



Identifying Canola Growth Stages

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To effectively manage canola in Kentucky, the ability to identify key developmental growth stages is important. The most common canola growth stage system describes developmental stages. Several canola growth stages are important for Kentucky producers to recognize for optimal crop management and to maximize grain yield and profitability. These growth stages and identifying characteristics are listed in Table 1.

To identify any field as a specific growth stage, 50 percent or more of the plants in the field must be at the growth stage. In general, it is best not to growth stage a field until you have gotten 40 to 50 feet into the field, because edges of a field receive more sunlight and in some cases more water and nutrients and can therefore be at a different growth stage than the field as a whole.

Photographs illustrating key canola growth stages are presented in Figures 1 to 12.

References

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- Herbek, J. and L. Murdock. 1992. Plant and Growth Characteristics. In: Canola Production and Management. ID-114. Accessed December 8, 2016, at: <http://www2.ca.uky.edu/agcomm/pubs/id/id114/id114.htm>.

Table 1. Key canola growth stages, approximate timing and importance in Kentucky production.

Canola Growth Stage	Identifying Characteristics
Seedling Figure 1	<ul style="list-style-type: none"> The two cotyledon leaves of the canola plants emerge from the soil. The growing point of canola is between the cotyledon leaves and is above ground from emergence. Several small true leaves develop.
Rosette Figures 2 and 3	<ul style="list-style-type: none"> The rosette growth stage is commonly defined as a plant with six to eight true leaves with an enlarged stem that is about 6 to 10 inches tall. Some sources classify canola at the rosette stage as early as two true leaves. However, most winter canola in the southeast U.S. is used to describe plants that will survive the winter, as defined above. Canola plants typically have the best winter survival if they have reached the rosette growth stage prior to winter dormancy. Rapid leaf production occurs during this stage. Most of the growth during this stage is increased stem thickness. Excessive fall growth (>12" tall) may result in early stem elongation and crown freeze injury.
Green Bud Figure 4	<ul style="list-style-type: none"> This stage occurs immediately prior to bolting. The green flower head is enclosed by leaves, but becomes visible once leaves are rolled back.
Bolting Figure 5	<ul style="list-style-type: none"> Stem elongation begins and canola plants rapidly grow taller. Bolting typically lasts 1 to 2 weeks. Flower petals soon begin turning yellow (yellow bud stage) after bolting.
Flowering (Bloom) Figures 6-10	<ul style="list-style-type: none"> Flowering begins as soon as the first yellow flower opens. Full flowering is when 50% of the flowers on the main stem are open. Most pesticide labels, especially fungicides, specify applications as % bloom; 10% bloom is when 10% of the flowers on the main stem are open while 50% bloom is when 50% of the flowers on the main stem are open. Pods will rapidly begin developing on the lower portion of the stem while flowering continues on the top portion of the stem. Canola has an indeterminate growth with vegetative and reproductive growth occurring simultaneously. This allows it to compensate for yield-limiting factors that may occur during flowering.
Pod Fill Figure 11	<ul style="list-style-type: none"> Canola pods (siliques) contain rows of seed on both sides of a membrane (septum). Most canola pods contain 15 to 30 seeds. At about 50% bloom, lower pods are beginning to elongate. The stem becomes the major energy source for the plant.
Seed Ripening Figure 12	<ul style="list-style-type: none"> Pods gradually change color from green to pale yellow, then tan and become brittle and prone to shattering at harvest maturity. Harvest aids are commonly used to assist timely harvest and reduce shattering losses. Most harvest aids are applied once 60%-75% of seed have turned dark brown to black in color. Always follow the chemical label when applying harvest aids. Seed are initially translucent and will gradually turn green, brown and finally black at maturity. Average seed moisture at harvest is 8%-10%, with standard moisture of 8.5%. Often the stem is still green when seed and pods are at harvest maturity.



Figure 1. Canola seedlings at emergence. Note the blue seed coating still attached to the third seedling from the left.



Figure 2. Canola seedling with two cotyledon leaves and two true leaves. Some sources indicate this is the beginning of the rosette growth stage.



Figure 3. Field of dormant canola plants at rosette growth stage with six to eight true leaves. These plants are at an ideal growth stage and size for winter survival.



Figure 4. Canola plant at green bud growth stage. The green flower bud is enclosed by leaves at early bud stage and must be moved to see the bud.



Figure 5. Canola plants at bolting growth stage. Stems have elongated and buds are visible without physically moving leaves around the buds.



Figure 6. Canola plant at approximately 20% bloom.



Figure 7. Canola field at approximately 80% bloom.



Figure 8. Canola plants at approximately 90% bloom.



Figure 9. Flowering canola plant with pods beginning to elongate on the lower stem.



Figure 10. Canola plants near the end of flowering with numerous pods per plant.



Figure 11. Canola pods (collected from several different plants) ranging from immature (green: right) to physiological maturity (pale yellow: bottom left) to harvest maturity (tan: top six pods on left). At harvest maturity canola pods are brittle and will begin to shatter. To reduce shattering loss harvest aids are commonly used to desiccate the plants to allow harvest. Harvest aids are typically applied when about 60% to 75% of the seeds have turned dark brown to black.



Figure 12. Canola seed within pods. Green immature seed are within the top pod. A mix of green and brown seed are within the ripening middle pod. The bottom tan pod contains mature seed, which are dark brown to black in color. Note the membrane (septum) in the middle of the pod with seeds maturing on both sides of the middle pod.