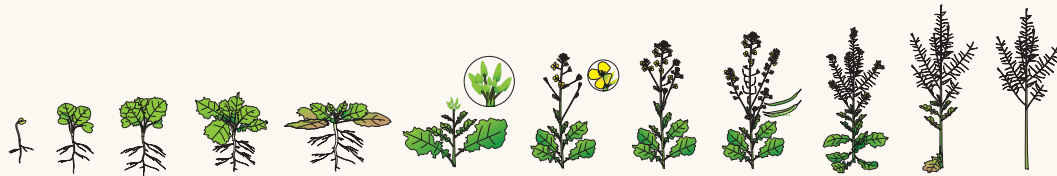


Growing Winter Canola in Ontario



All you need to know about growing a healthy and profitable winter canola crop in Ontario.

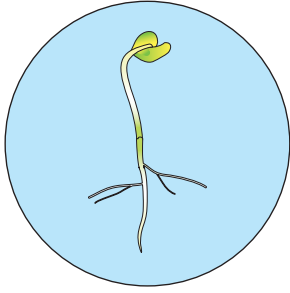


FIELDCROPNEWS



FALL

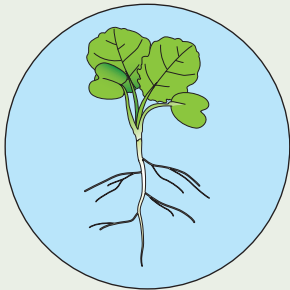
Prepare for Winter Survival



Emergence

The hypocotyl pulls the cotyledons above the soil surface. The growing point is exposed between the two cotyledons.

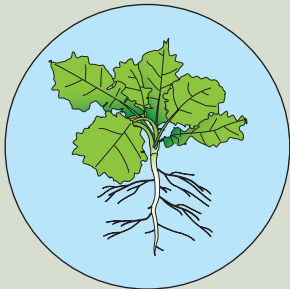
Management: Fertilizer in the seed row can injure seedlings, especially nitrogen and potassium. Apply up to 1/4 of total nutrient requirements pre-plant. Seed 0.5-1 inches deep, or a maximum of 1.5 inches into moisture. Broadcast or shallow seeding in dry conditions results in poor emergence.



Second leaf

Two leaves fully expanded. The rate of leaf expansion is 7-10 days per leaf.

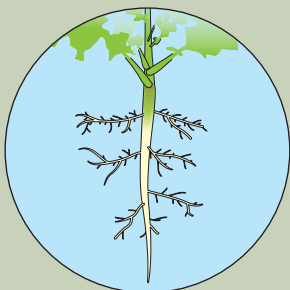
Management: Scout for insect and slug feeding. Canola should be weed free through to the 4-leaf stage.



Sixth leaf

Six leaves fully expanded. Overwintering success is optimized with a minimum of six leaves prior to frost. Rosettes form a total of 9-30 leaves, depending on conditions.

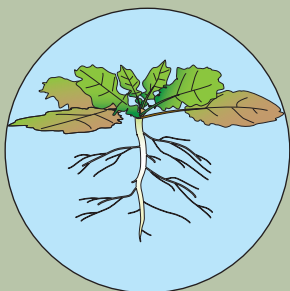
Management: Throughout vegetative growth, scout for diseases such as blackleg and downy mildew. Nutrient and water demand increases until the overwintering stage.



Roots

Canola has a tap root with many lateral, fibrous roots. These roots have a mellowing effect on soil structure. Plants survive on roots throughout the winter. Larger roots in fall improve overwintering success and provide better anchoring to mitigate heaving.

Management: Roots should be the width of a pencil or larger prior to winter. Roots tend to be more robust with earlier planting and lower canola populations.



Overwintering

Canola overwinters in the rosette stage. The stem thickens and freezing tolerance increases. In cold conditions, leaves may turn purple or brown. Where there is abundant vegetative growth in the fall, lower leaves may not survive through winter and spring.

