

Pests of Canola



What We Want!



2010 Douglas County



(2) Groups of Canola Pests

1) Insects Pests:

- Cabbage Seedpod Weevil
- Flea Beetle
- Aphids
 - Cabbage Aphid
 - Turnip Aphid
- Lygus Bug
- Several others...



Pests of Canola Cont...

2) Plant Pathogens:

- Black Leg (i.e. Stem Canker)
- Damping-off and Seed Rot
- Sclerotinia (Stem Rot)
- Alternaria (Blackspot)
- Several Others...



Insect Pests/Pathogens for Canola

- 1) Pest Description / What is it?
- 2) Appearance/Symptoms:
- 3) Damage:
- 4) Monitoring:
- 5) Thresholds/Management Options:

Flea Beetle/Striped Flea Beetle

1) Pest Description:

- Flea beetles belong to the Family: Chrysomelidae and jump like “fleas” when disturbed hence the name. They are bluish-black, 2 – 3 mm and have enlarged hind legs.



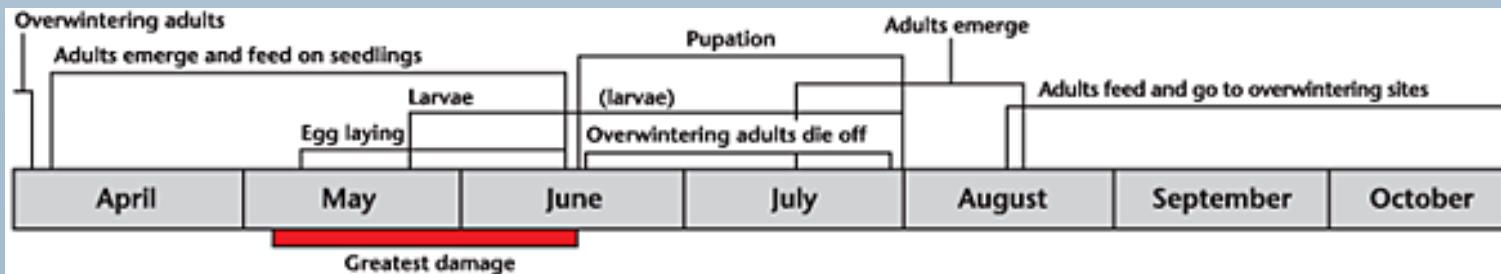
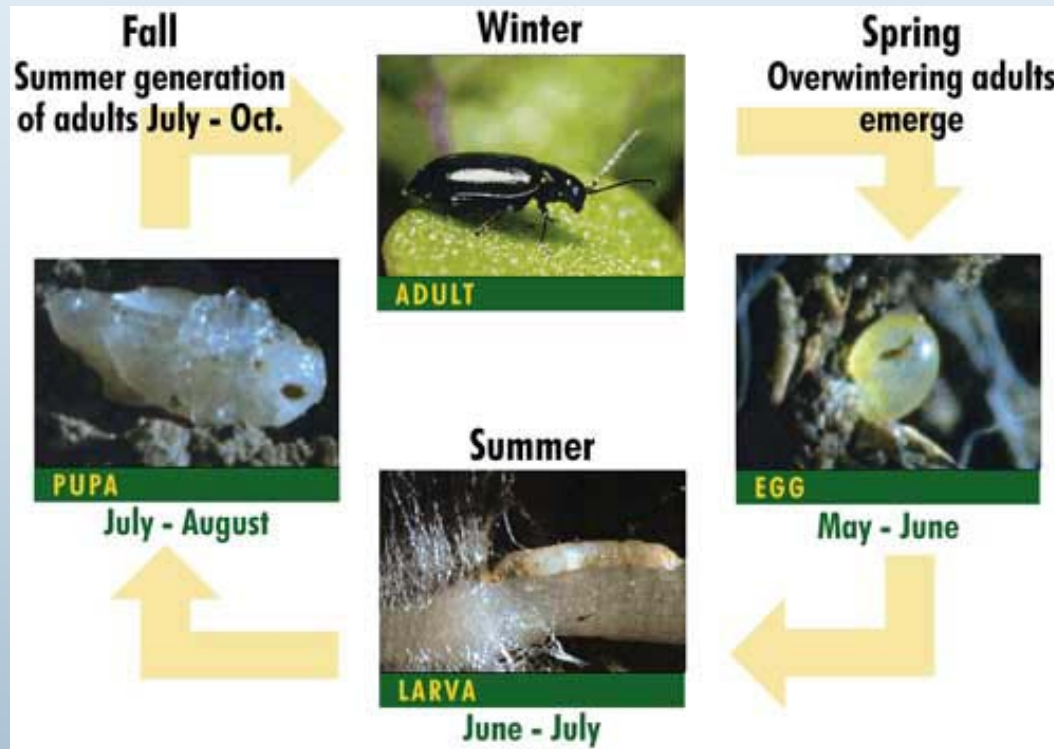
Flea Beetles - *Phyllotreta Cruciferae* (Goeze)



