

ONTARIO SPRING CANOLA



GROWING GUIDE

This booklet brings together information from various sources to serve as a guide for growing spring canola in Ontario. Information sources included OCGA newsletter articles, the Canola Council of Canada Growers Manual, and the OMAFRA Agronomy Guide for Field Crops.

Article authors include:
Brian Hall, OMAFRA Canola Specialist,
Tracey Baute, OMAFRA Field Crop Entomologist,
Brian Wiley, 2007 Crop Production Centre Chair.
Shawn Shill, Shawridge Farms

Ontario Canola Growers Email Alerts

As part of our commitment to share important and timely information with canola producers, OCGA offers an email alert system that provides up-to-date canola crop information throughout the growing season.

As conditions and pest problems arise, we will let you know about them, as well as recommended treatments.

Agronomists situated throughout the province provide information for this email alert service.

If you would like to receive our canola email alerts please call our office at 519-763-1200



Ontario Canola Growers Website www.ontariocanologrowers.ca

Throughout the growing season, this website will help you with the identification of crop conditions, diseases, pest thresholds and recommended treatments to watch for in your area.

Visit our website often to keep up-to-date on current crop conditions.

The information in this booklet is posted on our website.

Canola Council of Canada Website

For extensive information on growing canola, canola's health benefits, use of canola meal and more visit the Canola Council of Canada website at www.canola-council.org

Ontario Canola Growers Association
Ontario AgriCentre, 100 Stone Rd W, Suite 201, Guelph, ON, N1G 5L3
Phone: 519-763-1200
Email: info@ontariocanologrowers.ca Website: www.ontariocanologrowers.ca

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Planning Your Canola Crop – Rotation

Canola offers several advantages as a partner in a crop rotation.

- **Allows for timely planting of winter wheat.** Some growers report their best stands of winter wheat following canola.
- **Canola is harvested earlier,** which helps to spread out a grower's workload and helps with cash flow.
- **Allows for timely manure application** following canola harvest,, thereby avoiding concerns with fall compaction and establishment of a cover crop.
- **Canola is responsive to manure application.** A one tonne/acre canola crop will remove 90 – 100 lb nitrogen, 50 lb phosphorus, 25 lb potash, 5 lb sulphur. Canola is an excellent fit in many nutrient management plans.
- **Excellent weed control options** with Liberty Link, Roundup Ready, Pursuit Tolerant as well as conventional varieties. Canola is also a strong competitor with weeds once it bolts.
- **Disease break:** Canola is an ideal rotational crop to provide a disease break following corn or cereal crops. Studies have also shown that decaying canola roots have a 'fumigating' action killing fungal inoculums in the soil from diseases such as cereal take-all and root rots.
- **Beneficial effects on soil structure.** The large canola taproot provides channels that improve the rate of water infiltration and may provide a route for roots of following crops into the subsoil.
- **Canola residues break down easily** allowing subsequent crops to be no-tilled.

Canola is recommended in a four year rotation.

Do not plant canola directly after other broad leaf crops such as flax, mustard, soybeans, and sunflowers as they are susceptible to the same insects and diseases, such as white mould (sclerotinia).

Growers have reported canola following corn shows good results but we recommend growers check herbicide residue carry over, as canola can be susceptible to certain herbicide residues. (see Schill, page 13).

It is important to be aware of residual herbicides used in the previous crop.

Examples include Atrazine, Pursuit, Cleansweep, Conquest, Firstrate, Meridian Plus.

Consult OMAFRA Guide to Weed Control for more details.

Planning Your Canola Crop – Fertility Program

The fall is a good time to look at your soil's P and K levels and possibly apply fertilizer to make it available for next year's canola crop. Don't ignore the nitrogen value of fall applied manure.

Soil test before you invest! Build a precision fertility program for each canola field by soil testing, and potentially save fertilizer dollars. Fertilizer recommendations should be based on yield goal, soil tests, and if the land is owned or rented (ordinarily only 15 to 20% of the applied P is taken up by plants in application year).

Canola has a high demand for nitrogen.

The recommended nitrogen rate for canola is 90 – 100 lbs/ac (100- 110 kg/ha).

Where manure is applied, reduce the fertilizer according to the amount and quality of manure. Rates should be also be adjusted downward if the previous crop contained legumes such as alfalfa.

Starter Fertilizer

Banding of starter fertilizer should only be considered on soils testing low for phosphorus or with very early seeding. Canola is very sensitive to salt injury from fertilizer placed with the seed.