Management: Choose well-drained fields with low clay content for overwintering success. Do not seed canola in fields or regions where winter wheat survival is typically poor.

Plant spacing



Spindly plants with exposed growing points may not survive winter.



Aim for 5-7 plants/ft² to avoid competition between canola plants.

High seeding rates can cause competition between canola plants, resulting in spindly plants and crowns (growing points) raised above the soil surface.

Overwintering success is improved when:

- plants are spaced out
- competition is reduced
- plants are more robust
- crowns are snug to the soil surface and less exposed

Seed at **220,000-350,000 seeds/acre** (approx. 3-4 lb seed/acre). Row spacing should be narrow, up to a **maximum of 15 inches**.

Slugs



Slugs are small and may be difficult to find.



Small plant stems left after slug feeding.

Slugs are abundant in fall and hide in crop residue, and slug feeding at emergence can be misdiagnosed as a seeding or emergence issue.

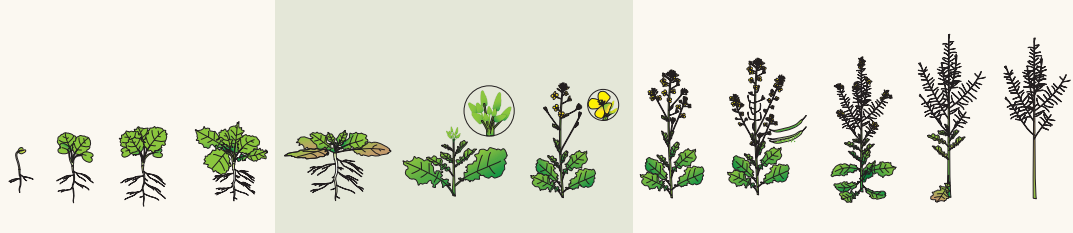
- There are no in-crop options for slug control.
- Crop residue significantly increases the risk of slug damage.
- The greatest damage occurs when slugs remove cotyledons and growing points shortly after canola emergence.
- Slugs may be small and difficult to find – look for shiny slug trails on leaves or the soil surface.

Before you plant

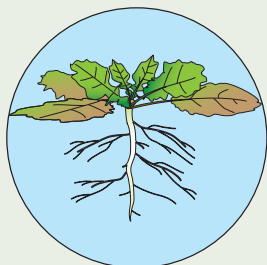
Winter canola can be sensitive to soil residues of previously applied herbicides. Check for rotational cropping restrictions with any herbicide used in the past two years. Consult herbicide labels or the *OMAFRA Guide to Weed Control*. Many winter canola varieties do not have a herbicide-tolerance trait.

SPRING

Assess Plant Health and Fertilize



VEGETATIVE/REPRODUCTIVE

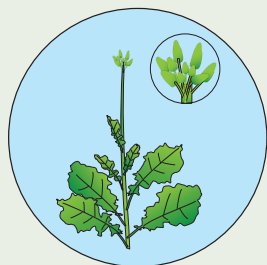


Overwintering

- Growth resumes when average temperatures reach **5°C** but will be slow until it is consistently warm.
- Leaves may have rotted off or be discoloured but the centre of the rosette should be green.

Determine the population of healthy plants.

- 5 plants/ft² or more is ideal.
- 3-4 plants/ft² is acceptable.
- 1-2 plants/ft² can be worth keeping if plants are healthy and evenly spaced, but yield potential may be reduced.



Stem elongation

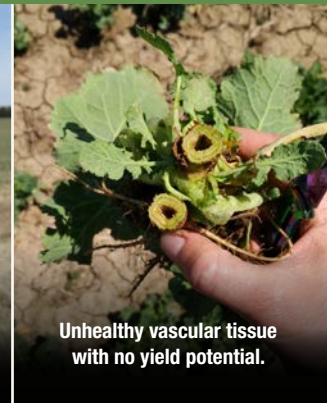
Stem elongation (bolting) begins with leaf expansion and the initiation of flower buds in the whorl of the rosette.

