

Swathing and Harvest Management

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Straight Combining vs. Swathing

Producers traditionally have swathed rather than straight combined canola; however, straight combining is an option for certain types of canola when specific conditions exist. Straight combining can save time and money, and result in improved seed quality. Canola Council of Canada research has shown straight combined and swathed yields were equal, with some straight combining trials showing increased seed size and oil content.

Heavier stands that are slightly lodged are better suited for straight combining than thinner stands because of the decreased likelihood of shattering from wind. Straight combining of canola has resulted in yield losses of 8 to 54 percent, as reported by the Canola Production Center in Canada. These losses primarily were from preharvest shattering and gathering shattering losses when canola was taken into the combine. However, 15 to 20 percent of canola in North Dakota is straight combined successfully.

As of 2011, diquat is the only product labeled for use as a preharvest desiccant in canola. Growers can maintain excellent canola yield and quality if the diquat application is timed properly and the crop harvested in a timely manner. Diquat should be applied when 60 to 75 percent of the seeds have started to turn color. Canola seeds mature in the bottom pods first, while the last seeds to mature are in the top pods. Apply the desiccant when seed in the middle pods (or 60 to 75 percent) have started to turn color. Research has shown that when the desiccant is timed properly, crop quality parameters, including canola yield, test weight, oil content, seed loss, green count and grade, generally were similar for desiccated canola compared with swathing.

However, diquat applied too early could result in lower yield and seed quality, with a trend toward higher green content. Diquat requires a seven-day preharvest interval. Research has shown that canola harvested 14 days after application will have lower green content than canola harvested seven days after application. Fields with excessively lodged canola may be difficult to desiccate because the spray droplets may not be able to penetrate the canopy. Therefore, swathing may be the better choice for lodged canola.

Swathing

Swathing canola at the optimum stage of ripening reduces green seed problems and seed shatter losses, and ensures the quality required for top grades and

prices. Inspect fields every two to three days when some color change occurs in the first-formed pods on the bottom of the main stem. To determine when a field of canola is ready to swath, examine plants from different parts of the field. The stage of maturity in an evenly maturing field will vary from plant to plant and from area to area within the field. When examining the plants, take into account varying soil types, low-lying areas, available soil moisture and exposed early ripening areas.

Examine only pods on the main stem. Seeds in pods on the bottom third of the main stem were formed earlier and will turn color much sooner than seeds in the pods on the top third of the plant. When the overall moisture content of seed from the total plant averages 30 to 35 percent, about 30 to 40 percent of the seeds in pods on the main stem will have changed color or have started to change color. Seeds with only small patches of color should be counted as color changed. Remember, the color of the seed is more important than the overall color of the field in determining the stage of maturity. Most of the seeds that have changed color will be from the bottom third of the main stem. When seeds in the bottom pods slightly turn color, seeds in the top, last-formed pods are filled or nearly filled.

Seeds in all pods on a plant complete filling (physiological maturity) at about 40 percent moisture and then slowly turn from green to light yellow or reddish brown, brown or black, depending on the

variety. In hot (90 F), dry weather, canola seed can go from 10 to 50 percent seed color change in just three to five days or less. Once filled, seeds rapidly lose moisture at about 2 to 3 percentage points or more each day, depending on the weather.

Swathing early can be beneficial if a hard fall frost is expected. Frost fixes the chlorophyll or green color in immature seed, making it difficult to remove during processing. Fall frosts rarely freeze to ground level. A swathed crop will not only lie below the coldest night temperatures, but much of the seed will benefit from the insulating properties of the swath and residual soil heat, preventing or reducing frost-fixed chlorophyll.

Another sign of canola being very near the swathing stage is the natural yellowing and senescence of leaves and leaf drop. When canola plants consist only of stems, stem branches and pods, the crop probably is very near the optimum time for swathing. Swathing can begin in Argentine canola at 15 percent seed color change. Polish canola should be left until 20 to 25 percent seed color change.

Cutting Height

The swather should be run just low enough to get all the seed pods, leaving the maximum amount of stubble in which to anchor the windrow and ensure adequate air circulation through the windrow. Most stubble height varies from 10 to 12 inches in canola fields after swathing.

Swather Table and Throat

The canola must flow smoothly through the swather without bunching. Bunching leads to uneven drying and combine plugging. Therefore, a swather for canola must have enough depth of table (40 inches) to handle the crop material. It also should have a large throat opening at least as wide (40 to 54 inches) as the distance between the two swather canvasses on center-delivery swathers. It should have a vertical clearance for the windrow of at least 30 to 40 inches.

The table canvas should be strong enough to carry the heavy load of material cut and should be run just fast enough to keep the table clean. If possible, canvas speed should be varied, depending on the maturity of the crop cut. A fast canvas tends to produce a hollow, twisted windrow; a slower canvas produces a more compact windrow, but it may bunch and sit high on the stubble. Increase the canvas speed until the windrow is pressed into the stubble.

