

2009 Canola Disease and Insect Survey for North Dakota and Minnesota

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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 (white mold), 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 and Minnesota. The survey serves as a “Pest Alert” for those occasional insect pest outbreaks, which can be devastating to the unsuspecting canola producer.

Data for 2009 is summarized in Table 1.

TABLE 1. 2009 Canola Survey Data.					
		Flea	Blackleg		Sclerotinia/
	#	Beetles	Penetrating	Superficial	White Mold
County	Fields	Ave. 5 sweep	% plants	% plants	% plants
North Dakota					
Cavalier	41	9.10	3.20	6.10	3.40
Nelson	4	7.95	1.50	9.50	7.00
Ramsey	8	0.10	12.75	8.25	0.00
Towner	16	8.31	18.00	0.80	3.20
NE Ave.		7.62	7.62	5.37	3.16
NE Sub Total	69				
Benson	4	x	x	8.00	2.50
Bottineau	10	24.52	23.40	2.20	1.20
McHenry	6	11.47	25.33	5.00	1.50
Pierce	5	32.52	28.00	0.80	1.20
Rolette	9	1.44	8.44	0.00	2.00
NC Ave.		14.40	17.71	2.59	1.69
NC Sub Total	34				
Burke	7	8.74	29.43	2.57	0.29
Divide	1	0.40	14.00	6.00	0.00
Mountrail	9	6.40	41.22	2.22	0.00
Renville	11	11.56	33.45	3.82	0.55
Ward	15	17.52	32.27	1.60	0.53
Williams	1	13.40	2.00	8.00	0.00
NW Ave.		11.88	32.84	2.68	0.36
NW Sub Total	44				
Burleigh	1	x	0.00	0.00	0.00
Eddy	1	9.40	0.00	0.00	2.00
Foster	1	2.20	0.00	0.00	0.00
Sheridan	3	42.07	0.00	3.00	2.50
Wells	1	2.40	0.00	2.00	0.00
C Ave.		23.37	0.00	1.75	1.50
C Sub Total	7				
Dunn	1	1.60	0.00	0.00	0.00
McLean	13	39.45	38.38	4.15	0.38
Mercer	1	58.20	0.00	0.00	0.00
WC Ave.		38.17	33.27	3.60	0.33
WC Sub Total	15				
Hettinger	7	2.17	0.00	0.00	0.00
Stark	1	1.60	0.00	0.00	0.00
SW Ave.		2.10	0.00	0.00	0.00
SW Sub Total	8				
ND Ave.		13.32	16.63	3.55	1.67
ND Total	177				
Minnesota					
Kittson	2	5.40	0.00	1.00	7.00
Roseau	5	3.64	0.00	0.00	3.20
MN Ave.		4.14	0.00	0.29	4.29
MN Total	7				
Grand Total	184				

Diseases in 2009 Canola Survey

A total of 177 canola fields in 25 counties in North Dakota and seven fields in two counties in Minnesota were surveyed during 2009. This number represents approximately one field surveyed per 5,000 acres of canola. The survey was initiated later this year due to the cool field season, and started in August and continued through early October. Crops were surveyed at the mature stage either in the swath or standing (direct combine). In Figure 1 and 2, the numbers of fields surveyed in the swath and standing are presented for North Dakota and Minnesota, respectively.

In North Dakota, blackleg was the most common disease in the 2009 survey, with an average of 16.6% showing penetrating lesions (Fig. 3) and 3.6% showing superficial lesions (Fig. 4). This represents a significant increase from 2008 with only 4% of inspected plants showing penetrating lesions and 5% showing superficial lesions in North Dakota. 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 Mountrail (41%), McLean (38%) and Renville (33%) 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 races of blackleg pathogenicity groups. Efforts are in place to characterize the reaction of blackleg isolates retrieved from some of the most heavily affected fields. Blackleg was much lower in Minnesota with 0% of inspected plants showing penetrating lesions (Fig. 5) and 0.3% showing superficial lesions (Fig. 6). There was no blackleg observed in Minnesota in 2008.