Select a starter low in nitrogen and potash to avoid salt injury (example 11-52-0 MAP). Only 10 - 30% of applied fertilizer P is taken up in the year it is applied.

The recommended maximum rate of phosphorus fertilizer with the seed is 18 lb/ac. On low testing soils, apply 18- 30 lb/ac phosphorous. Crops planted under early, cool conditions benefit the most from starter applied P.

Nitrogen (except as MAP) and potash should be broadcast, not applied with the seed.

Sulphur with Fertilizer Application

Canola requires approximately twice the amount of sulphur that cereal crops do. Deficiency is most likely to appear in a dry year, on coarse soil types, and where high N rates are used.

Apply **20 – 30 lbs/ac (23-34 kg/ha) of sulphur** as 'insurance' against deficiency. A least cost approach for providing sulphur is to replace part of the spring urea application with ammonium sulphate (21-0-0-24). Replacing 50 pounds (22.7 kg) of urea with 100 pounds (45.4 kg) of ammonium sulfate will supply the same amount of nitrogen and 24 lbs (10.9 kg) of sulphate -S. Broadcasting is as effective as through the drill. Ammonium thiosulphate (liquid 12-0-0-26S) is another common source of sulphate-S.

Canola Challenge Winner, Jon Wiley's Formula— *To get the recommended 100 lbs of N – Jon bulk spread 150 lbs of ammonium sulphate (30 lbs actual N) and 150 lbs urea (70 lbs actual N). By adding that amount of ammonium sulphate he also added 36 pounds of sulphur to his fertilizer. Previous experience had taught him that although canola requires high amounts of N, it also needs a proper balance between nitrogen and sulphur. See page 19 for more details.*

Planning Your Canola Crop – Variety & Herbicide Choices

- Today's hybrids are much improved in yield and tolerance, with the top canola hybrids consistently producing closely competitive yields. This was illustrated by the 2007 Crop Production Centre Showcase Varieties (results below), which were planted to show growers the different varieties and how they performed side by side.
- Select strong varieties that suit your herbicide rotation and management system.
- For further yield comparisons, please review the 2007 OOPSC Trial Results, page 20.



2007 Crop Production Centre Showcase Varieties Results

Company	Variety	Yield lbs./acre	Moisture	Yield Adj to 10%	Rank
DEKALB - RR	71-45	3071	9	3101	1
Pioneer - RR	45H26	2994	9.1	3020	2
Invigor - LL	5440	3025	11.8	2971	3
Pioneer - RR	45H21	2929	9.7	2937	4
Pioneer - RR	45H26	2916	9.8	2921	5
Invigor - LL	5030	2865	10.1	2862	6

It should be noted that there were no check strips used in this comparison, as this was not considered an official yield ranking demonstration.

However all varieties were weighed and sampled at harvest to show the growers how the different canola varieties performed.

- *The plots were planted May 4, with the exception of Invigor 5440, which was planted 2 weeks later on May 15 because of problems accessing seed, thus the higher moisture of that variety at harvest.*
- *All plots were harvested on August 28, 2007 using a JD 25' flex head.*
- *Total area of each plot was 3 acres, area combined for yield was slightly less than .5 acre.*

Planting Your Canola Crop

Because of the wide geography over which canola is grown, the seeding date can vary greatly from mid April until late May.

The ideal temperature for rapid germination and emergence is 10⁰C. Begin seeding when soil temperatures are 5⁰ C or higher.

Don't let soil compaction squeeze your profits. Roots care about how deep they go. Most soil compaction and damage is done by the first trip over the field in the spring. The push to plant more acres and seed earlier can entice you to go into fields where soils are marginally fit and compact the most. Yield losses of 15% to over 30% have been documented. Check soil conditions at tillage depth. Soil should crumble easily and not form a ball or ribbon when rolled in your hand.

A good seedbed is one of the most important factors for high yields. Packing before seeding can help to level and firm the seedbed, improving seeding depth control and reducing soil moisture loss. Packing after planting as well, generally improves emergence and yield, particularly if the soil may dry out before emergence. Soils should be firm enough that heel marks are no deeper than the sole of a workboot.

Broadcasting the seed followed by harrowing and packing has given satisfactory results but has the disadvantage of uneven seeding depth.

Canola can be no tilled successfully, although at our 2007 Crop Production Centre site we showed a yield advantage by using conventional tillage. It should be noted that:

- the no til planting was planted using a John Deere 750 no til drill and other drills (ie those with coulters caddies) might perform differently,
- the results from our 2003 and 04 CPC sites showed a boost in yields with no til.

Seeding rates: Recommended seeding rate is 3.5 to 5 pounds of seed per acre.

Seeding rates are usually given in lb/acre, but a preferred method is to begin with the desired final plant stand. The optimum plant stand is 7 – 10 healthy plants/sq foot. In 7.5 inch (19.5 cm) rows this is equivalent to 4.5 to 6 plants per foot (14.8 – 19.7 per m) of row. Target seeding rates need to account for large differences in seed size between varieties.

Starter fertilizer ...see Page 5 for recommendations.

Calibrate seeding equipment before heading to the field! On some drills a half speed sprocket can be installed to obtain the desired seeding rate. Another option is to mix seed with MAP (11-52-0), pelletized sulphur, or corn cob grits. Other fertilizers should not be used. Seeding through the grass seed box with the seed tubes inserted into the disc openers is another option. Set each seed cup to deliver the same amount of seed.

Seed 1/2" to 1" deep into a firm and slightly cloddy seedbed, keeping moisture near the surface. Deeper seeding reduces emergence and vigour, decreases seedling and root growth, and increases risk of crusting. A constant moisture supply is required for germination. If moisture is more than five cm (2 inches) deep, it is advisable to wait for moisture. Avoid having the seed start to germinate and run out of moisture.

Growing Your Canola Crop – Emergence Stage



Cotyledon Stage

Two Leaf Stage

Four Leaf Stage

Canola is slightly less tolerant to spring frost and slower to establish than cereal crops. When seedlings emerge, the growing point is between the cotyledon leaves. Canola seedlings can recover from a frost that damages leaves, provided the growing point remains undamaged.

Flea Beetle



After emergence of the crop watch very carefully for flea beetle pressure. Even though the canola plant can recover from early insect damage, yield can be severely effected.

Seed treatments typically provide 2 to 3 weeks protection following planting, but high flea beetle populations or slow seedling development might warrant a foliar insecticide treatment. You should be aware of the expected longevity of the seed treatment used on your seed, as it varies.

Once the crop gets to the 3 to 4 leaf stage the crop can withstand flea beetle effects.

Weed Control

It is critical to control weeds early. Optimum timing for weed control is the 2 to 4 leaf stage and weed pressure should be kept at a minimum up to the four-to-six leaf stage.

Allowing significant early weed pressure to build will result in yield losses. Once canola is established it is a strong competitor with weeds.

Spray weeds early for higher yields! Trials have shown a 10% yield improvement (i.e. \$59.00/acre @ \$650/t canola price) by spraying at 1-2 leaf stage versus the 5-leaf stage. Concentrate on controlling weeds that emerge with the canola, and less on weeds that come up after the 4-6 leaf stage.

Most growers treat once for weeds, although occasionally a second treatment is required.

Talk to your agronomist for advice on the best herbicide and weed control program for you.

Refer to OMAFRA Publication 75, Guide to Weed Control, for more information including herbicide products and rates.

Growing Your Canola Crop – Rosette & Bud Stage



A rosette of leaves forms, with older leaves at the base increasing in size and smaller younger leaves developing in the centre. Leaf area development is directly related to growth rate and final yield.

Some growers have had good success with application of a foliar fertilizer at this point and report a significant increase in root mass and leaf area, which both support grain production. (see Schill article, page 14). A large root mass and healthy leaf growth will also help the canola plant better withstand a lack of moisture or drought period and insect pressure.

Lengthening days and rising temperatures trigger bud formation in the centre of the rosette, which rises as the stem rapidly "bolts." The main stem reaches 30%-60% of its final height at the start of flowering. A large leaf area (especially upper leaves) at this stage strongly influences pod set and final yield.



Flea Beetle

Diamond Back Moth

Cabbage Seedpod Weevil

Tarnished Plant Bug or Lygus Bug

Alternaria Leaf Damage

Sclerotinia Stem Damage

Scouting Calendar

	Emergence to 4 Leaf Stage	Rosette to Bud Stage	Flowering	Pod Fill Stage	Maturity
Flea Beetles					
Diamond Back Moth					
Swede Midge					
Cabbage Seedpod Weevil					
Tarnished Plant Bug					
Sclerotinia (White Mould)					
Alternaria (Black Spot)					

For more information on these canola pests and diseases, please refer to articles on pages 17 to 19 or the Canola Council of Canada website at www.canola-council.org.

Growing Your Canola Crop – Flowering Stage



Flower Stage

Flowering begins with the opening of the lowest bud on the main stem and continues upward on both main and secondary branches.