Striped Flea Beetle - *Phyllotreta Striolata* (F.)

Flea Beetle/Striped Flea Beetle

2) Lifecycle:



Flea Beetle/Striped Flea Beetle

3) Damage/Symptoms:

- Moderate to severe leaf feeding



Flea Beetle/Striped Flea Beetle

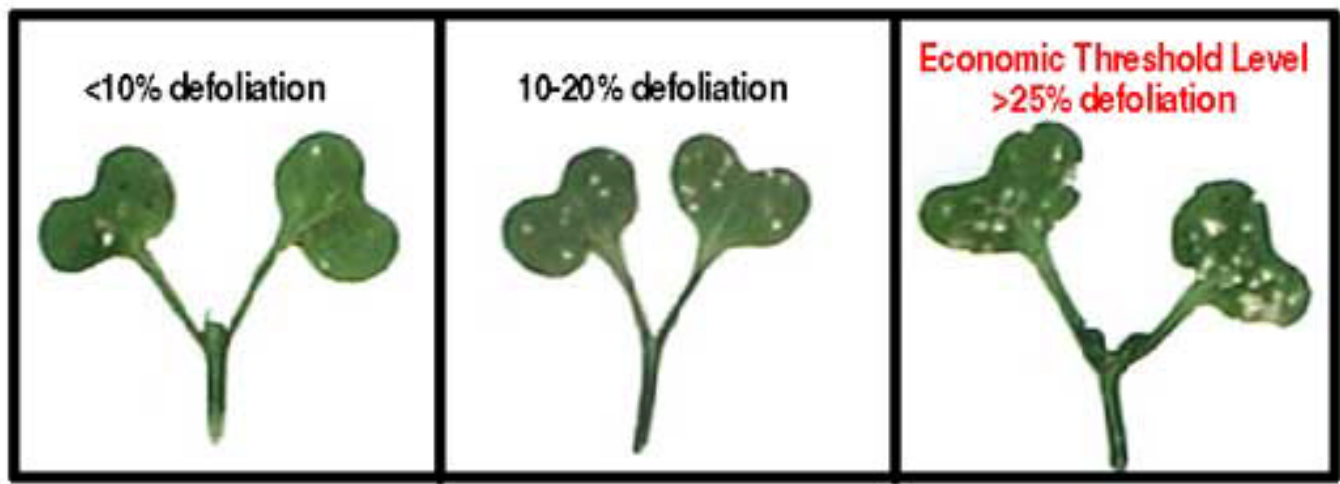
4) Monitoring:

- Note flea beetle densities in the fall. This will be the first signal of potential problems next spring. If flea beetles are abundant, one may consider using insecticides (**seed treatment**) at planting.
- Scout fields in the spring, and assess damage to cotyledons and the first true leaves of seedlings daily.
- Continue scouting for the first 14 days after emergence, especially on sunny, calm days when temperatures exceed 14° C.
- When scouting fields for flea beetle damage, it is important to understand that flea beetles generally invade canola fields from the field edges.

Flea Beetle/Striped Flea Beetle

5) Thresholds/Management:

- Canola seedlings can withstand 50% leaf loss. Flea beetles can damage plants very quickly, however, so the economic threshold for flea beetle feeding on canola is when there is 25% defoliation and flea beetles are present.



Applying controls at 25% defoliation will reduce the risk of flea beetles reaching a level where yield loss and plant development are substantially reduced.