The level of sclerotinia (white mold) was low in 2009 (1.7%) and similar to the level in 2008 (2%) in North Dakota. The highest infection levels occurred in Nelson (7.0%) and Cavalier (3.4%) counties (Fig. 7). Sclerotinia decreased in Minnesota with an average of 4.3% in 2009 compared to 13.7% in 2008 (Fig. 8).

Insects in 2009 Canola Survey

For flea beetles, a total of 172 canola fields in 23 counties in North Dakota and seven fields in two counties in Minnesota were surveyed during 2009. This number represents approximately one field surveyed per 5,000 acres of canola. The survey was initiated later this year due to the cool field season, and started in August and continued through early October. Crops were surveyed at the mature stage either in the swath or standing (direct combine).

Flea Beetles: In North Dakota, flea beetles (*Phyllotreta* spp.) were sampled using a 15-inch sweep net in freshly swathed or standing canola fields. Four sweeps at five different sites were used for a total of 20 sweeps per field. Flea beetles were found in 94% of the fields surveyed. Peak population densities occurred in the west central (McLean County), north central (Bottineau, Ward, Renville and Pierce Counties) and northeastern (Towner County) regions of North Dakota. The average number of flea beetles per 4 sweeps decreased from 32 adults in 2008 to 13 adults in 2009. The range was between 0 and 96 (Fig. 9). These numbers represent a decreasing flea beetle population levels in canola in 2009 compared to 2008. Large populations

of flea beetles in late summer indicate large overwintering populations and potentially large populations the next spring. Therefore, the risk forecast for flea beetle infestation for spring 2010 is low to moderate. In Minnesota, the flea beetle population was very low (an average of 4 beetles per 4 sweeps) and as a result the risk forecast for Minnesota is low (Fig. 10). Use of one of the commercially available insecticide seed treatments for canola is still recommended.

2009 Insect Pheromone Trapping Network in Canola

A total of 12 pheromone traps in 9 counties in the major canola growing areas of North Dakota and four pheromone traps in four counties in Minnesota 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 unitraps were used for bertha armyworm and the winged sticky trap for diamondback moth. 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 later this year during mid- to late July. The highest cumulative number of moths was only 119 and was located in Cavalier County in northeastern North Dakota (Fig. 11). All of the trap sites had cumulative trap catches below 300 and were considered at low risk for larval infestation. Overall, the 2009 trapping season was comparable to 2008 for bertha armyworm infestation risk. Cumulative trap catches in 2009 marks the sixth consecutive year with low risk for bertha armyworm infestations. In Minnesota, cumulative trap catches of bertha armyworm were also below 300 and considered at low risk for larval infestation (Fig. 12). Canola fields did not require any insecticide treatments for control of bertha armyworm in North Dakota or in Minnesota during 2009. 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 were lower in 2009 compared to 2008, probably due to the cool weather in June and July. Cumulative number of moths per season ranged from 46-554 moths per season (Fig. 13). Sites with the highest cumulative number of moths per season were in the east central regions of North Dakota. In Minnesota, diamondback moth populations were higher and the cumulative number of moths per season ranged from 531-1072 (Fig. 14). Although none of the canola fields required any insecticide treatment in North Dakota, all of the canola fields monitored in Minnesota required an insecticide treatment for control of diamondback moth in 2009.

Conclusions

Canola Survey. A total of 177 canola fields in 25 counties in North Dakota and seven fields in two counties in Minnesota were surveyed during 2009. In North Dakota, blackleg was the most common disease in the 2009 survey and increased from 2008. However, blackleg continued to be low in Minnesota in 2009. Sclerotinia (white mold) was low in North Dakota

(1.7%) and in Minnesota (4.3%). For flea beetles, the populations in the swath decreased in 2009 compared to 2008. Large populations of flea beetles in late summer indicate large overwintering populations and potentially large populations for the next spring. Therefore, the risk forecast for flea beetle infestation for spring 2010 is low to moderate. In Minnesota, the flea beetle risk forecast is low. Use of one of the commercially available insecticide seed treatments for canola is recommended for control of flea beetles in 2010.