- The plant is moderately tolerant to hard freezes at this stage.
- Nutrient demand increases significantly at bolting.
- Apply fertilizer before elongation.

Plant health



A healthy overwintered plant may have discoloured leaves or no leaves in early spring.



Unhealthy vascular tissue with no yield potential.

Assess plant health after plants green up and begin growing.

- Living plants will be green at the growing point.
- Dead plants will rot over time and are easily pulled away from the soil.
- Cut plant crowns at the soil surface to assess health of the stem vascular tissue – it should be white to green. Hollow stems or brown tissue can indicate low yield potential.
- A strong smell may indicate rotting plants – dig up plants to check for rotten root tips, which lowers yield potential.
- Heaved plants with exposed roots have lower yield potential.
- If it is difficult to determine whether plants are healthy or not, wait a week for more growth and check again.

Spring fertilizer application

Apply fertilizer after some growth has been observed, plant health and population have been assessed, and prior to stem elongation. If fertilizer can't be applied before elongation, apply in early elongation stages but before flowering. A yield of 70 bu/acre is a reasonable target for healthy stands of winter canola.

- Canola requires 3-3.5 lb of nitrogen per bushel of grain. Generally, **30-40 lb/acre of actual nitrogen** pre-plant and **120-150 lb/acre of actual nitrogen** in spring is recommended.
- Canola has a higher sulphur requirement than wheat. In general, apply **20-30 lb/acre of sulphate** with about half applied pre-plant. Sulphur deficiency can be corrected up to early flowering.
- When plants are frozen or after the canola has elongated, it can be damaged by equipment tires. Use narrow tires and a wide boom if possible, and avoid driving through the field while plants are frosted.
- Both liquid and granular fertilizer are safe to apply.

Frost



Open flowers, buds and newly formed pods may abort during frost events leaving blank areas along the stem.



Canola stems may droop over during cold temperatures but often recover – this is not a clear sign of injury or death.

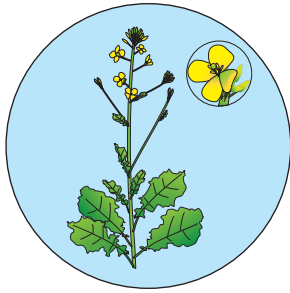
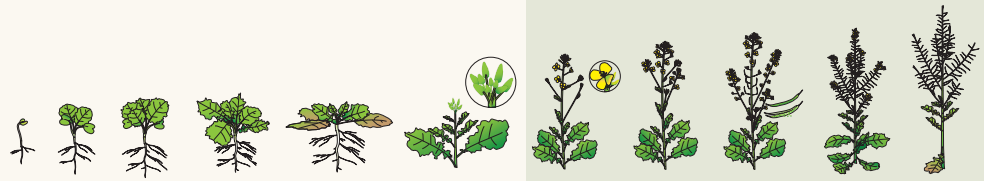
Frost events during elongation will cause plants to droop over and may cause cracked stems. Open flowers abort and buds may be injured. Secondary branches can compensate for the loss of some early flowers, minimizing the impact on yield. Injury is typically minor with brief periods at **-3 to -4°C** but increases with lower temperatures and longer cold periods.

Did you know?

Winter and spring canola grown in Ontario are the same species (*Brassica napus*). This doesn't mean that all *B. napus* varieties can be used for winter canola production. Winter canola varieties have been selected specifically because they overwinter better than other varieties.

SUMMER

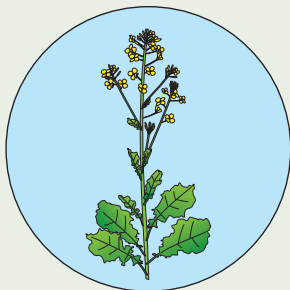
Manage Pests and Harvest



10% flowering

10% flowering is when 10 flowers are open on the main stem. Flowering begins on the main stem, with the lowest buds opening first and flowering continuing upward. Three or more flowers open per day. At first flower the stem is 30-60% of its maximum height.

