FIELD FACTS

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Canola Swath Timing

Introduction

Canola pod development progresses from the base to the top of the plant. Consequently, seeds from the upper part of the plant are still green when bottom seeds are mature. Green seeds reduce quality and price of the crop. To help eliminate this problem, most growers swath their canola prior to harvest, allowing the crop to dry and seeds to change colour before combining.

Swath timing is important to minimize seed shatter losses and green seed problems and maximize yield and price of the crop. As a canola crop nears maturity, it can ripen very quickly given the appropriate weather conditions. Therefore, selecting the correct swath timing requires more careful observations and precise management than does small grains. This Field Facts will address considerations important to optimum swath timing of canola.

Canola Development

Canola flowers and pods develop first at the base of the plant. As the plant continues to grow, more flowers and pods form progressively higher on the plant. This growth pattern creates a gradient of seed maturity from the bottom to the top of the plant.

Seeds in all pods on a plant complete dry matter accumulation (physiological maturity) at about 40 percent moisture and then slowly turn from green to their mature colour: light yellow, reddish brown, brown, or black, depending on the variety. When seeds in the bottom pods slightly turn colour, seeds in the last-formed pods at the top of the plant are filled or nearly filled. At this time, most of the seeds will be firm and will roll rather than break when pressed between the forefinger and thumb.

When the moisture content of all the seeds from the plant taken together is 30 to 35 percent, about 30 to 40 percent of the seeds from the main stem will have at least started changing colour. (Canola at this stage is nearly ready for swathing in most canola varieties – see details on page 2.) In hot, dry weather with temperatures of 30 degrees C. or above, canola seed can go from 10 to 50 percent seed colour change in just four to five days (or even less). Moisture changes rapidly in the seed as well -- once filled, the seeds lose moisture at about 2 to 3 percentage points or more each day, depending on the weather. Because of these rapid moisture and colour changes, diligent monitoring of crop progress is necessary for best swath timing.

Canola flowers and pods develop last at the top of the main stem and branches. Seeds there will be the last to mature.

Monitoring Canola Maturity

Growers must monitor fields regularly to determine maturity and decide when to swath. Agronomists suggest to begin systematic inspections when the first-formed pods on the bottom of the main stem begin to turn colour. From that point on, fields should be inspected every two to three days, as the crop dries very rapidly with warm temperatures and low humidities common in late summer.

The stage of maturity will vary from plant to plant and from area to area within the field, even though the field may appear uniform from a distance. Therefore, examine plants from different parts of the field, taking into account varying soil types, topography, soil moisture, and other sources of field variability. With highly variable fields, swath timing should favor the most productive field areas, or the majority of the production in the field.

Colour of seeds is much more important than the colour of the overall crop canopy in determining the stage of maturity, so check pods and seeds diligently. Examine only those pods on the main stem. Seeds from the bottom third of the main stem were formed earlier and will turn colour much sooner than seeds formed on the top third of the plant (in evaluating

maturity, any seed with even a small patch of mature colour is counted as colour changed).

Swath Timing

The optimum time to swath canola is considered to be when 50 to 60 percent of the seeds on the main stem have begun changing colour. However, it may be neccesary to begin swathing prior to that, to prevent the crop from getting too ripe before swathing is complete. This is particularly important when growing large acreages of one variety of Argentine canola, when seeding of all acres is concentrated in a narrow timeframe, or when hot, dry conditions in late summer are predicted to rapidly mature the crop. Remember that high temperatures can move canola from 10 to 50% colour change in just a few short days.

Extensive research has shown that swathing Argentine canola can start at 10 to 15 percent colour change with minimal loss in yield and oil content (Table 1). However, recent work has shown increasing benefits in both yield and oil content, mainly from increased seed size, by waiting until 2/3s of the seeds have started to change color.

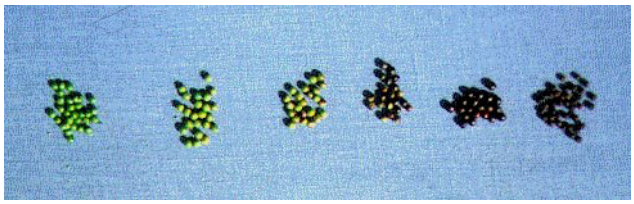
Table 1. Summary of yield and oil percentages in Argentine canola when swathed at different seed colour stages (average of 25 site years, 1990-1994)*.