Canola Insect Pheromone Trapping Network. A total of 12 pheromone traps in 9 counties in the major canola growing areas of North Dakota and four pheromone traps in four counties in Minnesota were monitored for bertha armyworm and diamondback moth. For bertha armyworm, all of the trap sites in North Dakota were considered to be at low risk for larval infestation based on cumulative trap catches that were below 300 moths per season. Cumulative trap catches in 2009 marks the sixth consecutive year with low risk for bertha armyworm infestations in North Dakota. In Minnesota, cumulative trap catches of bertha armyworm were also below 300 and considered at low risk for larval infestation. Canola fields did not require any insecticide treatments for control of bertha armyworm in North Dakota or in Minnesota during 2009. Diamondback moth populations were lower in 2009 compared to 2008, probably due to the cool weather in June and July. However, diamondback moth populations were higher and at economic levels in Minnesota. Although none of the canola fields required any insecticide treatment for control of diamondback moth in North Dakota, all of the canola fields monitored in Minnesota required an insecticide spray in 2009. Monitoring efforts should be continued to track potential pest problems and risks from bertha armyworm and diamondback moth in canola.

Publications/Abstracts

Real-time pest reports were published in the NDSU Extension's *Crop & Pest Report* when available. Maps were also posted on the IPM website on the canola survey and canola insect pheromone trapping network.

<http://www.ag.ndsu.nodak.edu/aginfo/ndipm/index.htm>

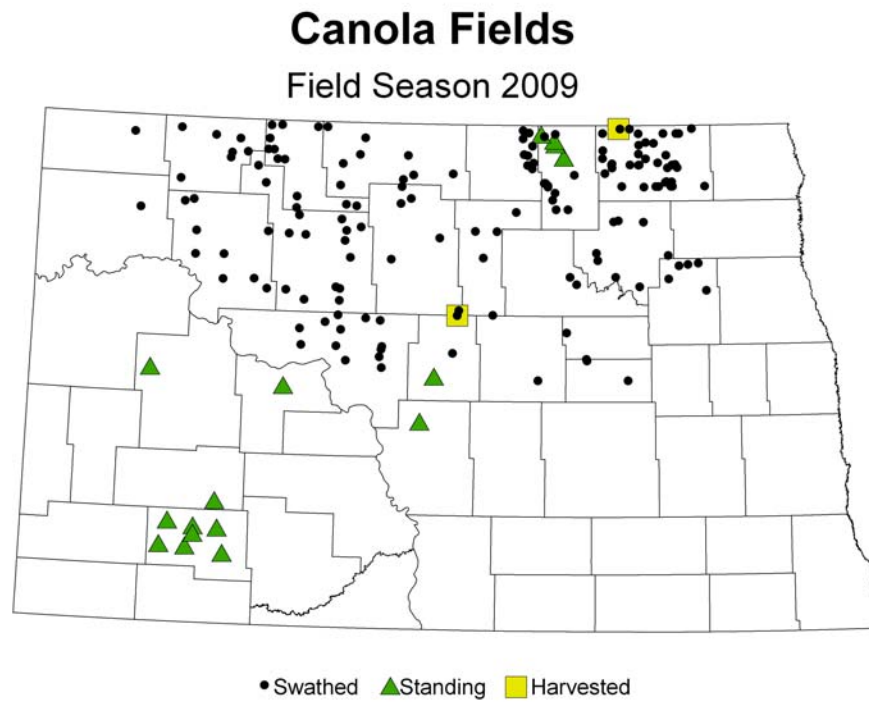


Figure 1. Canola fields in North Dakota.

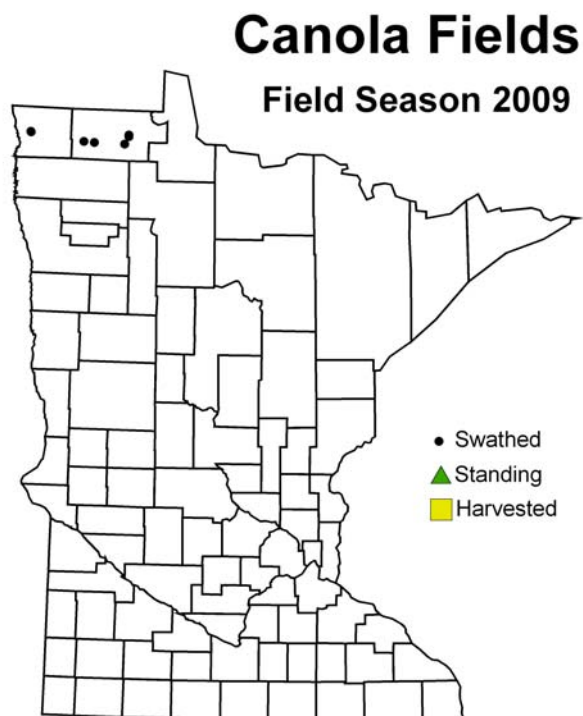


Figure 2. Canola fields in Minnesota.

Penetrating Blackleg

Field Season 2009

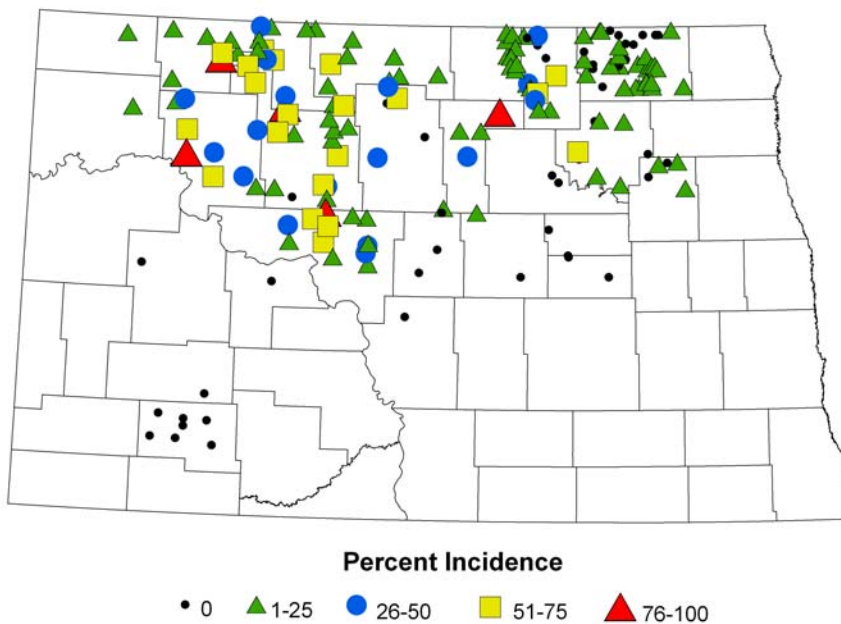


Figure 3. Penetrating Blackleg in Canola.

Superficial Blackleg

Field Season 2009

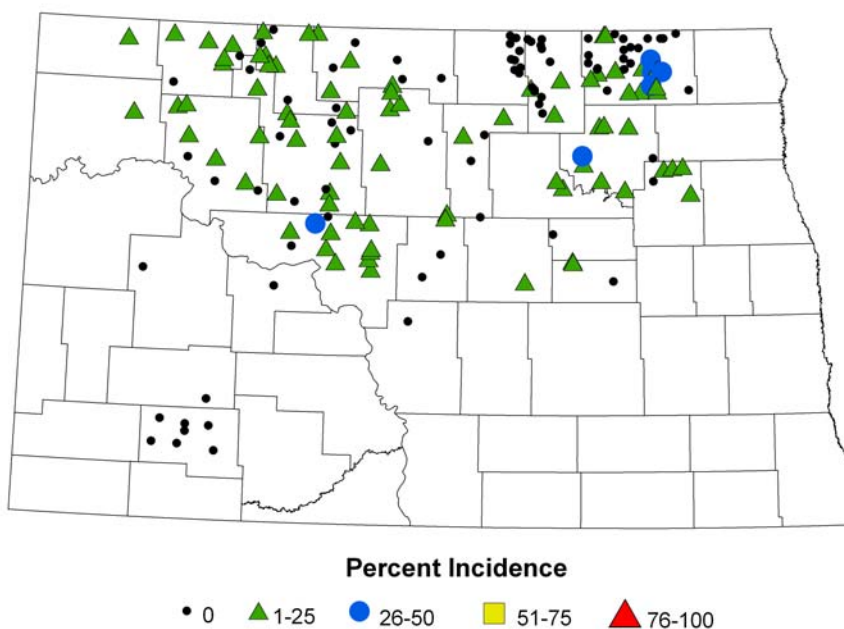


Figure 4. Superficial Blackleg in Canola.

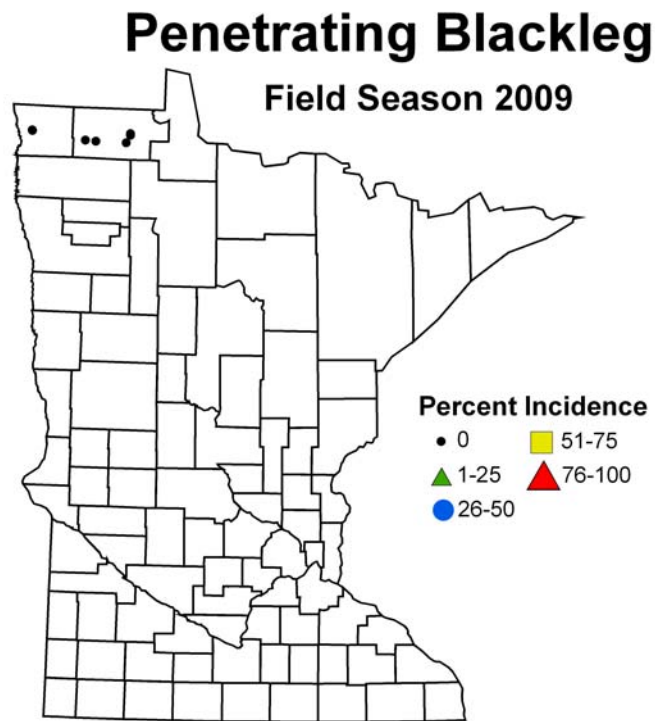


Figure 5. Penetrating Blackleg in Canola.

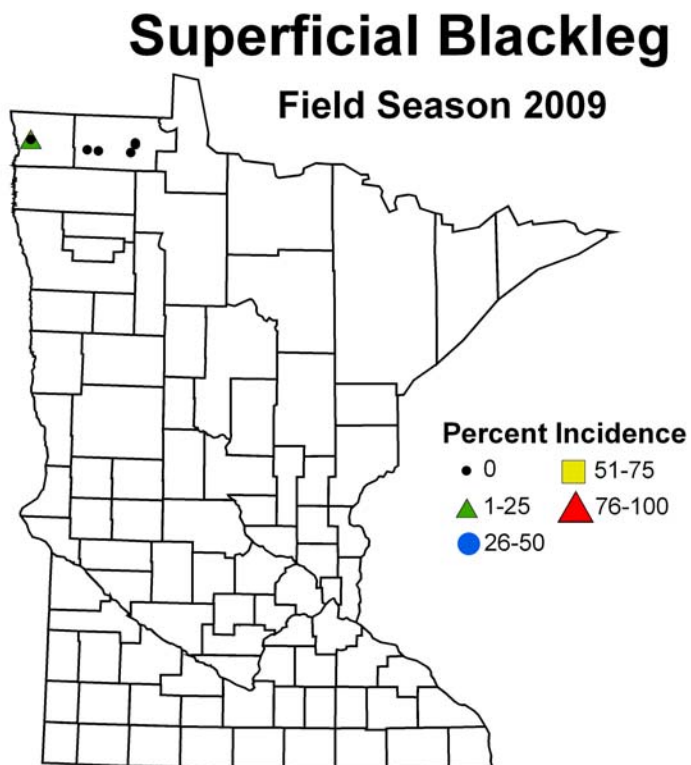
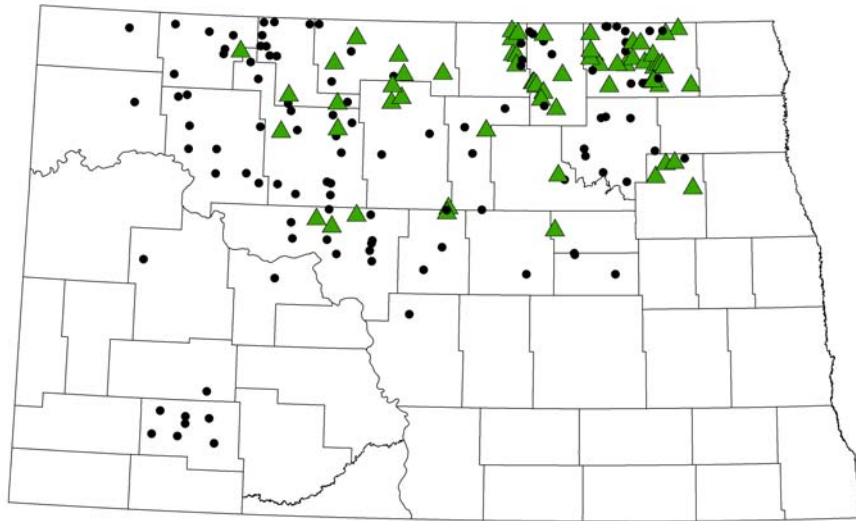


