

**2016 UCC Objectives – Variety Evaluation:**

- Educating farmers on the most effective way to carry out on-farm trials.
- Identifying best management practices for variety comparison with on-farm trials.

**Grower Considerations:**

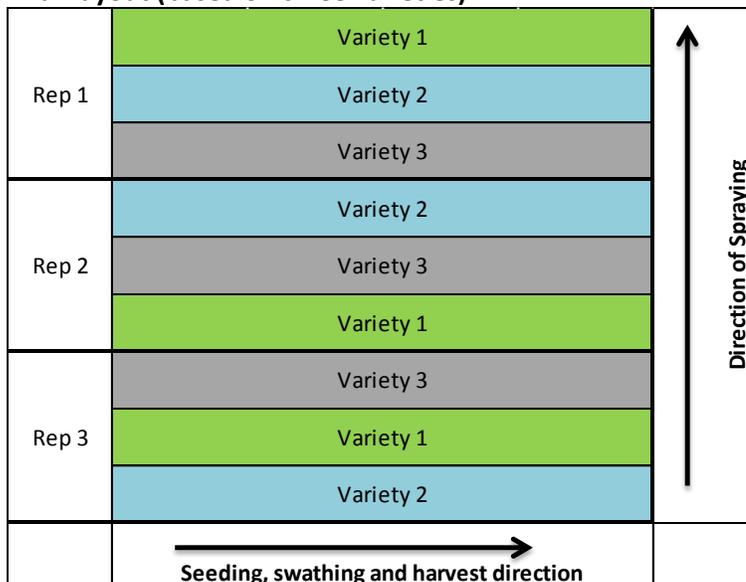
- This is a good project for growers interested in comparing two or more canola varieties on their farm.
- Test varieties from the same herbicide-tolerance system for ease of management.
- Various seed treatments and/or additional treatments (ex. JumpStart® or Lumiderm™) are available. For variety comparisons, seed treatments should be consistent across all varieties.
- Replicate and randomize each variety at least three times to account for field variability. The more replications, the more accurate the results and subsequent conclusions will be.
- If possible, all varieties should have a similar Thousand Seed Weight (TSW), and the same seeding rate used. Seeding rate formula:

**Seeding Rate (lb/ac)** = [(9.6 x desired plant density in plants/ft<sup>2</sup>) x TSW grams] ÷ estimated seed survival %

- **For example:** If TSW is 4.5 grams, desired plant population is 8 plants/ft<sup>2</sup> and estimated seed survival is 65%, seeding rate should be 5.3 pounds per acre.
- $(9.6 \times 8 \text{ plants/ft}^2 \times 4.5 \text{ g}) \div 65 = 5.3 \text{ lb/ac}$

- Assess seed colour change for swathing on an individual plot basis. This may mean swathing plots on different dates, but it will ensure that each variety was treated consistently for yield and quality purposes.

**Sample Trial Layout (based on three varieties):**



## Field-Scale Trial Tips

- The selected field should be as uniform as possible in topography and soil. If a uniform area is not possible, choose an area of the field that reflects the field as a whole.
- **Seeding:**
  - Seeding rate, depth and speed must be the same for the entire trial.
  - Seed entire trial on the same day.
  - Seed each variety across all reps, then change varieties.
- **Fertility:**
  - Profitable canola production relies heavily on adequate plant nutrition. The field should be soil sampled in detail: 0-6", and 6-24" depths testing for N, P, K, S and all micronutrients. Also test for EC, pH and organic matter.
  - If required, tissue testing can be done to measure the nutrient content of above-ground plant parts during growth.
    - If tissue testing, avoid unusual, dead or stressed plants, as well as those covered with soil or recent sprays.
    - Cut samples with a clean, rust-free knife or scissors. Send separate samples from good and poor areas within a field.
    - Make sure the plants in each area are at the same growth stage.
    - Get full testing requirements from the lab you will be submitting samples to.
- **Weed Control:**
  - Use normal weed control practices for the entire trial. Follow label recommendations for rates and timing.
  - When spraying herbicide, spray perpendicular to the direction of seeding (as shown in diagram) to ensure the same amount of wheel tracks throughout the trial. Apply to all treatments on the same day.
- **Disease Control:**
  - Use normal disease control measures for the entire trial if required.
  - If applying fungicide, spray perpendicular to the direction of seeding (as shown in diagram) to ensure the same amount of wheel tracks throughout the trial. Apply to all treatments on the same day.
- **Insect Control:**
  - Use normal insect control measures for the entire trial, if insects exceed acceptable thresholds. Follow label recommendations for rates, thresholds and timing.
  - If chemical control of insect pests is necessary, select a product registered for the purpose, and apply it at a stage when a benefit is ensured. Applying too early or too

late in the life cycle of the pest you are targeting may not give a desired result. Apply to all treatments on the same day.

- If applying insecticide, spray perpendicular to the direction of seeding (as shown in diagram) to ensure the same amount of wheel tracks throughout the trial.

#### ▪ **Swathing/Straight Cutting:**

- If swathing the canola crop, swath at 60% or more seed colour change.
- Swath/straight-cut up the middle of the plot, leaving a buffer on each side to avoid mixing of varieties.
  - When swathing, mark the swath that represents your plot with a flag.
  - Swath the remainder of the field after the plots have been swathed.
- Minimum swathing/harvest length is 500 feet (preferably longer).

#### ▪ **Harvesting**

- Harvest all treatments on the same day, when seed moisture is <10%.
- Use a weigh wagon to get the most accurate yield data.
  - Make sure weigh wagon calibrated prior to harvest season. Start with an empty hopper (prime on surrounding canola and dump) and harvest only the strips as per the swathing recommendations.
  - Measure the exact length and width of the strips. Make sure hopper is empty after each treatment.
  - If there were noticeable differences in maturity between strips, keep a grain sample in a Ziploc bag from each strip and measure moisture content later.
  - **Total Bushels** = Weight in pounds ÷ 50
  - **Total Acres Harvested** = (Total Length ft x Total Width ft) ÷ 43,560
  - **Bushels per Acre** = Total Bushels ÷ Total Acres Harvested
- Collect representative grain samples for oil and quality analysis for each variety.

#### ▪ **Record Keeping**

- Keeping records of your trial is important to the success of the trial (ex. possible pre-seed herbicide applications, plot uniformity rating, weed control ratings).
- Plan on weekly scouting of the trial to note visual differences of the varieties, and make informed decisions about weed, disease or insect control, stand establishment issues and swathing and harvest timing.
- Record major weather events (ex. hail, frost, excessive heat/humidity/rain, etc.)
- Mark the trial area for each variety with markers (indicating the variety on each marker) that are easily visible (ex. flags) and record GPS co-ordinates.

▪ **Data Collection:**

- **Seeding Rate:** Record seed size, germination and seeding rate for each variety
- **Plant stand counts:** About 2-3 weeks after seeding, count the number of plants/ft<sup>2</sup> at five randomly selected locations in each plot. Record mean values for each plot.
- **Days to Flower:** Record when 75% of canola plants have at least three open flowers.
- **Days to Maturity:** Days from planting to swathing based on the majority of the plants in the plot have 60% seed colour change. Assess each plot individually.
- **Height:** Record just prior to swathing. Randomly select and measure 10 plants/plot.
- **Lodging:** Record just prior to swathing. Degree of lean rated on a 1 – 5 scale, where 1 = upright, 3 = moderately lodged, 5 = flat on ground.
- **Yield:** Report final plot yields (in data collection table below) in bu/ac.
- **Grain Moisture:** Measure by moisture meter in field or by grain elevator.
- **Adjusted Yield:** Yield adjusted to 10% moisture (see formula below)
  - $[(100 - \% \text{ moisture}) \times \text{yield (in bu/ac)}] / 90 = \text{yield corrected to 10\% moisture}$
- **Dockage and Green Seed Count:** Measured at grain elevator.
- **\*Optional\* Environmental information:** Report daily precipitation and daily min/ave/max temperatures, GDD, last spring frost and first fall frost.

		Seeding Rate	Plant Stand Count (plants/ft <sup>2</sup> )	Days to Flower	Days to Maturity	Height	Lodging	Yield (bu/ac)	Grain Moisture (%)	Adjusted Yield (bu/ac)	Dockage (%)	Green Seed (%)
Rep 1	Variety 1											
	Variety 2											
	Variety 3											
Rep 2	Variety 1											
	Variety 2											
	Variety 3											
Rep 3	Variety 1											
	Variety 2											
	Variety 3											

▪ **Reasons for rejecting a site:**

- Hail: any hail throughout the season;
- High disease or insect pressure;
- Off-label herbicide applications or any herbicide application errors;
- Spray drift that cannot be accounted for;
- Stand establishment/other agronomic issues;
- Incorrect swathing timing;
- Lack of Researcher personnel and/or weigh wagon present at harvest; or
- Other acts of God causing big damage