Growth Stages

Understanding the growth and development of a canola plant helps the producer make more effective management decisions. Canola growth is characterized by six main growth stages. The length of each growth stage is influenced by temperature, moisture, light, nutrition and variety.

Pre-emergence (Germination)

The germination process involves water absorption, swelling, splitting of the seed coat and emergence of the root tip. Cotyledons are pushed through the soil surface by an active hypocotyl. Germination typically takes from four to 10 days, depending on soil temperature and moisture, seed soil contact and planting depth. During this stage, canola is susceptible to many soil-borne pathogens.

Seedling

Once emerged, the cotyledons open and supply the new seedling with nourishment. At this stage, the seedling still is vulnerable to soil-borne pathogens and very susceptible to flea beetle injury. The growing point of canola is between the two cotyledons. The exposed growing point is susceptible to spring frosts, soil drifting, insects and hail damage. Canola is a very poor competitor with weeds, and good stand establishment is extremely important.

Rosette

The first true leaves develop four to eight days after emergence. The plant quickly establishes a rosette with older leaves at the base increasing in size and smaller, younger leaves developing in the center. During this time, the stem length remains basically unchanged although its thickness increases.
The rosette stage is characterized by an increase in leaf area index. Rapid and abundant leaf growth captures more sunlight and produces more food for the plant, thus producing more dry matter per day and increasing yield potential. A rapidly developing canola canopy encourages root growth, reduces soil moisture evaporation and shades weeds.

Bud

Bud formation is triggered as the days lengthen and temperatures rise. A cluster of flower buds becomes visible at the center of the rosette and "bolts" or lengthens. Secondary branches arise from buds, which develop in the axils of the upper leaves. Secondary branches develop one to four leaves and a flower bud cluster. The canola plant reaches its maximum leaf area index in the bud stage. Leaves are the major source of photosynthesis and their removal results in large yield losses.
The vegetative stages (seedling to first flower) for *B. napus* generally range from 40 to 60 days, depending on environmental conditions.

Flowering

Flowering begins with the opening of the lowest bud on the main stem and continues from 14 to 21 days. Three to five flowers or more open per day, and 40 to 55 percent of the flowers that open will develop pods. High temperatures coupled with moisture stress can reduce yield potential severely during this stage.

Ripening

Ripening begins when the petal on the last formed flower on the main stem falls. By the time flowering is finished, most of the leaves have yellowed and fallen from the plant. Seed fill is completed approximately 35 to 45 days after flower initiation. The crop is considered ripe and ready to swath when 30 to 40 percent of the seeds on the main stem have turned color. Spring B. napus usually matures 85 to 110 days after planting, depending on variety and environmental conditions.

Growth-stage Key

(Source: Harper and Berkenkamp. 1975. Revised growth-stage key for *Brassica campestris* and *B. napus*. Can. J. Plant Sci. 55: 657-678.)

Stage	Description of Main Raceme
0	Pre-emergence
1	Seedling
2	Rosette
	2.1 First true leaf expanded
	2.2 Continue for each additional leaf
3	Bud
	3.1 Flower cluster visible at center of rosette
	3.2 Flower cluster raised above level of rosette – "bolting"
	3.3 Lower buds yellowing
4	Flower
	4.1 First flower open
	4.2 Many flowers open, lower pods elongating
	4.3 Lower pods starting to fill
	4.4 Flowering complete, seed enlarging in lower pods
5	Ripening
	5.1 Seeds in lower pods full size, translucent
	5.2 Seeds in lower pods green
	5.3 Seeds in lower pods green-brown or green-yellow, mottled
	5.4 Seeds in lower pods yellow or brown
	5.5 Seeds in all pods brown, plant dead