Seed Colour	Yield	Oil Content
% Changed	*(bu/acre)*	*%*
0 - 10 %	27.4	40.8
10 - 20 %	29.4	41.5
20 - 30 %	30.6	42.2
30 - 40 %	30.6	42.8

*Conducted in field-scale trials with standard farm equipment at Canadian Canola Production Centres across the Prairies.

Frost Considerations

Swathing early (at 10 to 20% seed colour change on the main stem for Argentine varieties) has another advantage – reducing the risk of frost. However, swathing before 10% colour change is not recommended for these varieties under normal circumstances. An exception is swathing immediately before an impending frost. This lowers the crop mass to ground level, where the frost may not reach, and also insulates most of the immature seeds in the swath. Another exception is a very late planted crop that has not begun to reach seed colour change by mid-September. In that case, early swathing should be considered to salvage as much yield as possible before frost damage.



Demonstration of seed color changes with maturity progression in canola (courtesy of North Dakota State University).

B. napus canola varieties have been found to reach 10% seed colour change on the main stem a full two to three weeks before reaching 35% seed colour change. Swathing at approximately 10% seed colour change is a very significant practice to reduce the risk of frost damage for these varieties. Of course, this practice is most critical in cooler environments where reaching maturity before frost is a major concern.

Other Swathing Considerations

Canola growth habit and stand density should also be considered when making an early swathing decision. A dense stand of canola will branch less and be more uniform than a thin stand of the same variety. Uniform stands can be swathed early with less risk of yield loss due to immature seed. On the other hand, it may be advantageous to delay swathing a sparse crop until it reaches the higher end of the seed colour change recommendation.

Swathing Over-ripe Fields

Swathing very late (at 70 to 80% seed colour change for example), will result in fluffy windrows susceptible to blowing and increased shattering of pods and loss of seeds. To reduce shattering losses, swath over-ripe fields when humidity is high, such as after a rain, after a heavy dew, or at night

Swathing Unevenly Maturing Fields

Uneven maturity is usually the result of uneven emergence where two or more germination "flushes" have occurred. It may also be due to highly variable soil types, field topography, and/or growing conditions. Deciding when to swath these fields is difficult. Best results may be achieved by basing the swathing decision on the maturity stage representing the majority of plants, with some adjustment for the minority stages. In extremely variable fields with many stages of maturity, consider swathing as soon as some colour change is visible on the bottom pods of the main stem on the ***latest*** of the major stages.

Effect of Swath Timing on Seed Quality

In research studies, time of swathing has had very little effect on levels of green seed. In one study, swathing just prior to seed colour change did not increase the levels of green seed. Drought or frost appear to be the cause of green seed rather

than the time of swathing. If hot, dry weather occurs immediately following swathing, percent green seed may increase. If frost or extremely hot dry weather occurs before the crop has cured adequately, green colouration may be fixed in the seed.

How Long in the Swath?

Canola generally requires from 10 to 14 days in the swath to cure and ripen before combining. If combined too early, the risk of increased green seed in the harvested crop is much greater. Therefore, it is important to check both the moisture content and green seed count before starting to combine.

Hot or windy weather during or following swathing can dry canola seed to the appropriate moisture content for combining before it has cured and cleared the green chlorophyll. Canola requires at least 20% moisture in the seed for the curing process to take place and eliminate the chlorophyll. Delaying combining can help clear the green colour, particularly if the swath receives several heavy dews or light showers.

Because most Polish canola varieties are naturally less prone to shattering, direct combining rather than swathing is a real possibility for these varieties. Research at the Canadian Canola Production Centres has shown that direct combining can be an economically viable alternative for the Polish varieties tested. Hot weather can also interfere with chlorophyll clearing in a standing crop, but exposure to rain or heavy dew will reduce the problem.

For more information contact your local supplier of Pioneer canola seed or your local Pioneer account manager or area agronomist.

References:

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