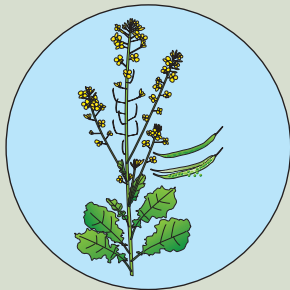
Management: Monitor for cabbage seedpod weevil from bud formation through flowering stages.



30% flowering

30% flowering is when there are 20 flowers open on the main stem. Amount of branching depends on plant population and environmental stresses.

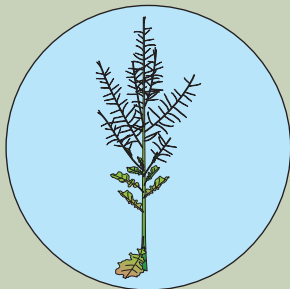
Management: Risk of white mould is typically high in healthy stands. Thick, moist canopies and temperatures of 15-25°C are ideal for mould development. Fungicide labels state application should occur at 20-50% bloom.



50% flowering

50% flowering is when there are greater than 20 flowers open on the main stem and open flowers on branches. Small pods will be visible on the lower stem.

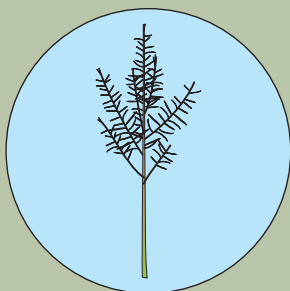
Management: The window for fungicide application closes after 50% bloom, later applications are not effective.



Ripening begins

Seed colour and coat are changing and drying out. Pods begin to lose their green colour. Grain filling typically lasts 35-55 days. Maximum seed dry weight is reached at 70-80 days after first flower.

Management: Crop drydown occurs naturally over time. Pre-harvest herbicides will control weeds and assist with drydown but do not hasten maturity. Follow herbicide label specifications for application timing.



Fully ripened

Seeds are mature and losing moisture, and final seed weight has been achieved. All pods have reached maturity and are split easily along the centre membrane.

Management: Canola is ripe when pods are dry and rattle when shaken. Begin harvest as soon as the crop is fully ripened. Seeds should be 8-10% moisture at harvest. Moisture can drop a few percent during hot days. Stems may still be green.

Seed colour change

Speckling



Seeds reach maturity at about 40% moisture. Seed moisture is lost at 1-3% per day. Seed coats turn from green to yellow to brown, with colour depending on the weather and variety.

Turning



Seed curing begins at the bottom of the main stem. Seed colour change advances up the stem at about 10% every 2-3 days. Seed colour is a better indicator of moisture content than pod or stem colour.

Fully turned

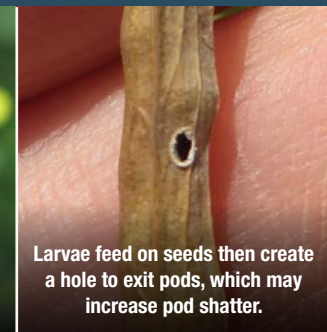


Delayed harvest can result in heated seed. Harvest should occur when there are fewer than 2% green seed and 0.1% heated seed. Crush seeds on white paper to determine the percent that are distinctly green or heated (brown to black) inside.

Cabbage seedpod weevil



Adult cabbage seedpod weevil.



Larvae feed on seeds then create a hole to exit pods, which may increase pod shatter.

Monitor for cabbage seedpod weevils from the first appearance of flower buds through to the end of flowering.

- Adults emerge when temperatures reach 15°C.
- Visible on buds and abundant at field edges.
- Scout using a sweep net in multiple areas of the field. Action threshold is an average of 2-4 per sweep.
- Larva feed on seeds in pods. Adult feeding on buds does not usually impact yield.
- If threshold is reached, protect with insecticide at 10% bloom when adults are laying eggs in newly developing pods.