Flowering continues for about 14 to 21 days. The maximum plant height is reached at peak flowering.

High temperatures or very dry weather during flowering can cause flower blasting and pod abortion and sustained high temperatures can lead to rown seed problems.

Flowering is a critical time and it is important to scout your fields throughout flowering and treat if needed for:

- **Sclerotinia**
- **Cabbage Seedpod Weevil and Tarnished Plant (Lygus) Bug,**

When combining treatment products, check the product label for instructions and compatibility issues.



Cabbage Seedpod Weevil

Sclerotinia (White Mould)

Sclerotinia is a fungal disease that can reduce yield by 20 to 30%. Yield and quality losses are greater when infection occurs early. Quality is affected from sclerotia (mouse like droppings) in seed.

Sclerotinia is a concern particularly if soybeans are part of the rotation. Avoid planting canola following soybeans or edible beans because they are also susceptible to white mould.



Sclerotinia Stem Damage



Sclerotinia Pod Damage

With the introduction of new treatments, some growers apply treatments as a matter of course and report a yield increase (see Schill article, page 14).

Provincial recommendations are to treat for sclerotinia when wet and humid conditions indicate a high risk of infection, however the fungicide must be applied **before** symptoms appear. The risk of infection is increased when the crop is dense, temperatures are moderate and rainfall occurs during flowering.

Apply fungicide treatment at flowering stage.

Growing Your Canola Crop – Flowering Stage

Alternaria (Black Spot)

Alternaria can reduce yield by over 50%. The greatest yield loss occurs when alternaria infects pods causing pod shattering.



Alternaria Pod Damage



Infection can occur at any growth stage, and reaches its maximum intensity in ripening plants.

Humid conditions and moderate temperatures favour the disease and rainy, and windy conditions when the canopy remains wet over long periods promotes spread of the disease.

Scouting: Check fields during flowering to green pod stage for signs of infection indicated by brown to black spots on leaves, stems and pods.

Treatment with fungicide is recommended at late flowering to early green pod stage.

Ask your agronomist for information about new products on the market to control alternaria.

Micronutrient Foliar Treatments

Trials with foliar application of liquid boron as a nutrient have indicated stronger flower and seed set. Boron is more responsive in dry conditions but care must be taken as boron can become toxic if over applied.

Growing Your Canola Crop – Ripening Stage

Ripening Stage

About 30 to 40 days after flower opening, the seedpod has filled.

As canola seed matures it turns from green to yellow and then to a dark brown.

Canola pods ripen from the bottom to top of the plant.

Scout your canola fields during pod fill for late season pests – Tarnished Plant Bugs can be a problem at this time (see Baute article, page 18).



Ripening Canola Plant



Mature Canola

Harvesting Your Canola Crop

Straight Combining or Direct Harvest Method

Direct combining allows the pod to fill as long as possible—increasing seed size, weight and oil content.

Canola is ripe when the pods rattle when shaken.

Generally start harvesting as close to physical maturity of the plant as possible. After this point, a crop is at risk of shelling or weather damage (see Schill article, page 14).



Canola can be rejected if moisture content exceeds 10%. However, many growers feel they can push these limits by starting earlier in the morning, as moisture can drop quickly as the day progresses, resulting in a composite sample of less than 10% moisture.

Approximately 75% of the Ontario crop is straight combined.

Swathing

Swathing at the correct stage of maturity reduces green seed and seed losses from shattering. The colour of the seed is more important than the overall colour of the field. The optimum time to swath is when



30%-40% of the seeds in pods on the main stem have changed to red or brown. The pods at the bottom of a canola plant ripen first, therefore the pods at top may still be greenish when the field is ready for harvest. On larger acreages, if swathing is started at 25% colour change, then the majority of acres can be swathed at near optimum maturity. Seed colour can quickly go from 10% to near 50% in a few days, under hot, dry weather.¹

Under hot (30°C or 86°F), dry conditions, swathing is not recommended. Swathing in the morning or evening results in slower plant dry-down.¹

Canola ripens and dries quickly in the swath. Usually 5-10 days of good drying weather will lower the moisture content to a point where the seeds in the upper pods of the plants are firm. Canola seed can drop by 1% moisture or more per hour in the swath. Many operators start combining when the seed is slightly above 10% moisture.¹

A Canola Success Story – Shawn Schill

Shawn Schill and his family operate a successful cash crop operation near Arthur, Ontario and contributed the following article... “When trying to reach maximum canola yield there are a number of things we have found to be important and that producers should note.”