Flea Beetle/Striped Flea Beetle

5) Management Options:

Cultural control:

- The larger the seedling, the more it can withstand injury from flea beetle feeding. Seedlings of vigorously growing varieties are able to tolerate flea beetle feeding more than seedlings of less vigorous varieties.
- Crop rotation is not an effective means of controlling flea beetles. Adults overwinter inside and outside of the cropped areas and are capable of long-range migration.

Biological: Flea beetles emerge in large numbers during a relatively short period of time and tend to overwhelm the parasites and predators.

Flea Beetle/Striped Flea Beetle

5) Management Options:

Chemical:

- Canola, mustard and rapeseed crops can be protected from flea beetle attack through insecticide application as a seed treatment, granules applied with the seed or post-emergence foliar sprays.
- If using a foliar application; Apply sprays when it is sunny and warm, and the beetles are active and exposed on plants and soil.

Cabbage Seed Pod Weevil

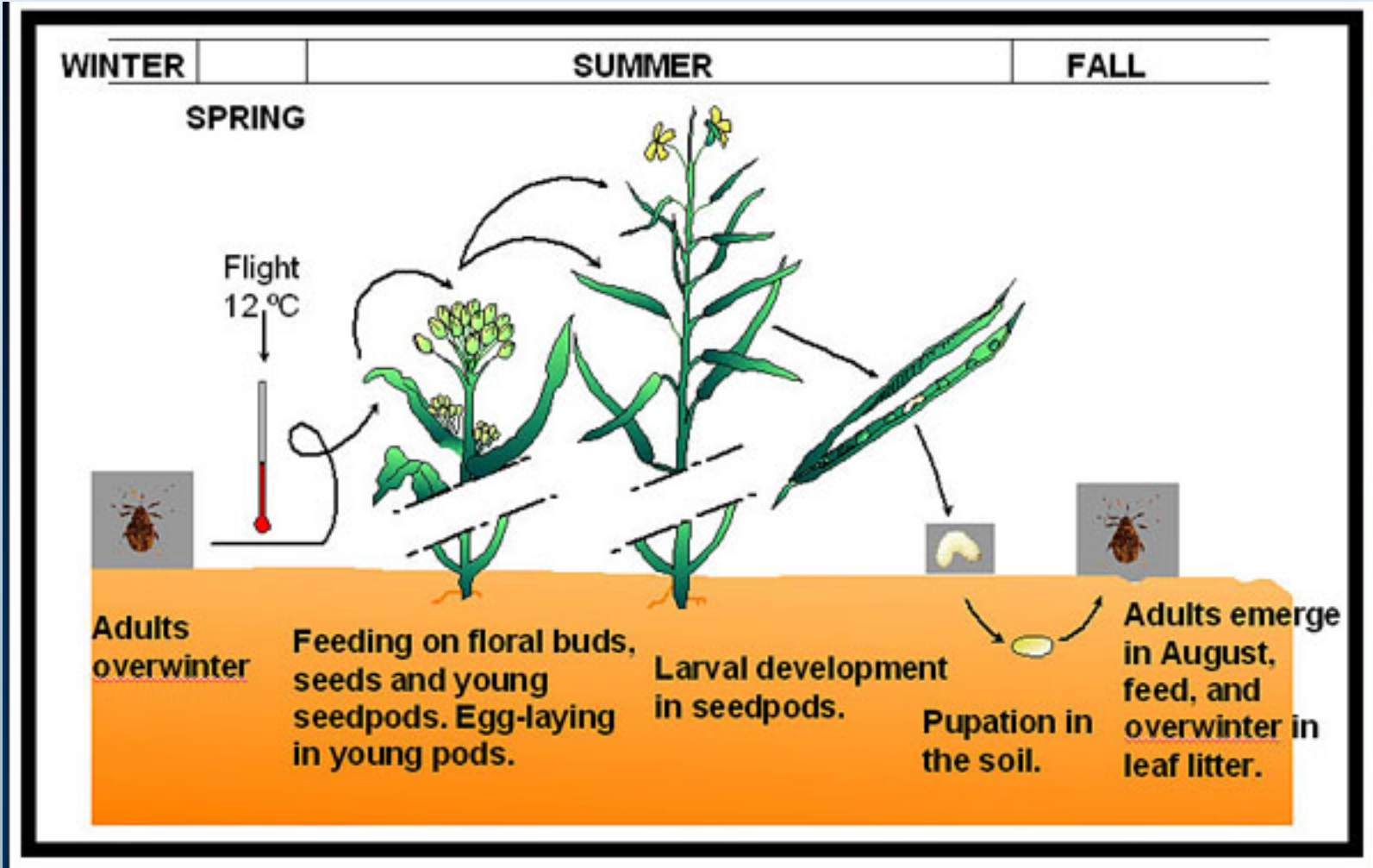
1) Pest Description:



- Adult weevils are ash-grey and approximately 3 to 4 mm long. They have a prominent curved snout that is typical of most weevils.

Cabbage Seed Pod Weevil

2) Lifecycle:



Cabbage Seed Pod Weevil

3) Damage/Symptoms:

- Canola pods harboring cabbage seedpod weevil larvae often appear distorted. When larvae consume some seeds within pods, the undamaged seeds enlarge and mature, often leaving misshapen pods.



Cabbage Seed Pod Weevil

4) Monitoring:

- Cabbage seedpod weevil adult abundance can be monitored by taking sweep net samples. Sampling should begin when the crop first enters the bud stage and continue through the flowering period.
- Select 10 locations within each field, and at each location count the number of weevils from (10) 180 degree sweeps.
- Sampling locations should include both the perimeter and interior of the field, to obtain an accurate estimate of weevil numbers throughout the field.

Cabbage Seed Pod Weevil

5) Thresholds/Management:

- Insecticide application is warranted when an average of 3 to 4 adult weevils are collected per sweep.



Cabbage Seed Pod Weevil

5) Management Options:

Cultural control:

- At present, trap cropping is the most promising cultural strategy for controlling the cabbage seedpod weevil.
- By planting a trap border of early flowering Canola, Cabbage seedpod weevils may be controlled with an insecticide applied to the perimeter before they spread throughout the field.
- Alternatively, a strip of the same variety planted seven to 10 days before the rest of the field, can serve as a trap for adult weevils.

Cabbage Seed Pod Weevil

5) Management Options:

Chemical:

- Canola, mustard and rapeseed crops can be protected from flea beetle attack through insecticide application as a seed treatment, granules applied with the seed or post-emergence foliar sprays.
- If using a foliar application; Apply sprays when it is sunny and warm, and the beetles are active and exposed on plants and soil.
- *Spray late in the day to minimize harmful effects to beneficial insects in the crop, especially bees.

Cabbage Aphid

1) Pest Description:



- Aphids are small pear-shaped insects that may be green, yellow, brown, red, or black depending on the species and the plants they feed on. The presence of *cornicles* (a pair of tube-like structures attached to the abdomen) distinguishes aphids from all other insects.

Cabbage Aphid

2) Damage/Symptoms:



- Canola damaged in the seedling stage appears stunted and is more susceptible to winterkill.
- Damaged seedlings will have curled leaves with shortened nodes. The canola may exhibit a purplish tint associated with plant stress.

Cabbage Aphid

2) Damage/Symptoms:



As the heads emerge and bloom begins, aphids will concentrate on the heads. Aphid populations that develop during early bloom and pod-fill can cause deformed, stunted or completely sterile pods. Black sooty mold is also associated with aphid colonies. Aphids have also been reported to transmit several viruses to canola.

Cabbage Aphid

3) Monitoring/ Thresholds:

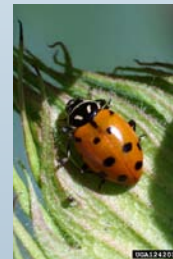
- Canola should be scouted biweekly for aphids.
- Treat for aphids when populations exceed:
 - 2 per plant in the seedling stage
 - 5 per leaf in the rosette stage
 - or when 20 percent of the heads are infested during bloom.

Cabbage Aphid

4) Management Options:

Biological Control:

- Several natural enemies help to regulate aphid populations. The most important are a parasitic wasp and predatory ladybird beetle larvae and adults.



Chemical control:

- A number of insecticides are available for control of aphids
- Do not treat late-blooming canola for aphids because populations usually decline after bloom.

