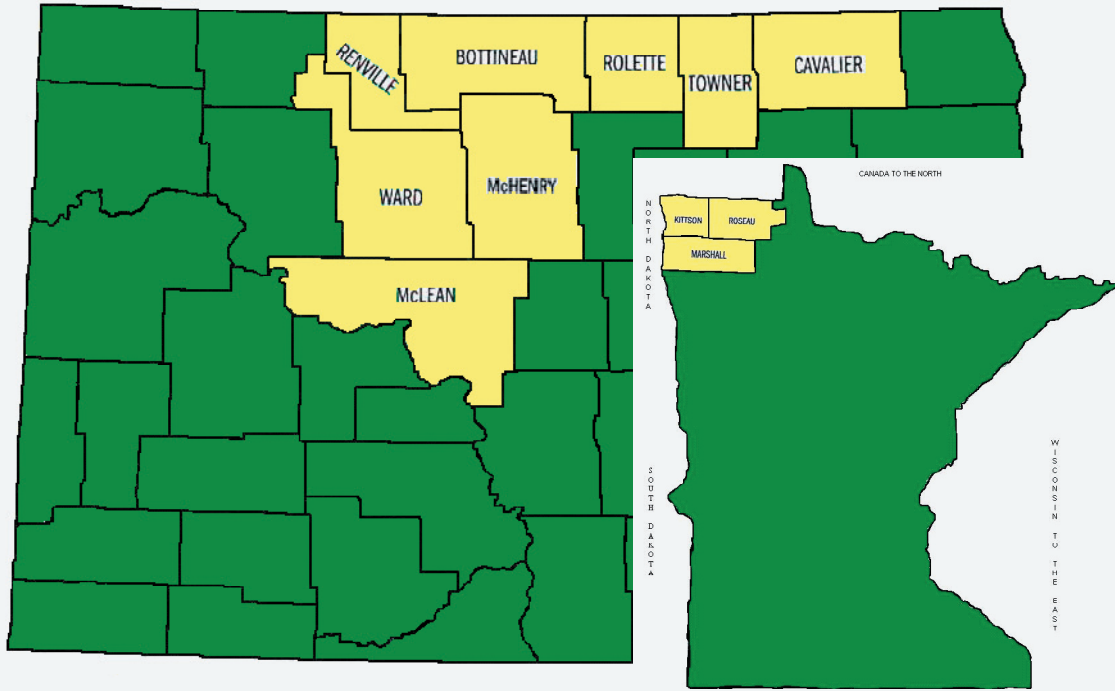


Fig. 2 Sclerotinia Incidence vs. Rotation