The reel should be set as high and as far forward as possible. Reel speed should be set to correspond with the forward speed of the swather. Finger reels work best in canola to help bring the material back onto the table and gently handle the ripened canola. For a lodged or leaning canola crop, finger reels are highly recommended for ease of swathing. Ordinary end dividers, which are long and gently sloping, generally are less prone to plugging than short, abrupt types. When the crop is tall, tangled and lodged or laid across the seeded rows, divider plugging is almost

inevitable unless special vertical cutter bars or power blades are fitted on the swather. These can cause minor loss of pods and whole seed tops, but they prevent stops and bunching.

In badly lodged crops, swathing in a direction parallel to the direction in which the crop is leaning may be advantageous. In areas where windrows could be lifted and blown by the wind, a light roller pulled behind the swather will help anchor the windrow in the stubble. The roller should be set so that it just anchors the windrow into the stubble without shelling any ripe pods. Excessive roller pressure will produce a windrow that is too compact to dry quickly and will be difficult to pick up without shelling the canola. NDSU research has shown that swath pack density and seeding rates had little effect on green seed of canola.

Swathing Overly Ripe Fields

Swathing late, when seed moisture content is much lower (around 80 percent seed color change), will result in fluffy windrows susceptible to blowing and increased shattering. To reduce shattering losses, overripe fields should be swathed when humidity is high, such as after a rain, after a heavy dew or at night.

Swathing Unevenly Maturing Crops

Determining when to swath unevenly maturing fields is difficult. When checking uneven stands, a producer should do an early count on the ratio of early emerged

canola, which is bolting or starting to flower, to the late-emerged flush of young, more immature plants. Knowing the ratio of early to late-emerged canola plants allows making a better decision as to how soon to swath or to wait until the later crop catches up. If the stand is 20 to 25 percent early and 75 to 80 percent late, then waiting to cut later may be the best strategy to reduce the amount of green seed.

Curing in the Swath

Canola should be allowed to cure and ripen from 10 to 14 days in the swath before combining. If combined too early, the chance of increased green seed in the harvested crop is much greater. While starting on the early side is better for swathing, the same doesn't necessarily hold true for combining. Hot or windy weather at or after swathing can cause canola seed to be at the appropriate moisture content for combining before it has cured and cleared the green chlorophyll. This occurs because the plant dries before sufficient moisture can move into the seed to finish curing it.

Canola requires at least 20 percent moisture in the seed for the maturing process to take place and eliminate the green seed color. Checking both moisture content and green seed count before starting to combine is important. Delayed combining can help clear the green color, particularly if the swath sits through several heavy dews or light rain showers.

Practices to Reduce Green Seed

Growers can make management decisions to reduce green seed problems:

- Choose fields with better surface drainage and fertility.
- Seed as early as possible in the spring to allow for the maximum ripening time.
- Provide a firm seedbed to achieve the correct depth of planting and good seed-to-soil contact for rapid and even emergence. Do not broadcast seed!
- Swath at the recommended color stage for the weather conditions.
- Maintain adequate fertility levels for canola growth and ripening. Canola stressed from sulfur nutrient deficiency will not mature evenly.
- Take soil samples for a general indication of N, P, K and sulfur.
- Sample plant tissue early during the rosette stage to allow time for corrective sulfur applications.
- Fields with high fertility levels can be expected to delay maturity in years with below-normal growing degree day (GDD) accumulations or heat units (cool years).
- Don't swath canola if the weather forecast is for extremely hot, dry and windy conditions.
- All canola management decisions should be targeted toward uniform crop maturity.

Combining

Most combines work fairly well to harvest canola. Combines should be checked thoroughly before starting on canola. Cover any holes or worn spots in the table/platform or within a combine with duct tape or caulking compound. Leakage can occur easily in the stone trap or top feeder housing, or through lower inspection doors. The travel speed of the combine should be equal to that of the pickup so a gentle lifting of the swath occurs without tearing or pushing. Set the pickup to rub just under the swath. Cylinder speeds will depend on canola crop conditions.

Speeds of one-half to two-thirds of that used for small grains often are used for canola. The speed should be just fast enough to break open the pods. Speed reduction is important to prevent overthreshing of pods and stems and overloading the sieves. Cracked canola is caused by impact when the cylinder speed is too fast. Examine the threshed seed for cracked canola. Push your arm into the seeds and observe if cracked canola seed pieces stick to your skin or hair on your arm. Reduce cylinder speeds if excessive cracking does occur.

Fan speed should be set low to avoid blowing canola seed out with the chaff. This will allow large amounts of pods in the return. Start with a low fan speed and increase gradually until the separation of chaff and seed occurs with no canola being blown over the chaffer sieve.