1. Planning your next crop always starts the year before. We generally follow a corn crop with canola and use as little residual chemicals as possible on the corn, so we have no carry over into the canola crop that can cause damage. The fall is also a good time to look at your soils p and k levels and possibly apply fertilizer to make it available for the canola crop.

2. The most important day of your canola crop is the day you plant it. We find the best calendar day to plant your canola is the day the soil temperature is warm enough to promote quick emergence. Whether it is the 20th of April or the 20th of May, soil conditions are more important than planting date. We look for around 8-10 degree Celsius soil that is dry and firm. If there has been no fall tillage done we either do a pass with our vertical tillage tool or if the conditions are optimal no-till directly without tillage. Keeping a firm seedbed will help in

With the canola management practices we've adopted in our operation, we were able to achieve a 2588 lb/acre average in 2007

depth control when planting. If we cultivate the soil and have a lot of loose ground we will pack the soil with a large steel roller prior to planting. This is also the time to apply nitrogen. We generally use 100-125 units of N applied with 32% UAN that is incorporated. Due to the close relationship of nitrogen and sulphur when we decide to increase our nitrogen rates to achieve high yields, we also increase sulphur rates as well.

3. Today's hybrids are so

improved over earlier hybrids. It is very important to select strong varieties that suit your management style. We generally plant an Invigor variety as the Liberty Link system fits our herbicide rotation and management system better. We plant around 4.5 – 5.0 pounds of seed an acre. We always use a granular banded starter fertilizer and have been using a new homogenized started called MESZ from Mosaic Ltd. This product is basically MAP with sulphur and zinc layered onto every granule of fertilizer, which ensures that you have equal amounts of every nutrient consistently in the band instead of scattered like a blended fertilizer. The starter analysis we apply with our seed is 8-26.4-20.4(6.6S) (.65 ZN). Canola can be sensitive to banded starter and what works in one soil

A Canola Success Story – Shawn Schill—*continued*

type will cause damage in another so producers must be aware of their soil types and chose starter accordingly.

4. After emergence of the crop we watch very carefully for any flea beetle pressure. Even though canola can repair itself from early insect damage, it has used a lot of energy in this repairing instead of building root and leaf area, which are the building blocks to successful yields. Weed pressure should be kept at a minimum as well. It sometimes seems more economical to wait and try to control weeds in a single pass, but letting any significant weed pressure build is a sure way to have yield losses. We will do an application of foliar fertilizer with our weed spray, if the crop shows signs that it would benefit from it.
5. The rosette or pre-bolt stage is when we do our second foliar feeding. We use a combination of several foliar products. The misconception of foliar fertilizers is to provide more nutrients for grain production. This application is for nothing more than increasing root mass and leaf area, which are the main components in grain production. In some fields we have seen a root mass increase of almost 50% and always see an increase in leaf area from this foliar

application. This is also a good time to scout for flea beetles and especially Swede Midge and do a control, if warranted.

6. Flowering is a very crucial time and we have come to the conclusion that it is economical most years to do a fungicide application. 2007 was very dry, which would suggest that sclerotinia should *not* have been a problem, yet we saw a 298 lb/acre increase after an application of Pro-line. With soybeans and canola in a four-year rotation, I believe it is not a case of *if* you will have infection, but *how bad* will the infection be? So we have made it common practice to do a fungicide application at flower as well as a foliar application of liquid boron that promotes stronger flower and seed set. Boron becomes more crucial in drier or drought conditions but an over-application can become toxic so care has to be taken with boron. Flowering is also an important time to scout for Cabbage SeedPod Weevil and do a control if warranted.
7. Our harvest is done by the straight combining method We feel this allows the plant to seed fill as long as it possibly can – increasing seed size and bushel weight. We will generally start

harvesting at 13% moisture and generally as close to physical maturity of the plant as possible. Once the plant has physically matured nothing good can happen to it in the field anymore, so the quicker you get it off, the less risk you have of shelling or weather damage. Looking at today's market, a 5% shelling loss on a 2500 lb/acre crop would cost \$26/acre. A 5% shelling loss is not very visually noticeable.

8. Because of the canola management practices we've adopted in our operation, we were able to achieve a 2588 lb/acre average in 2007 and in particular we had a 134 acre farm that averaged 3279 lbs/acre.

As we fine tune our management skills I believe that 3000+ lbs/acre crop averages can and will be achieved.

We as producers can only protect and enhance a portion of a crop's potential, the rest is up to nature and the environmental components it provides.

