Chlorophyll remains in immature canola seeds as green pigment. As canola matures, chlorophyll is broken down by enzymes and green color is cleared. The process depends on weather conditions, crop maturity, and harvest times. Green clearing becomes important as the crop is graded at market.

**Distinctly Green**

Natural variances in color and perception can make it difficult to distinguish seed that is green throughout from seed that is only slightly immature or pale green. Thus, the standard for ‘distinctly green’ seed was developed. Distinctly green seeds are assessed as green throughout after being crushed. Some canola varieties with thin seed coats appear to have a green color but are not considered distinctly green.

**Damage Factor in Grading**

USDA Grade Requirements for canola have a maximum limit of 2, 6, and 20 percent distinctly green for grades 1, 2, and 3, respectively. Green seed is categorized as a damage factor due to the difficulty and expense in removing chlorophyll and clarifying the oil from the seed. Oil quality is also compromised when high levels of green seed are being processed.

**Causes**

The timing of swathing and combining affect the clearing of chlorophyll. Seed color at swathing may need to be 15 to 20 percent changed to result in approximately 1.4 percent green seed at market. Timely swathing to prevent shattering is important for yield potential. A more relaxed approach to combining may be taken as a period of 10 to 14 days of ripening is often needed in the swath to maintain quality. Light rain and heavy dew help clear green color in the swath. Enzymes that break down chlorophyll are slowed and stopped by cool and freezing temperatures. Enzymatic activity could also stop if very hot, dry, and windy conditions reduce moisture levels to less than 20 percent.

Additional causes of high green seed count are usually related to uneven crop maturity and soil nutrients. Sulfur deficiency can cause uneven maturation of canola. A combination of high soil fertility levels and below normal accumulation of growing degree days is also expected to result in uneven maturation.

**Prevention**

Properly timed swathing is key to minimizing green seed levels and yield loss from seed shatter (Table 1). Pods on the main stem of 5 plants from different parts of the field should be opened and seeds examined. Maturity can be assessed beginning 10 days after flowering ends. Fields may be ready for swathing when:

1) Pods half-way up the main stem have seeds that are ‘turned’ with brown to tan color change. Seeds with spotting or small patches of color are considered ‘turned’.

2) Green seeds in the top pods are firm when rolled between fingers.

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Seed color change is the best indicator of maturity. Pod color may vary depending on variety and weather. A purple pigment on the tops of pods can appear on some varieties when hot and dry weather conditions are present during ripening (Figure 1). Premature swathing can result in lower yield potential even when shattering due to disease is a concern. Swathed seed contributes to yield when it is quality seed.

Swathing conditions also affect how chlorophyll is cleared from the seed. Initial curing can be maximized when moisture levels are high within the swath.\(^4\) Swathed plants can dry down quickly and die when swathing occurs on hot days. Green color may be locked because there was not enough time for enzymes to clear chlorophyll before desiccation.

After harvest, canola seed should be dried at temperatures less than 110 °F to maintain quality. At planting, focus on making a seedbed that promotes even maturation of canola plants.

Sources:

Other resources used in this publication: