2008 Canola Disease and Insect Survey for North Dakota and Minnesota

PI: Janet J. Knodel, Extension Entomologist, North Dakota State University

Cooperators: Sam Markell, Plant Pathologist, NDSU, Fargo
Luis del Rio, Plant Pathologist, NDSU, Fargo
Paul Porter, Assoc. Professor, Dept. of Agronomy, Univ. MN, St. Paul, MN
Derek Crompton, Local Extension Educator, Univ. MN, Roseau, MN
Greg Endres, Carrington REC, Area Ext. Agronomist
Denise Markle, NC REC, Minot, Area Crop Protection Ext. Specialist
Ron Beneda, Cavalier (ND) County Extension Educator
Scott Knoke, Benson (ND) County Extension Educator
Art Lamey, AgArt LLC.
Mark Miller, Rolette (ND) County Extension Educator
Nels Peterson, Nelson (ND) County Extension Educator
Bill Hodous, Ramsey (ND) County Extension Educator

Project Summary.

The long-term goal is to provide important data on diseases and insect pests that are impacting canola production in North Dakota and Minnesota. These data provide valuable pest information for the current year as well as a historical record of pest trends. The specific objectives were to survey for the following major diseases and insect pests: blackleg, sclerotinia stem rot, aster yellows, blackspot, crucifer flea beetle, bertha armyworm, and diamondback moth. Trap data on bertha armyworm and diamondback moth levels provide producers, Ag consultants, Ag field researchers, and extension agents/specialists with an "early" warning system of when these insect pests have arrived in the area or are active; and more importantly, when the infestation levels could be economically damaging in different canola growing regions of North Dakota. The survey serves as a "Pest Alert" for those occasional insect pest outbreaks, which can be devastating to the unsuspecting canola producer. In addition, the swede midge (*Contarinia nasturtii*), a recent invader of North America, will be surveyed for using pheromone traps. Swede midge injures canola by feeding on the growing point causing deformed plants. In severe infestations with late-planted canola, the plants do not bolt and as a result yield is essentially zero. Swede midge has been found in the U.S. in New York, Vermont, Massachusetts and Connecticut, and in Canada in Ontario, Quebec, Nova Scotia and Saskatchewan.

Diseases in 2008 Canola Survey

A total of 208 canola fields in 25 counties in North Dakota and six fields in two counties in Minnesota were surveyed during 2008. This number represents approximately one field surveyed per 5,000 acres of canola. The survey was initiated on July 30 and continued through August. Crops were surveyed at the swath (mature) stage.

In North Dakota, blackleg was the most common disease in the 2008 survey, with 4% of inspected plants showing penetrating lesions (Fig. 1) and 5% showing superficial lesions (Fig. 2). The superficial lesions usually represent the PG-1 strain of blackleg, which has low pathogenicity on most cultivars. The penetrating lesions might be due to infections by PG-2,

PG-3, PGT or PG-4, all of which have been identified in North Dakota in recent years. Highest infection levels with penetrating lesions were in McLean (14%), Ward (7%), and Ramsey (7%) counties. The presence of PG-3, PGT and PG-4 in recent years is of concern since most blackleg cultivars released in the past were resistant to PG-2 and not the other races of blackleg. No blackleg was observed in Minnesota (Fig. 3 & 4).

Sclerotinia decreased from 7% in 2007 to 2% of plants surveyed in 2008 in North Dakota, with the highest infection levels in Rolette (6.7%) and Cavalier (5.2%) counties (Fig. 5). Sclerotinia was highest in Minnesota with an average of 14% incidence in Roseau county (Fig. 6). Aster yellows decreased from 5% in 2007 to <1% of plants surveyed in North Dakota (Fig.7). It was also low (<1%) in Minnesota (Fig. 8). Alternaria blackspot on the pods continued to be low in both states in 2008 with 0.5% in North Dakota (Fig. 9) and 0.05% in Minnesota (Fig. 10).

Insects in 2008 Canola Survey

For flea beetles, a total of 186 canola fields in 25 counties in North Dakota and six fields in two counties in Minnesota were surveyed during 2008. This number represents approximately one field surveyed per 5,000 acres of canola. The survey was initiated on July 30 and continued through August. Crops were surveyed at the swath (mature) stage.

Flea Beetles: In North Dakota, flea beetles (*Phyllotreta* spp.) were sampled using a 15-inch sweep net in freshly swathed canola fields. Four sweeps at five different sites were used for a total of 20 sweeps per field. Flea beetles were found in 93% of the fields surveyed. Peak population densities occurred in the north central and northeastern regions of North Dakota. The average number of flea beetles per 4 sweeps was 32, with ranges between 0 and 660 (Fig. 11). These numbers represent an increase in flea beetle population levels in swathed canola in 2008 compared to 2007. Large populations of flea beetles in late summer (swath canola) indicate large overwintering populations and potentially large populations the next spring. Therefore, the risk forecast for flea beetle infestation for spring 2009 is high. Use of one of the commercially available insecticide seed treatments for canola is recommended. In Minnesota, the flea beetle population was very low and the risk forecast for Minnesota is low (Fig. 12).

Insect Pheromone Trap Network in Canola

A total of 20 pheromone traps in 12 counties in the major canola growing areas of North Dakota were monitored for two lepidopteran insect pests of canola: bertha armyworm *(Mamestra configurata*), and diamondback moth (*Plutella xylostella*). Pheromone traps were monitored from mid-June to late July. The green bucket unitrap and winged sticky trap were used for bertha armyworm and diamondback moth, respectively. Trap data provide growers, agricultural consultants, agricultural field researchers, and county extension agents/specialists with an early risk warning system to determine when these insect pests are active and what their relative population levels are.

Bertha Armyworm: Populations of bertha armyworm were low and the peak flight occurred during early to mid-July. The highest trap catches were located at trap sites in the northern tier of North Dakota, especially Cavalier County (Fig. 13). About 95% of the trap sites had cumulative trap catches below 300 and the population was considered at low risk for larval infestation.

Overall, the 2008 trapping season was comparable to 2007 for bertha armyworm infestation risk. Cumulative trap catches in 2008 marks the fifth consecutive year with low risk for bertha armyworm infestations. Canola fields did not require any insecticide treatments for control of bertha armyworm in 2008. Monitoring efforts should be continued to track potential increases in bertha armyworm populations.

Diamondback Moth: Field scouting is recommended when more than 100 diamondback moths are captured per trap per week for several weeks prior to the susceptible crop stage (bloom to early pod development). Diamondback moth populations increased during mid-July, probably representing the second generation. However, the majority of the canola crop had flowered and injury from diamondback moth was minimal. Sites with the highest trap counts per trap season were in the northeastern regions of North Dakota (Fig. 14). Fortunately, few canola fields needed any insecticide application for control of diamondback moth in 2008.

Swede Midge: The exotic insect pest, swede midge (*Contarinia nasturtii*) was introduced into North American in 2000 and was recently found on canola in Saskatchewan, Canada. It was of interest to see if any populations exist in North Dakota and Montana because of the proximity of canola production in this region to that in Saskatchewan. In 2008, a total of 45 Jackson pheromone traps in 12 counties in North Dakota and seven traps in five counties in Montana were monitored for swede midge (Fig. 15). All traps were negative for swede midge in North Dakota and Montana. Six suspect specimens from North Dakota were forwarded to an expert for further screening and the results were negative for swede midge. This was a cooperative survey with USDA APHIS PPQ and NDSU / MSU Extension Service.

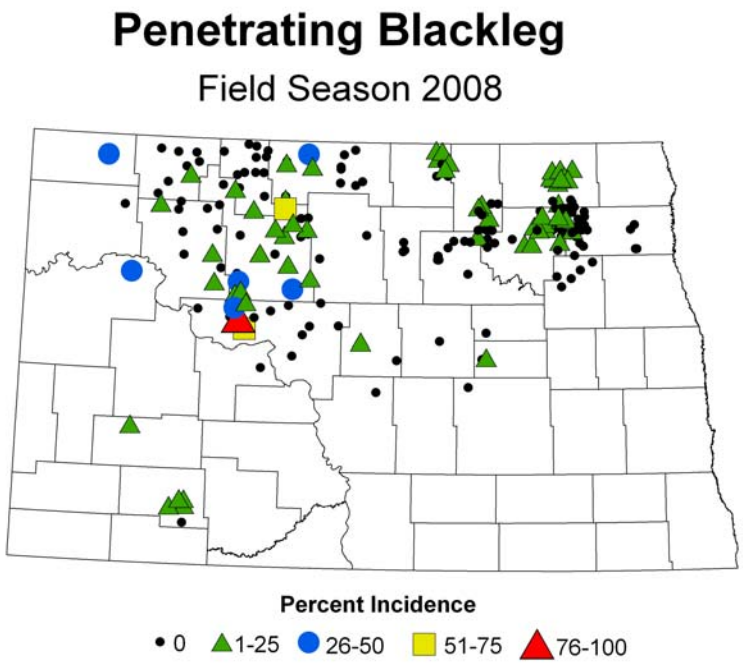

Figure 1. Penetrating Blackleg in Canola.

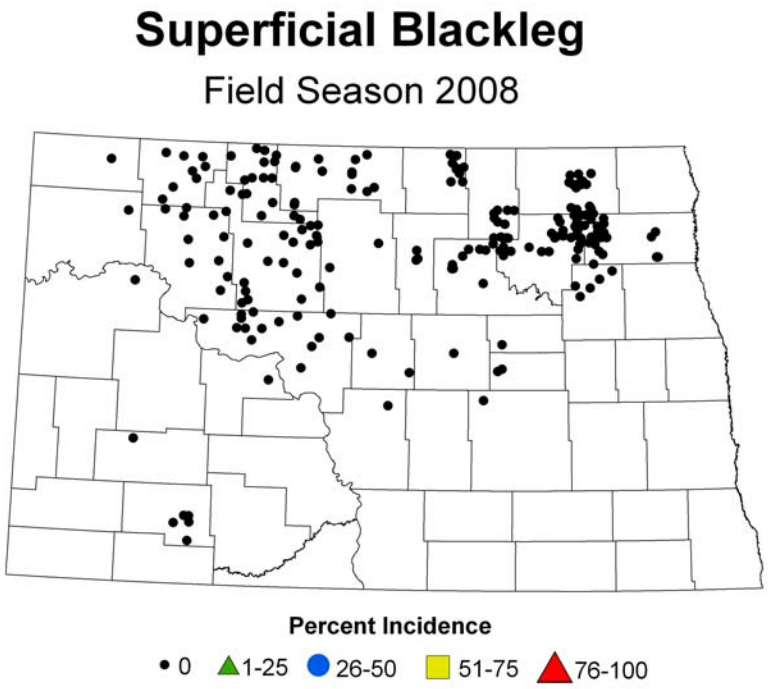

Figure 2. Superficial Blackleg in Canola.

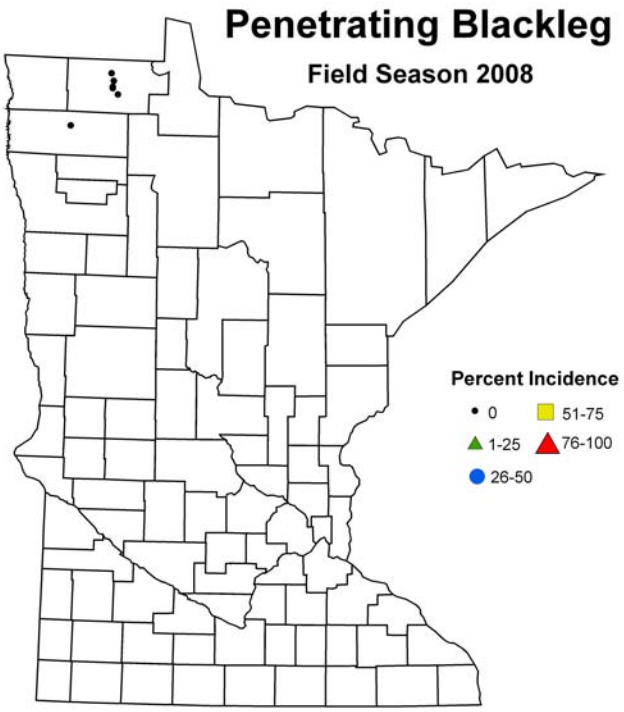

Figure 3. Penetrating Blackleg in Canola.

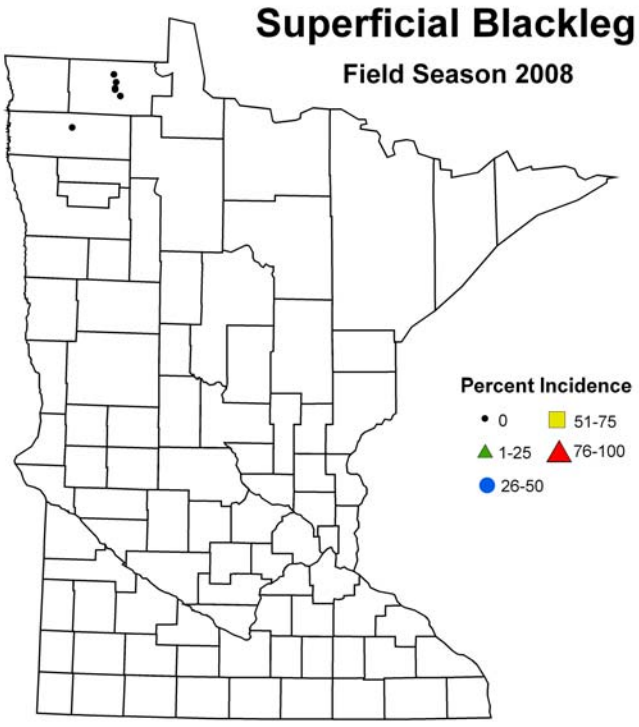

Figure 4. Superficial Blackleg in Canola.

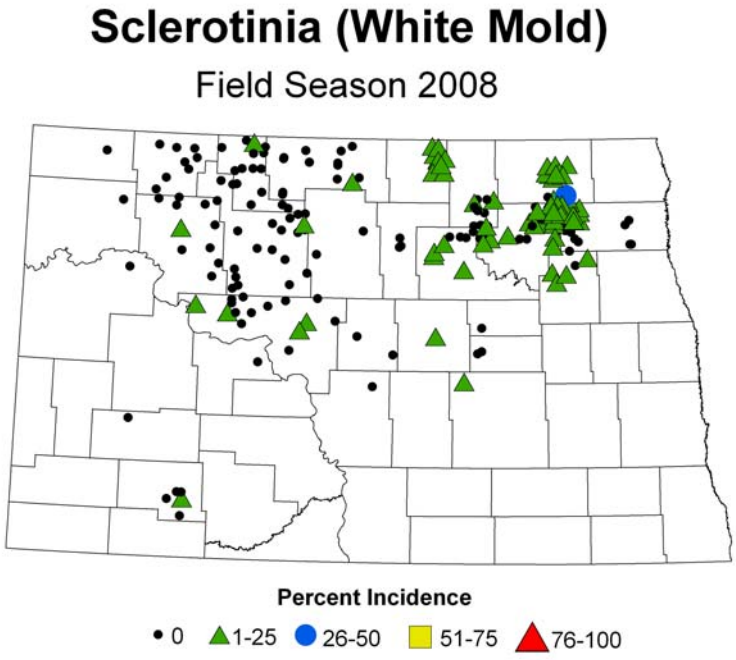

Figure 5. Sclerotinia (White Mold) in Canola.

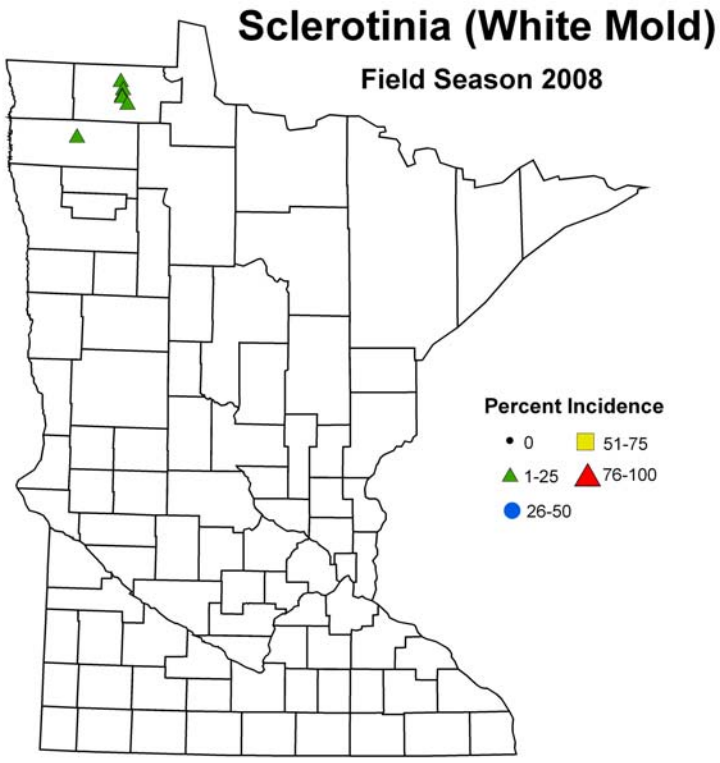

Figure 6. Sclerotinia (White Mold) in Canola.

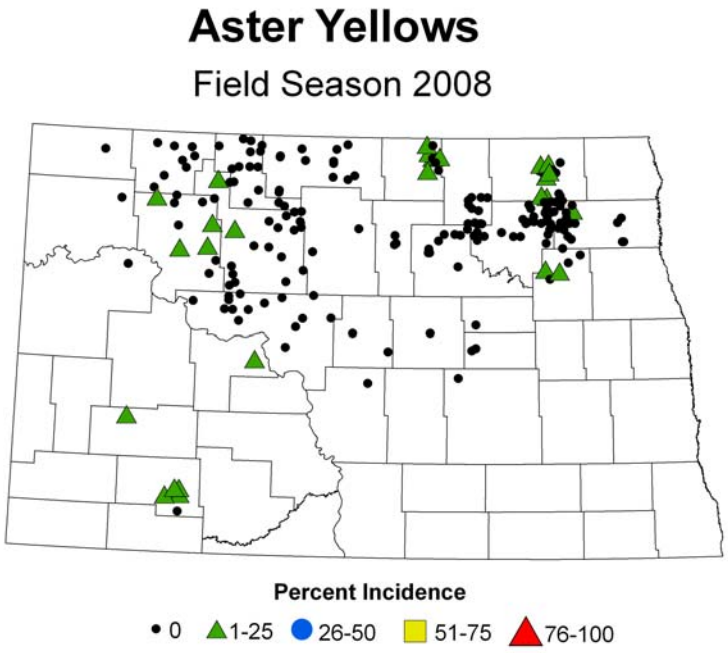

Figure 7. Aster Yellows in Canola.

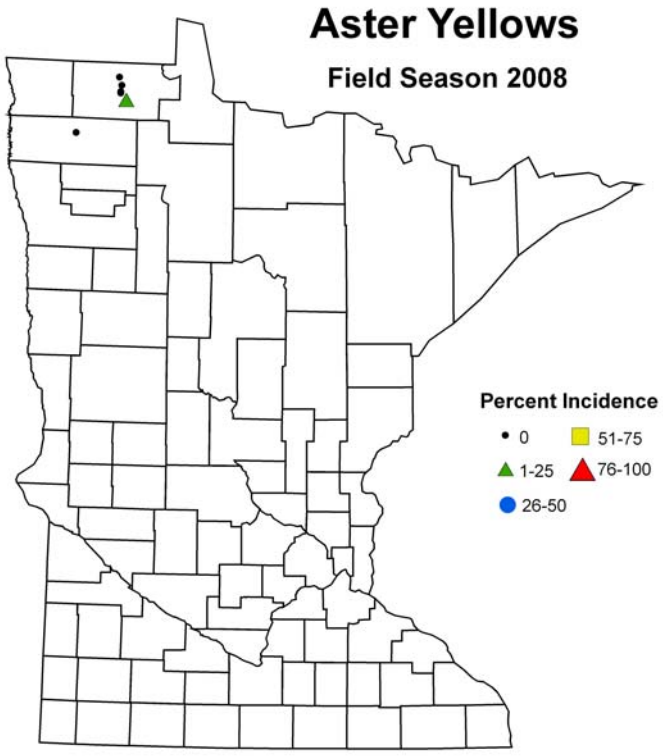

Figure 8. Aster Yellows in Canola.

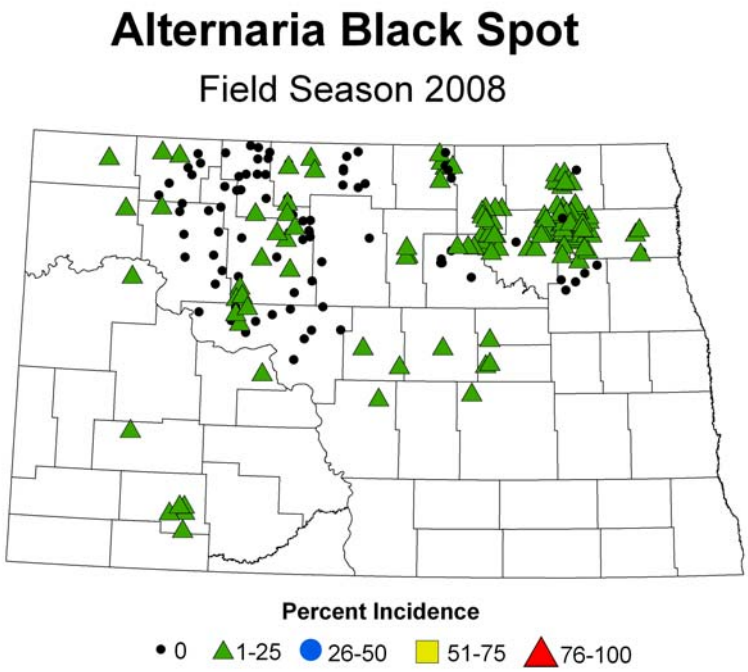

Figure 9. Alternaria Black Spot in Canola.

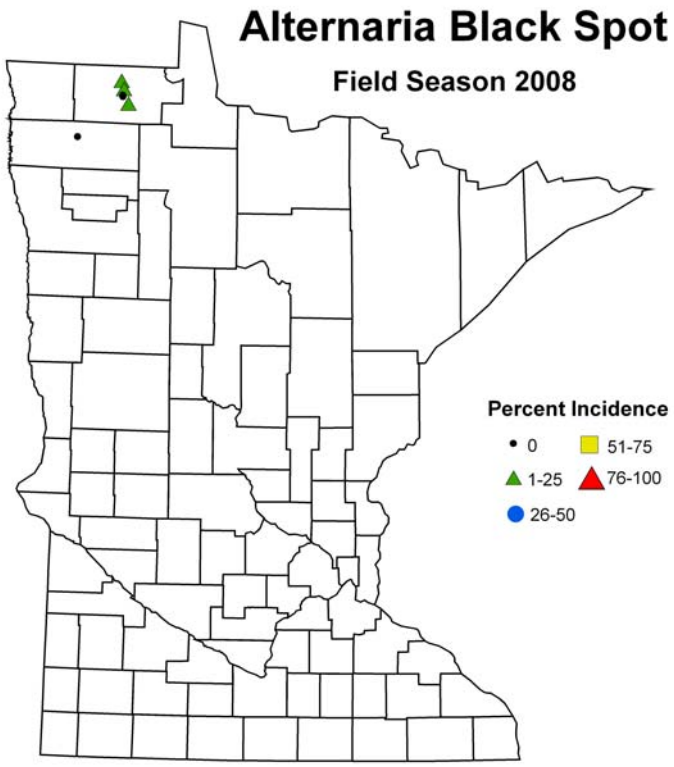

Figure 10. Alternaria Black Spot in Canola.

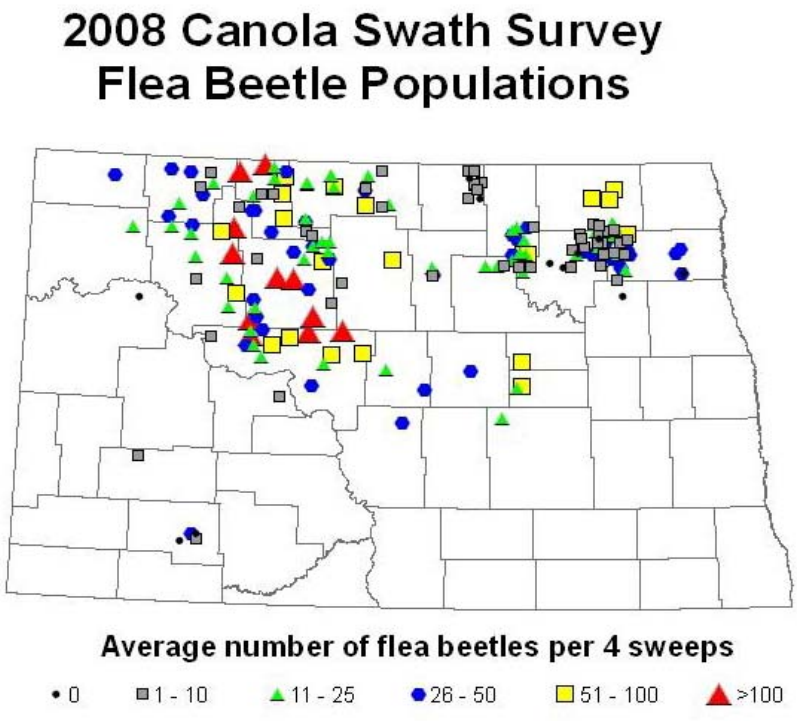

Figure 11. Flea Beetles in Swathed Canola.

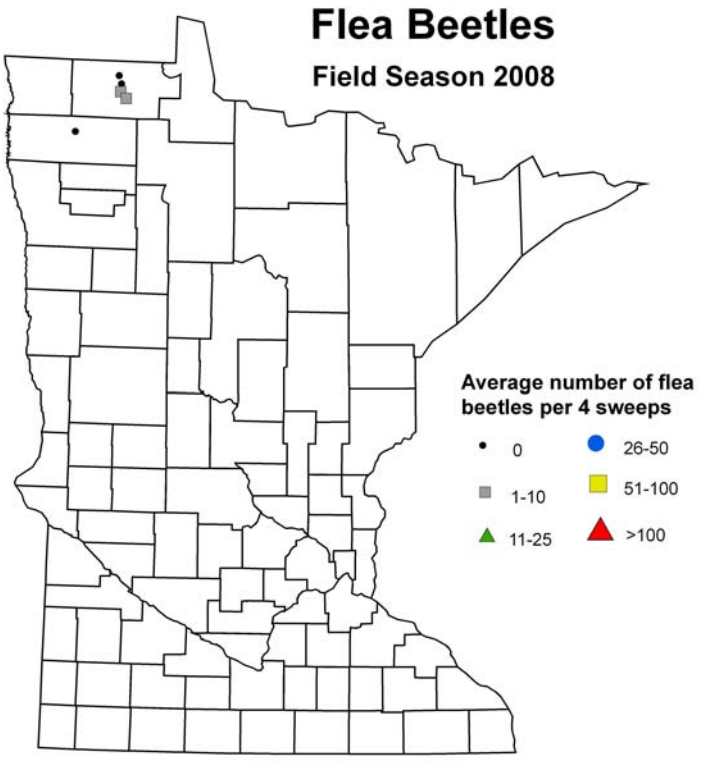

Figure 12. Flea Beetles in Swathed Canola.

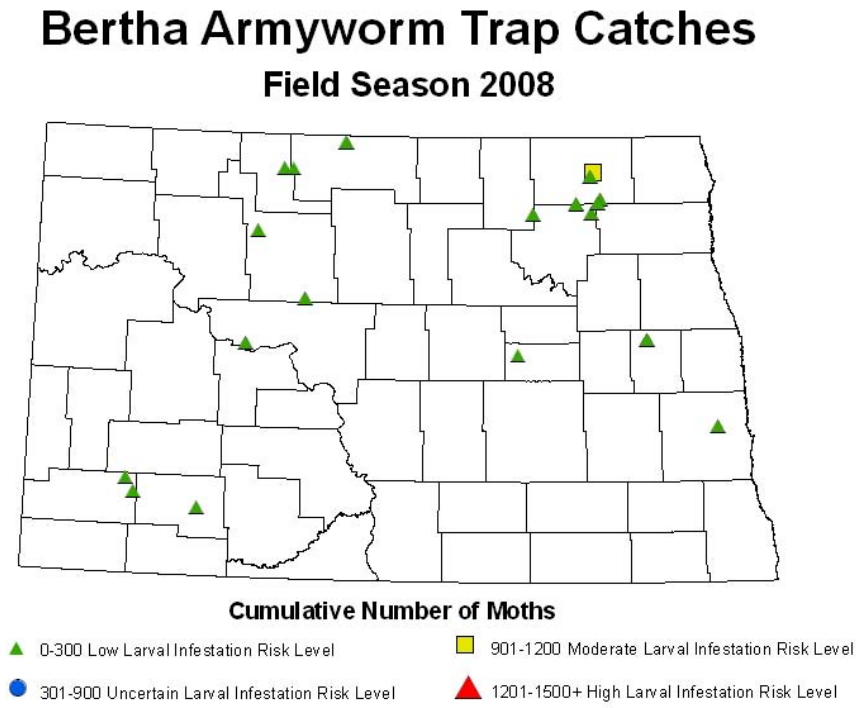

Figure 13. Bertha Armyworm in Canola.

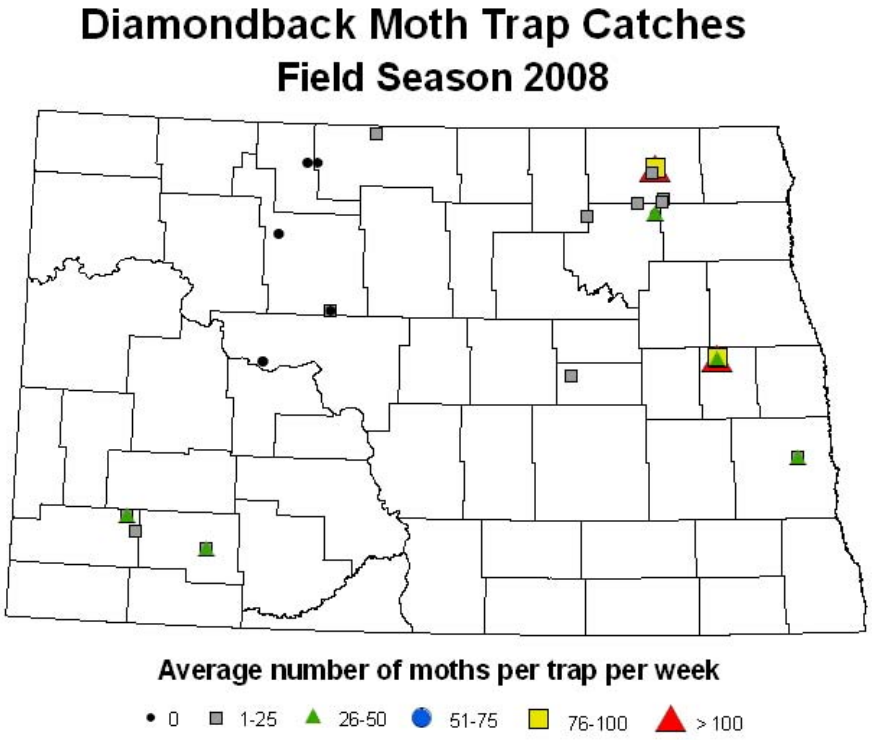

Figure 14. Diamondback Moth in Canola.

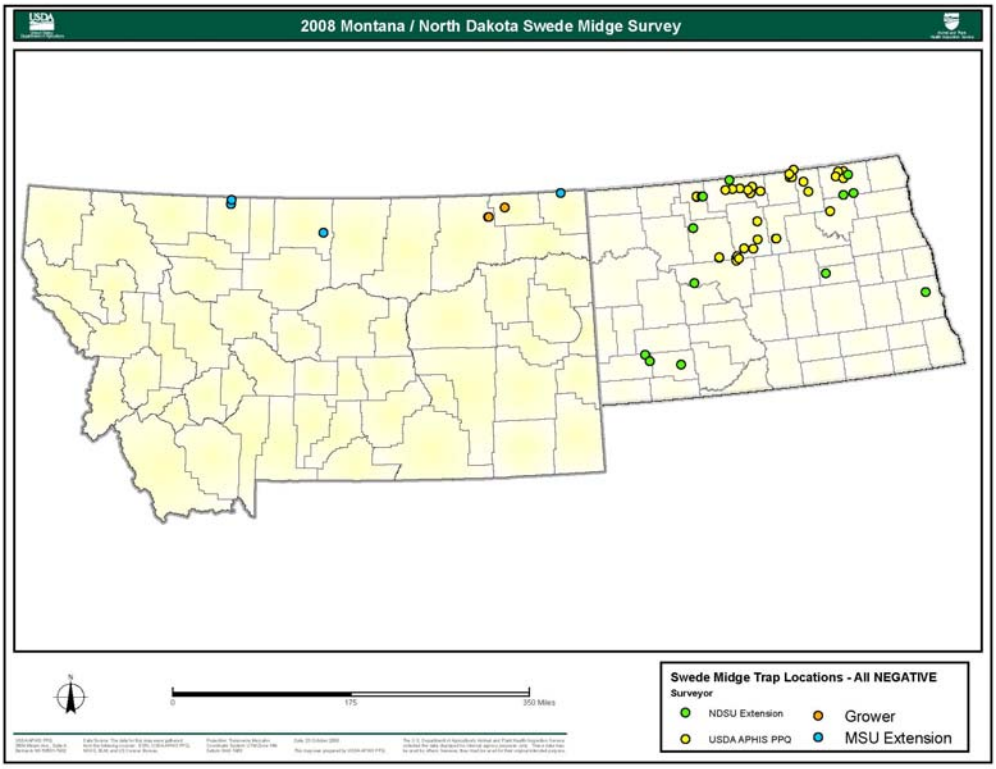

Figure 15. Trap sites for Swede midge in North Dakota and Montana.