Figure 6. Superficial Blackleg in Canola.

Sclerotinia (White Mold)

Field Season 2009



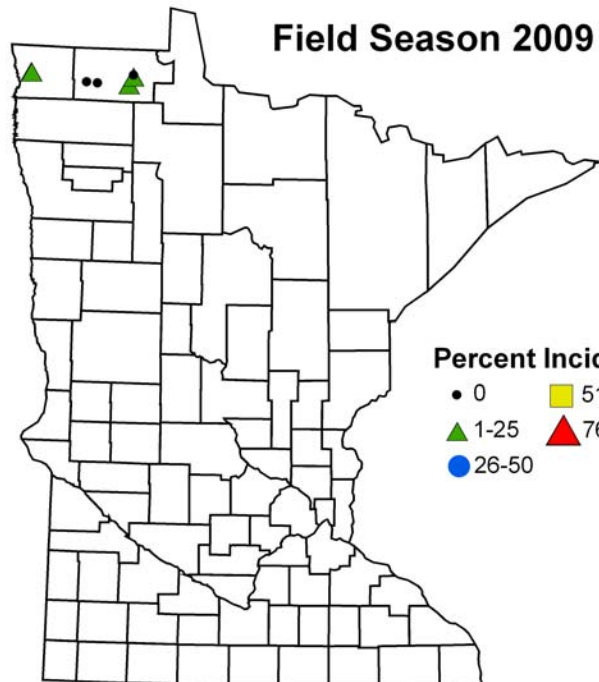
Percent Incidence



Figure 7. Sclerotinia (White Mold) in Canola.

Sclerotinia (White Mold)

Field Season 2009



Percent Incidence

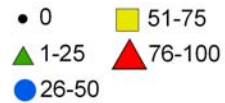
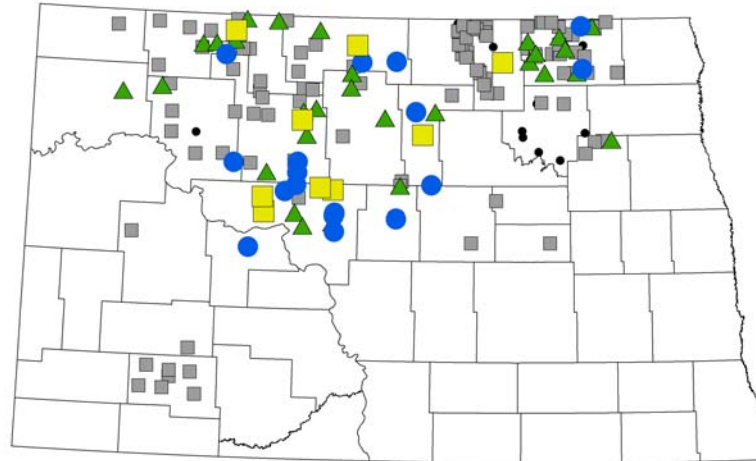


Figure 8. Sclerotinia (White Mold) in Canola.

Flea Beetles in Canola (late summer)

Field Season 2009



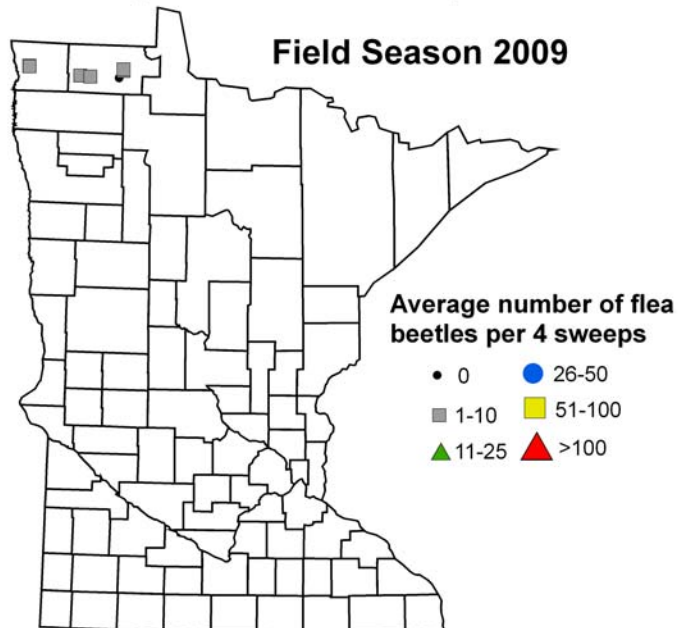
Average number of flea beetles per 4 sweeps

• 0 ■ 1-10 ▲ 11-25 ● 26-50 ■ 51-100 ▲ >100

Figure 9. Flea Beetles in Swathed Canola.

Flea Beetles in Canola (late summer)

Field Season 2009



Average number of flea beetles per 4 sweeps

• 0 ● 26-50
■ 1-10 ■ 51-100
▲ 11-25 ▲ >100

Figure 10. Flea Beetles in Swathed Canola.

Bertha Armyworm Trap Catches

Field Season 2009

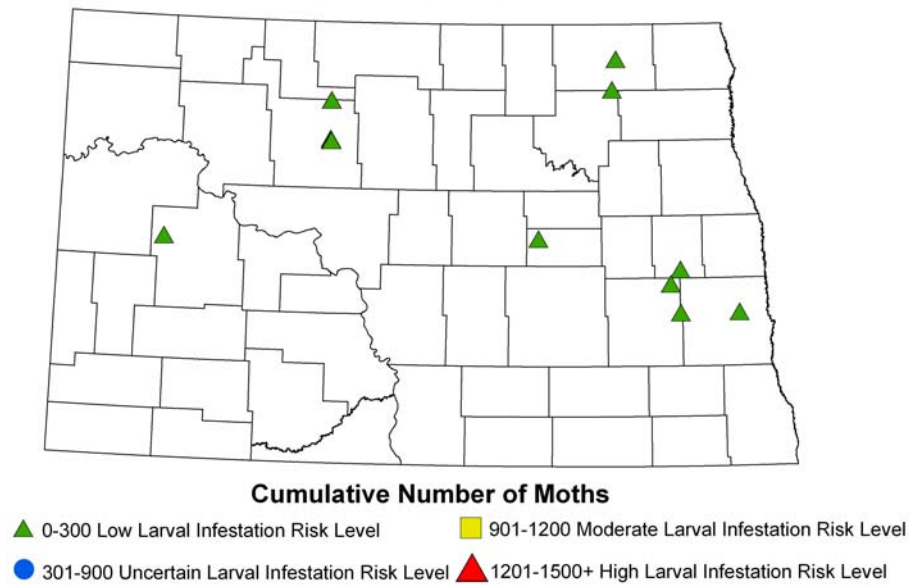


Figure 11. Bertha Armyworm in Canola.