Having a strong and healthy canola plant will better enable it to handle environmental stresses and reach its best potential—no matter what the conditions.

Getting More Bank From Your Input Dollar by Brian Hall, Canola Specialist, OMAFRA

In this era of complex agriculture, there are an incredible amount of choices to select from to reduce the guesswork in crop production and improve the odds of maximizing overall returns.

Knowing there is no single recipe for all fields or situations, the following is my list of the inputs that have the biggest impact on yield of canola.

Plant Genetics

The latest Ontario canola performance trials provide clear proof that hybrid canola varieties are yielding 30-40% more than older open pollinated types. The two highest yielding hybrids in this year's trials were 5030 LL (Bayer Crop Science) and 45H26 RR (Pioneer Hybrid), which yielded 36% and 20% above the hybrid check cultivar 45H21. Invigor 5030 LL is a Liberty Link variety that has the highest two year average yield.

Variety selection should also consider lodging, herbicide system for weed problems in the field, disease resistance and brown seed count. Brown seed is linked to high free fatty acids which caused problems with canola oil quality in 2005.

Timing of Weed Control

Aim to control weeds by the 4th leaf stage. Weeds which emerge with canola compete for light, moisture, nutrients



and have the greatest impact on yield. Delaying application until after the 4th leaf stage results in more than a 10% loss in yield on average, which equates to a \$50 /acre loss in income (i.e. 2000 lb/ac and \$550/t canola price)

Controlling weeds when they are small and actively growing often allows for lower rates of herbicide to be use.

Fertility

Banding of starter fertilizer should only be considered on soils testing low for phosphorus or with very early seeding. Canola is very sensitive to salt injury from fertilizer placed with the seed. Select a starter low in nitrogen and potash to avoid salt injury (example 11-52-0 MAP). Only 10 - 30% of applied fertilizer P is taken up in the year it is applied.

Boron deficiency in canola is very rare. Extensive research trials have shown a neutral or negative response to boron

either broadcasted or applied as foliar. There is fine line between deficiency and toxicity. Boron availability is reduced on high pH and sandy soils. There is no Ontario recommendation for foliar boron. In Western Canada, where deficiencies have occurred the recommendation for foliar application is to not exceed 0.3 kg/ha (0.3 lb/ac) of actual boron to reduce the risk of toxicity. The suggested water volume is 20 – 30 US Gal/ac. Application can be made up to early flowering for greatest effectiveness. For more information on boron, deficiency symptoms (i.e. good pictures) refer to the Canada Canola Council link at www.canola-council.org/boron.aspx

Sulphur – If sulphur is a concern, apply 20 -25 lbs/ac sulphur as ammonium sulphate for “insurance.” Deficiency is most likely to appear in a dry year, on coarse soil types, and where high N rates are used (i.e. winter canola).

Getting More Bank From Your Input Dollar

continued

Nitrogen requirements

- Spring canola (2300 HUs or less) – 117 lbs/ac
- Spring Canola (more than 2300 HUs) – 90 lbs/ac
- Winter Canola – 1 t/ac expected yield – 160 lbs/ac (spring).

Scouting

Scouting is as important as other inputs.

- Scouting helps protect your crop yield, and lets you sleep at night.
- Scouting is to *identify* and *decide* if the problem is big enough to warrant the cost.
- Scouting must be *timely*.

Insects

Flea Beetles need to be monitored following emergence until the 4th leaf stage. Seed treatments may not provide adequate control if populations are high or canola development is delayed.

Tarnished Plant Bugs. Higher populations of tarnished plant bugs in recent years have raised concern of economic losses from the insect. In 2005, at the Ontario Canola Production Centre, the control treatment produced over 500 lb/ac yield increase under high plant bug pressure. Annual yield losses in Western Canada have been estimated at 10 to 35% in infested areas. To best protect yield and quality,

monitor and control at the early pod-ripening stage. Typical economic threshold is 15 to 20 bugs per 10 sweeps.

Cabbage Seedpod Weevil (CSW). CSW is mainly a problem in winter canola and occasionally early planted spring canola. Using a sweep

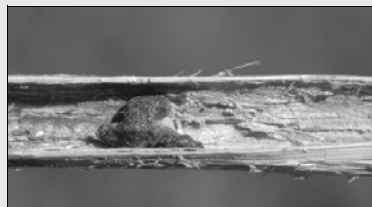


net is the only effective method in deciding on the need to control. Threshold is 3-4 per sweep during early flowering. Matador provides 7-10 day's control. More than one application may be required in winter canola.

