

Agronomy Spotlight

Canola Best Management Practices

- Three types of canola are grown in the United States: spring canola in the Northern Plains, winter canola requiring vernalization in the Midwest and northern portions of some southern states, and spring types planted in the fall and overwinter in the Deep South. In Canada, it is primarily spring canola production on the Prairie provinces.
- Canola has many benefits in a crop rotation and applying best management practices can help obtain a high yield potential.



Figure 1. Flowers of *Brassica napus* and *Brassica rapa*. Image courtesy of the Canola Council of Canada.

Canola refers to the species *Brassica napus*, *Brassica rapa*, and *Brassica juncea* that produce edible cooking oils, biodiesel, and renewable diesel fuel (Figure 1). Being a cool-season crop, most canola growth is complete prior to the hottest summer months. Spring canola is planted early in the spring and harvested in late summer. Spring canola is generally grown in the northern states from Minnesota to Washington. Winter canola is planted in the fall, overwinters, and is harvested in mid-summer. Some winter cultivars require vernalization to produce flowers and seed. These are generally produced in the Pacific Northwest, the Great Plains, and Midwest regions of the U.S. In southern regions of the U.S., spring types are planted in the fall, overwinter, and are harvested in the spring (Figure 2). Winter canola is considered to have a higher yield potential than spring canola due to larger seeds with higher oil content.

Canola Best Management Practices



Figure 2. Canola production map in the US. Image courtesy of U.S. Canola Association.

As a Rotational Crop

Canola is grown in a rotation following small grains, corn, or sorghum. Using canola in a rotation with grass crops provides an opportunity to manage grass weeds. Additionally, as canola and other Brassica crops decay, they release chemical compounds that may be toxic to some soil-borne fungal diseases of plants (biofumigation) which can provide a healthier environment for subsequent crops. However, in areas where soil-borne diseases (like Sclerotinia stem rot) affect canola, canola should be grown once every four years and not in a close rotation with other susceptible crops like legumes or sunflowers.

Weed Management

Weed competition is of greatest concern early in the season. A well-established canola crop can outcompete weeds. In-season herbicide options are limited in canola, so preventative weed control is critical. Proper seedbed preparation with tillage and/or a pre-plant, broad-spectrum herbicide should be included to control early-season weeds. Always use caution and follow plant-back restrictions as canola is highly sensitive to herbicide carryover. The need for early fall planting of winter cultivars can put the crop at risk for severe yield loss or total crop failure if plant-back restrictions are not properly followed. Herbicide tolerant canola products can offer farmers more flexibility with weed management and planting time.



Canola Best Management Practices

Soils and Fertility

The highest yields are usually obtained when canola is grown on well-drained, silt loam soils. Avoid planting canola on saturated soils and soils that have drainage problems. For optimal growth and development, sufficient levels of nitrogen (N) must be available to a canola crop prior to the period of rapid growth when the plants transition from vegetative stages to reproductive stages. Canola requires almost half of its total N uptake prior to the bolting stage.¹ For winter canola, rapid N uptake occurs in the fall after planting and in the spring after winter dormancy is broken. For spring canola, rapid N uptake occurs in early spring after planting. If time and equipment permit, a split fall-spring N application is recommended for winter canola as this can provide the N needed by the crop during both stages of rapid N uptake while minimizing N losses from leaching and denitrification. Apply 25 to 33 percent of the total applied N in the fall prior to planting and top-dress the remainder in early spring.¹ Applying too much N in the fall can reduce winter hardiness and result in higher levels of winter-kill. Applications of phosphorus (P), potassium (K), boron (B), sulfur (S), and lime should be based on soil test results taken as soon as possible after harvest of the previous crop and before seeding canola. Sulfur and B are important nutrients for canola development and should be carefully managed.