Lygus bug (Tarnished Plant Bug)

1) Pest Description:

- Adult are approximately 3 mm wide and 6 mm long, oval, colored pale green to reddish brown or black. They can be solid shaded or mottled, and have a distinctive triangle or V-shape on their backs.
- Larger nymphs have black dots on thorax and back abdomen.



Lygus bug (Tarnished Plant Bug)

2) Damage/Symptoms:

- Adult bugs feed on developing buds, flowers, and seedpods resulting in distortion and abortion of seed pods (blasting). Yield losses of up to 20% have been observed.
- Greatest damage occurs between June and August.



Adult feeding on developing bud



Puncture Points from Lygus Bug Feeding on Canola Stem

Lygus bug (Tarnished Plant Bug)

3) Monitoring:

- Start scouting fields at the bud stage.
- Sample (sweep net) when the temperature is above 20° C and the crop canopy is dry.
- Take 10, 180 degree sweeps through the bud area
- Count adult lygus numbers per 10 sweeps

Lygus bug (Tarnished Plant Bug)

4) Thresholds/Management:

- Treat for lygus bugs if counts are 15 Lygus bugs per 10 sweeps from bud stage through petal drop, and 20 lygus bugs per 10 sweeps after petal drop



- Once the seeds have ripened to yellow or brown, the cost of controlling lygus bugs may exceed the damage they will cause prior to harvest, so insecticide application is not warranted.

Lygus bug (Tarnished Plant Bug)

5) Management Options:

Biological:

Lygus bugs have several natural control agents. A tiny fairy wasp, in the family Mymaridae, parasitizes the eggs of the lygus bug. In western Canada, a parasitic wasp, *Peristenus pallipes*, attacks lygus nymphs in alfalfa but is less effective in canola. Nabid plant bugs, bigeyed bugs and spiders occasionally prey on young lygus bug nymphs.

Chemical:

There are several registered Insecticides like (Imidacloprid or Bifenthrin) that can be used once populations have reached economic threshold levels.

Additional Canola Insect Pests

- Bertha Armyworm
- Beet webworm
- Diamondback moth
- Painted Lady, Thistle Butterfly
- Red Turnip Beetle
- Root Maggots
- Cabbageworms
- Clover Cutworm
- Alfalfa looper

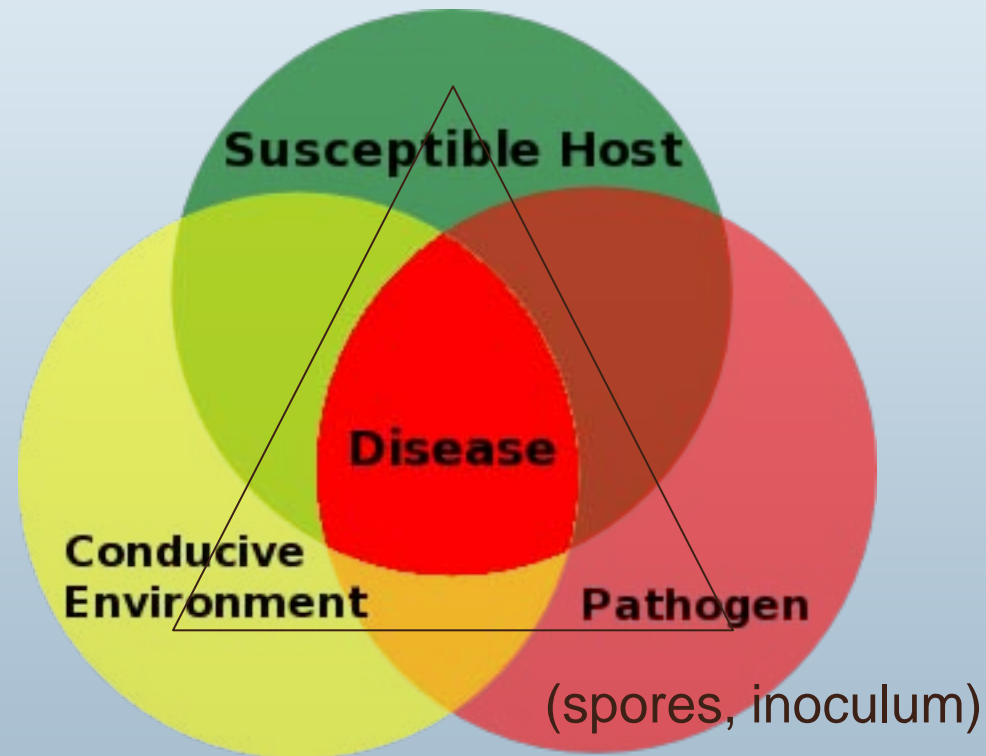
Pests of Canola Cont...

2) Plant Pathogens:

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Plant Disease Triangle



Blackleg (Stem Canker)

1) What is it?:

- Blackleg is caused by the fungus *Leptosphaeria maculans*. It is a serious disease of canola and causes significant yield losses in susceptible varieties. This fungus can attack leaves, stems and pods, causing stem cankers, girdling and lodging.



- Before the widespread adoption of moderately resistant to resistant varieties (1990's) this disease caused over \$500,000,000 in losses to Saskatchewan canola growers.

Blackleg (Stem Canker)

2) Appearance/Symptoms:

- Pale, irregular spots on leaves later become ashy gray with scattered black dots on the surface.



- Stem lesions are elongated with purple borders near the soil line and extend below the soil surface, causing a black rot of lower stem and roots.



Blackleg (Stem Canker)

3) Damage Indicators/Symptoms:

- Severely affected plants are stunted, wilt, and turn a dull blue-red color.



- As plants mature, they fall sideways from lack of root anchorage and can result in high yield losses.
- If infected seeds are planted, seedlings may be killed shortly after emergence, resembling damping-off.

Blackleg (Stem Canker)

4) Management Options:

- **Cultural control:** Resistant canola varieties are available
- Use certified pathogen-seed.
- Eradicate susceptible plant hosts (canola volunteers and weeds like wild mustard).
- Remove plant debris or bury by deep-plowing.
- Do not plant adjacent to fields where infected crops have been during the previous three years.
- **Chemical control:** Fungicide seed treatments or Foliar treatments such as: Quadris Flowable at 6 to 15.5 fl oz/A.

Damping-off and Seed Rot

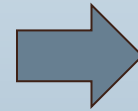
1) What is it?:

- Damping-off can be caused by *Pythium* spp., *Fusarium* spp., *Rhizoctonia solani*, *Alternaria* spp., and other fungi. These soilborne pathogens attack young seedlings of many vegetables including members of the genus Brassica, as well as cause root rot of more mature plants.
- If seedlings are affected before emergence, it appears as poor germination.
- If the decay is after emergence, seedlings that fall over or die are said to “damp-off.” The destructiveness of this disease depends on the level of pathogens in the soil and on environmental conditions. Wet, cool soils are especially favorable for the development of damping-off.

Damping-off and Seed Rot

2) Appearance/Symptoms:

- Young seedlings develop a sunken, necrotic lesion near the soil line.



Damping-off and Seed Rot

3) Damage:

- Seeds may not germinate resulting in poor stand establishment



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Damping-off and Seed Rot

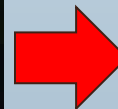
4) Management Options:

- **Cultural control:** Do not sow seeds deeply and sow into warm soils.
- Remove or encourage decomposition of plant debris.
- **Chemical control:** Treat seeds with one of the following fungicides. Allegiance-FL at 0.25 to 0.50 fl oz/100 lb seed. Controls *Pythium* spp. only.
- Captan 400 at 1 to 2 fl oz/100 lb. (Controls a broad spectrum of fungi.)
- 42-S Thiram at 6.4 fl oz/100 lb seed.

Sclerotinia (Stem Rot)

1) What is it?:

- Sclerotinia stem rot is caused by the fungus *Sclerotinia sclerotiorum*. The disease is sporadic, occurring when environmental conditions are favorable for infection. Prolonged humid (wet) conditions during the flowering period favor disease development.



(Apothecia) Tiny mushroom-like bodies produce millions of airborne spores.