Disease Control

Canola is a healthy crop that suffers from very few diseases. Sclerotinia stem rot and occasionally alternaria are the main diseases that reduce yield

Sclerotinia - Apply a fungicide for sclerotinia when soil and weather conditions indicate a high risk of infection and the crop has good yield potential. Yield losses of 20 to 30% or more can occur in some years. Quality can also be affected by the appearance of sclerotia (i.e. mouse like droppings) in the grain sample.



Fungicide application in the absence of the disease has not improved yields. Lance and Ronilan are the two most effective fungicides for sclerotinia. The recommended application timing is from 20% to 50% flower, but this should be fine tuned to when the risk is the greatest. In some years infection at late flower can be as devastating as early infections.

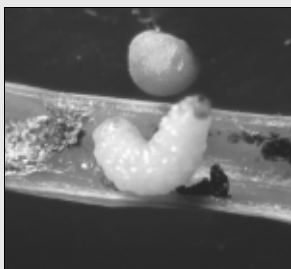
Alternaria - Alternaria (black spot) disease is an occasional problem that infects canola late in the season. Warm moist conditions at podding can cause alternaria to explode through the crop. Pods become brittle, seeds become misshapen and discoloured, and yields drop. The greatest loss from pod infection is from shattering resulting from uneven ripening of infected pods. Alternaria robs the plant of yield by reducing the photosynthetic area of the plant at the critical seed fill stage. In Western Canada, yield losses of up to 25% have occurred in infection outbreaks. Quadris fungicide is registered for control.

Watching Your Spring Canola Through To Harvest

by *Brian Hall, Canola and Edible Beans Specialist, OMAFRA*

Scout your fields for these pests and diseases to protect the yield and quality of your canola crop.

Cabbage Seedpod Weevil



The larvae that hatch from these eggs can consume about 5 canola seeds before chewing an exit hole and dropping to the ground to pupate.



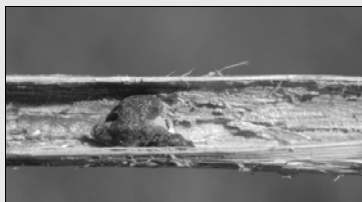
Cabbage seedpod weevils (CSW) are an important economic pest of winter canola, but can also be an issue in spring canola.

Spring canola fields at greatest risk are early planted fields, and in areas where winter canola is co-located. CSW are attracted to canola at flowering, and will move from winter canola into nearby spring canola fields in flower. The current threshold (established for winter canola) is 2 to 3 weevils per sweep when the canola is at 10 to 30 % bloom

stage (2 to 4 days after flowering begins).

Monitoring for cabbage seedpod weevil should begin when flower bud clusters are evident. Scout on warm, sunny days when weevils are more active. Weevil adults are easiest to locate on the uppermost flower bud cluster. The presence of finches in the field is a sign that weevils are also in the field. Matador is the only insecticide registered for control.

Sclerotinia (White Mould)



White mould is a tough disease to control. The key to protecting your canola against this devastating disease is to identify the risk to your crop and apply a fungicide as a preventative treatment.

Factors that increase the risk

Weather drives the decision making process, and it is critical to assess the risk for each field and for correct fungicide timing.

- Good soil moisture in the month leading up to flowering. Soil moisture is required for the over-wintering sclerotia in the soil to germinate and produce spore-releasing mushrooms (apothecia)
- Forecasted moisture and temperature during late vegetative to

flowering. Several days of cool (10 to 25° C), wet and windy conditions just prior to or at flowering are necessary for infection. High humidity or fog *alone* is not enough for initial infection. Free moisture in the canopy allows spores to infect fallen flower petals (food source). Temperatures above 32° C (90 °F) will arrest disease development.

- Heavy crop canopy. A good gauge of conditions favourable for the spread of white mould is when the canopy remains wet mid-morning for several days in a row.
- Fields with history of white mould.

Alternaria

Alternaria (black spot) disease is an occasional problem, as it was in some canola fields in 2004. Alternaria typically infects canola late in the season. Wind blown spores infect leaves, stems and pods under moist conditions. The disease is favoured by a heavy crop and cool (10 to 15C) wet, windy conditions that promote infection and spread. Early infections during pod fill result in infected seeds being killed or damaged. The greatest loss from pod infection is from shattering, resulting from uneven ripening of infected pods. Alternaria robs the plant of yield by reducing the photosynthetic area of the plant at the critical seed fill stage. Yield losses from alternaria have not been documented in Ontario. In Western Canada, yield losses of up to 25% have occurred. Quadris fungicide is registered for control.