Bertha Armyworm Trap Catches

Field Season 2009

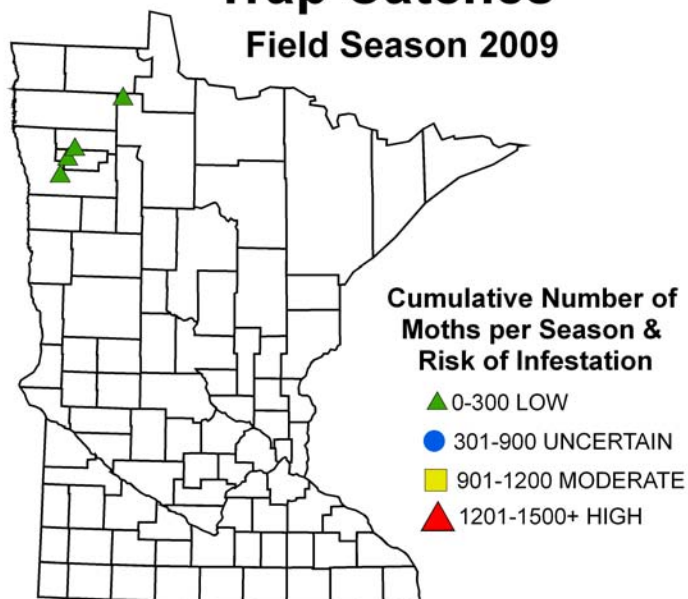


Figure 12. Bertha Armyworm in Canola.

Diamondback Moth Trap Catches

2009 Field Season

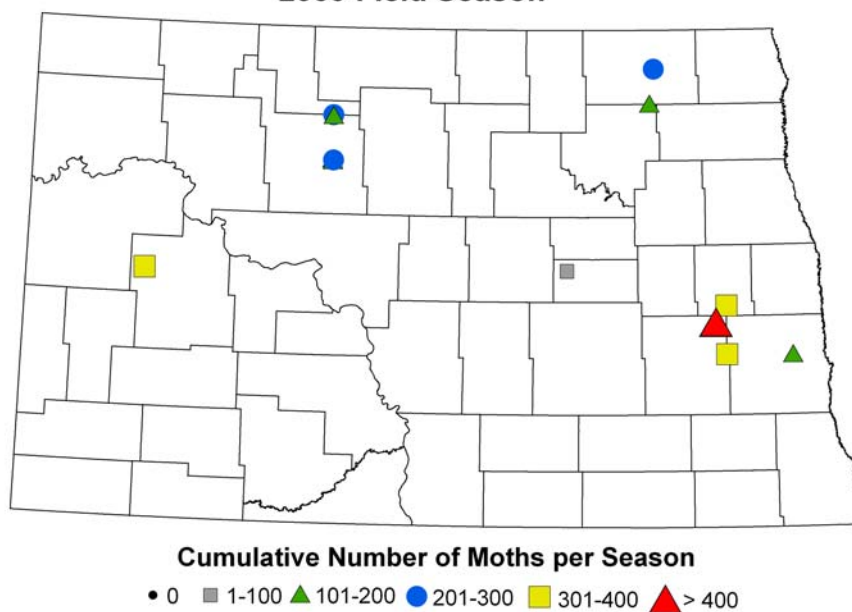


Figure 13. Diamondback Moth in Canola.

Diamondback Moth

Trap Catches

Field Season 2009

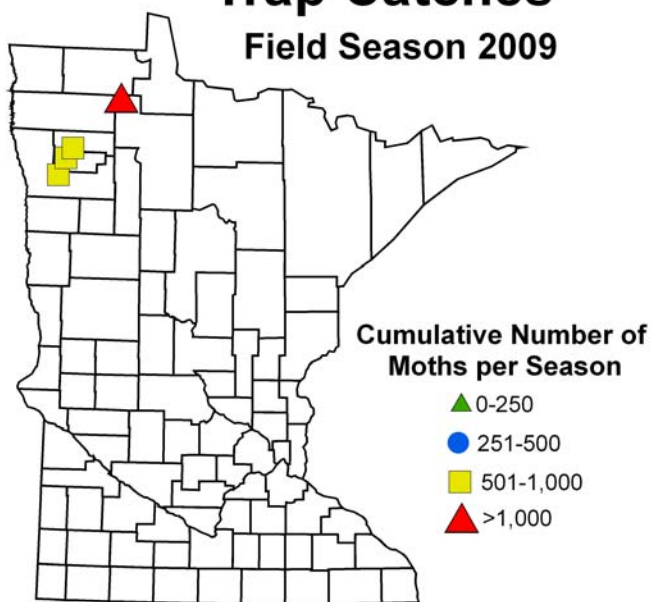


Figure 14. Diamondback Moth in Canola.