Sclerotinia (Stem Rot)

2) Appearance/Symptoms:

- Premature ripening of plants
- Stems bleached and tend to shred (Fig. 1)
- Diseased tissues eventually bleach white, are diagnostic.
- Hard black sclerotia inside stems near base of stalk and other bleached areas (Fig. 2)
- Affected plants may be more erect due to lack of pod fill.



Fig 1.



Fig 2.

Sclerotinia (Stem Rot)

3) Damage:

- Smaller and fewer seeds
- Premature ripening
- Shattered pods
- Loss of smaller, shrunken seeds during combining
- Stem infections can cause wilting and plant death



Scouting for Sclerotinia (Stem Rot)

When scouting for apothecia, the tiny mushroom-like structures that release infectious ascospores, keep two things in mind:

- Make sure what you see are apothecia. They are tan or honey-coloured, 5 to 15 mm across, and tops are cupped like a golf tee. They will be growing from sclerotia in the soil or decaying canola.



- When scouting for apothecia, check low spots in cereals that were in canola the previous year. If low spots are still water-logged, look in areas that have been wet but not saturated.

Sclerotinia (Stem Rot)

4) Management Options:

- **Cultural control:** Rotate using non-susceptible crops such as grass or grains.

- Encourage maximum air movement between rows.

- **Chemical control:** According to research in North Dakota, fungicide applications for Sclerotinia control in canola are economic only when Sclerotinia has been a problem in the area, rainy/humid weather is expected to continue

- Endura at 5 to 6 oz/A at 20-50% flowering.

- Ronilan EG as a single application at 10.6 to 16 oz/A at 20 to 50 % flowering

Sclerotinia (Stem Rot) Checklist

With good moisture and high humidity, growers with canola at early flower should use the following checklist (Fig 1) to assess their sclerotinia stem rot risk. Fields scoring 40 or higher could benefit from fungicide, depending on canola price, yield outlook and fungicide cost.

Sclerotinia Stem Rot Checklist

(For each risk factor, circle the risk points that apply to your field.)

RISK FACTOR	POSSIBLE ANSWERS	RISK POINTS
NUMBER OF YEARS SINCE LAST CANOLA CROP	More than six years	0
	Three to six years	5
	One to two years	10
DISEASE INCIDENCE IN LAST HOST CROP	None	0
	Low (1 to 10%)	5
	Moderate (11 to 30%)	10
	High (31 to 100%)	15
CROP DENSITY	Low	0
	Normal	5
	High	10
RAIN IN THE LAST TWO WEEKS	Less than 10 mm (0.4")	0
	10 to 30 mm (0.4 to 1.2")	5
	More than 30 mm (1.2")	10
WEATHER FORECAST	High pressure	0
	Variable	10
	Low pressure	15
REGIONAL RISK FOR APOTHECIA DEVELOPMENT	None found	0
	Low numbers	10
	High numbers	15

TOTAL RISK POINTS FOR ALL RISK FACTORS =

(Fig 1)

Alternaria (Black Spot)

1) What is it?:

- The fungi, *Alternaria brassicae* and *A. raphani*, which survive in infected plant debris and can affect all stages of canola growth and all above-ground parts of the canola plant.
- The disease also is known as gray leaf spot, pod drop, and dark leaf spot.

Alternaria (Black Spot)

2) Appearance/Symptoms:

- Black, brown or greyish spots on leaves, stems and pods



Alternaria (Black Spot)

3) Damage:

- Very widespread in canola growing areas
- Can be severe if moist conditions occur during podding
- Severe early infections may kill plants (Fig.1)
- Severe infections at ripening may cause yield loss



Fig. 1 Dead canola plants

Alternaria (Black Spot)

4) Management Options:

- **Cultural control:** Rotate using non-susceptible crops such as grass or grains.
- Encourage maximum air movement between rows.
- Variety selection, *Brassica. napus* varieties which are less susceptible than *B. rapa*. *B. napus* varieties have more leaf wax which provides more tolerance to black spot disease.
- **Chemical control:** Protective fungicides are registered for canola and should be applied at the initiation of flowering, prior to disease development.

Additional Canola Diseases

- Gray Mold
- Clubroot
- Root Rot
- Bacterial Black Rot
- Aster Yellows (carried by leaf hoppers)



Thank You

Helping You Put Knowledge to Work

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