Tillage Considerations

Studies have shown that winter canola yields are reduced when using a conservation tillage system.¹ Seeding, germination, and emergence can be hindered by heavy residue from the previous crop, which in turn can have a negative effect on winter survival. Canola seeds are very small, and good seed-to-soil contact can be difficult to achieve when planting through heavy residues. Conversely, spring canola can respond more positively under conservation tillage. Cooler soil temperatures and shading of seedlings, common effects of conservation tillage and standing residue cover, may be decreased in spring canola due to residues degradation over the winter months.

Planting Date

Winter canola is generally planted six weeks prior to the average date of the first killing frost. This timing allows for plants to become established enough to survive winter dormancy and weed competition in the spring. In southern regions, planting four weeks prior to the first killing frost date may be sufficient. Plants should have four to six fully opened leaves in the rosette stage prior to the onset of winter, which usually corresponds to approximately 45 days of growth.¹ Planting too early can increase the potential for insect problems (flea beetles and aphids) and winter kill due to excessive vegetative growth. Spring canola should be planted as early in the spring as possible while managing frost dates, but preferably after soil temperatures have reached 49 °F (10 °C) and higher. Winter and spring canola may benefit from fungicide and insecticide seed treatments, especially when planting early.

Canola Best Management Practices

Seeding Rate, Depth, and Row Spacing

Seeding rates vary greatly depending on seed size, planting method, and whether planting spring or winter canola. A rule of thumb is to use a seeding rate that results in 10 to 16 seedlings per square foot (111 to 177 seedlings per square meter).¹ Because only 40 to 60 percent of seeds planted develop into mature plants, this should result in an optimal plant stand at harvest of 5 to 10 plants per square foot (55 to 111 plants per square meter). Generally, this equates to a seeding rate of approximately 5 to 6 pounds per acre (5.6 to 6.7 kg/hectare) when using 7- to 8-inch (18 to 20 cm) row spacing. Increase the seeding rate if planting late, planting into a poor seedbed, or with narrow row spacings. Decrease the seeding rate if planting early and when using wider row spacings.

Canola seeds can be planted ¹/₄- to 1-inch (6.3 to 25 mm) deep if planted into moisture. Row spacing may depend on the planting equipment available.¹ Winter canola is planted in 6- to 20-inch (15 to 50 cm) rows and spring canola in 6- to 15-inch (15 to 38 cm) rows. Narrower row spacings promote quicker canopy closure which can help with weed control.

Harvest Considerations

Canola can be direct harvested if the moisture content of the crop is uniform and around 8 to 10 percent grain moisture.² Canola seeds are light and easily lost out of the back of the combine so pay careful attention to ground speed, motor speed, and airflow rate to minimize losses. Alternatively, more uniform maturity and moisture content can be achieved by swathing or "pushing" the canola crop before being threshed. Canola can be swathed when the crop reaches 30 to 40 percent moisture and 40 to 60 percent of the seeds on the main stem have turned dark brown.^{2,3} "Pushing" canola, where the canola plants are pushed over rather than being cut, serves the same purpose of accelerating maturity and may result in less seed shatter over direct cutting or swathing.

Sources

- ¹ Brown, J., Davis, J.B., Lauver, M., and Wysocki, D. 2008. Canola Growers' Manual. U.S. Canola Association. <u>https://www.uscanola.com/cropproduction/variety-trials/</u>.
- ² Stamm, M., Roozeboom, K., and Holman, J. 2013. Harvest management of canola. Kansas State University Research and Extension. MF3092.
- ³ Canola Council of Canada. 2023. Harvest management. Canola Encyclopedia. <u>https://www.canolacouncil.org/canola-encyclopedia</u>.

Legal Statements

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.

Performance may vary, from location to location and from year to year, as local growing, soil and environmental conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on their growing environment.

The recommendations in this material are based upon trial observations and feedback received from a limited number of growers and growing environments. These recommendations should be considered as one reference point and should not be substituted for the professional opinion of agronomists, entomologists or other relevant experts evaluating specific conditions.

Bayer and Bayer Cross are registered trademarks of Bayer Group. All other trademarks are the property of their respective owners. ©2024 Bayer Group. All rights reserved. 2014_97216