Watch Closely for Tarnished Plant Bug by Tracey Baute, Field Crop Entomologist Specialist, OMAFRA



TPB has many hosts ranging from strawberries and alfalfa to edible beans and canola. Since many canola fields are near alfalfa fields, be on the lookout especially when the alfalfa crop is being cut as TPB could move off to look for another host crop.

Watch for TPB by mid-June and through August.

Tarnished plant bug adults are approximately 5 mm in length, yellowish to reddish brown in colour and have a small triangle shape on their back (Fig. 1). The nymph stage doesn't look the same as the adult but is yellowish-green, wingless and lacks the distinctive triangle shape on its back (Fig. 2).

The adults and later stages of nymphs are the more damaging stages. TPB have piercing-sucking mouthparts that they use to pierce the plant tissue and inject saliva that breaks down some of the plant tissue. If injury directly on the buds occurs, buds can turn white and drop off. If injury takes place during the pod stage, scarring, malformation and dimpling or pitting on pods can occur. They can also drill directly into the seed. Yield losses of up to 40% were reported in Western Canada in 1997.

TPB can move very quickly in the canopy so scouting involves using a sweep net. Take 20 sweeps (180 degree arc = 1 sweep) in 5 areas of the canola field. Border rows are apt to have higher populations so ensure that you sweep further into the field to get a good idea of the average number of TPB per sweep. No thresholds have been validated for Ontario though other jurisdictions recommend spraying in canola when 2

bugs per sweep can be found after petal fall but prior to pod



maturity. If the crop is still only flowering, more TPB are required before control is necessary. Western Canada recommends 5 bugs per sweep as a threshold during later bloom before petal drop.

Recommended products are provided in the table below. Follow label precautions, including being aware of days to harvest intervals. Avoid injury to bees by spraying in the evening or early morning when bee activity is low. Notify beekeepers in your area before spraying so that hives can be protected.

Tarnished Plant Bug	Treatment	Per acre	
cyhalothrin-lambda	Matador 120	34 ml	Ground and aerial application. Maximum 3 applications/yr, one of which can be made by air. Tank-mixing with clay-based fungicides is not recommended as these fungicides may affect insecticide efficacy. 7 days to harvest interval.
trichlorfon	Dylox 420	55 m	Do not apply within 21 days to harvest.

Jon Wiley Wins Canola Challenge – His Formula

For the second year in a row Jon Wiley has won the Canola Challenge - a competition in which growers compete for the bragging rights for the highest yielding canola crop in Ontario and a \$1,000 prize. Jon's winning canola crop came in at an impressive and very profitable 3481 lbs per acre.

The Ontario Canola Growers started the Canola Challenge four years ago, as a practical illustration of the yield increases good management of a canola crop can bring. Growers and their supporting agronomists are asked to give a presentation on their cropping practices at the canola Annual Meeting,

Before picking up his \$1,000 prize Wiley and his supporting agronomist, Randy Martin, gave a presentation at OCGA's recent Annual Meeting describing how he grew the crop.

Wiley said the field he chose had previously been in sod and was manured annually with solid cattle manure. The variety he decided on was Invigor 5030 because he wanted to use the Liberty herbicide program on that farm. The field was planted conventionally using a single disk drill, planted in 12-inch rows (he used duct tape to seal off every other run in the seed box). Since he chose Invigor 5030, Wiley used Liberty as an herbicide, which he applied early June. Near the end of June when the crop reached 10% bloom he had a commercial applicator apply insecticides, fungicides and boron all in one pass.

Wiley said he always experiences a yield advantage from the fungicides and boron. He described a University of Guelph test plot on one of his farms that showed a yield advantage of 480 lbs per acre by applying boron as a foliar spray. His agronomist, Martin went on to say that even if boron is in the soil, it isn't always available because of soil and weather conditions, so that the foliar applied boron sometimes has a greater impact on yields.

One thing that Wiley felt was important to the health of this crop was his approach to applying the recommended N. *Jon bulk spread 150 lbs of ammonium sulphate (30 lbs actual N) and 150 lbs urea (70 lbs actual N). By adding that amount of ammonium sulphate he also added 36 pounds of sulphur to his fertilizer. Previous experience had taught him that although canola requires high amounts of N, it also needs a proper balance between nitrogen and sulphur.* With the seed Wiley banded 60 lbs of 11-52-0.

The Ontario Canola Growers and industry sponsors hold both a winter and spring Canola Challenge each year. Growers pre-register within the planting season and work with a supporting agronomist.

