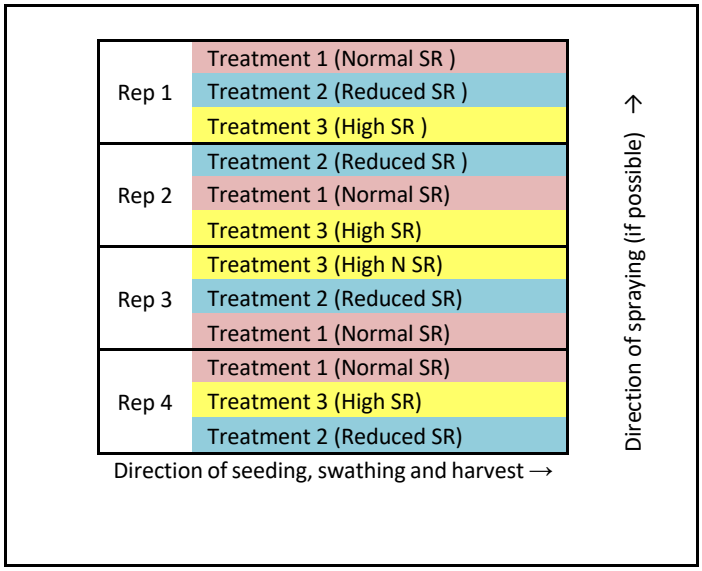
Research Trial Protocol: Seeding Rate



Research Question: Are current seeding rates optimizing canola production?

Research Objective: Identify economic and agronomic optimal seeding rates for canola production in Manitoba. Evaluate environmental factors influencing this relationship.

Treatments

1. Normal Seeding Rate/target population
   (ex. Target 7 plants/sq ft)
2. Reduced Rate – 75% of Normal Rate*
   (ex. Target 5.25 plants/sq ft)
3. High Rate – 125% of Normal Rate*
   (ex. Target 8.75 plants/sq ft)

*Do not target plant densities lower than 5 plants/sq ft or higher than 10 plants/sq ft. If this is the case only establish 2 treatments.

Adjust seeding rates to target desired plant density using seed weight and expected survivability (see https://www.canolacouncil.org/calculator/seeding-rate). Use the same expected survivability for all treatments.

Trial Design and Layout

- Randomized Complete Block
- All treatments are replicated up to 6 times, minimum 4.
- Position of treatments must be randomized within each replication (example field map)
- Treatments should run the length of the field, excluding headlands

Grower/Location Consideration Considerations

- Must be a MCGA Member
- Must be able to adjust only seeding rate independently of fertilizer
- Trial area should be placed in a relatively uniform portion of a field, avoiding major landscape changes, headlands or areas with changes in past management history (ex. Half trial area falls on land previously manured or pasture)

Data Collection (Detailed explanations in Excel Data Collection File)

1. Soil Sample
    a. Spring - composite sample from entire trial area (min 15 cores)
    b. 2 Depths: 0-15 cm (0-6") + 15-60cm (6-24")
    c. All soil samples sent to AGVISE laboratories – billed directly to MCGA Account
2. GPS Plot Points
    a. Length and Width of Plot (total width and/or seeder width) as well as GPS waypoints taken at the four corners of the trial area and between each treatment (where flags are located on one end only). The waypoint files can be sent to me in GPX, GDB, or KML file formats.
3. Plant Counts (x3)
    a. Plant counts from 5 location in each plot at Cotyledon, 3-4 leaf stage and maturity (after swathing or harvest) using provided plant count ring
4. Plant Uniformity Pictures
    a. When doing the 3-4 leaf plant counts, take a picture of plants within the plant count ring (including entire ring in picture) from 3 locations for each plot
    b. Label picture by Trail ID#, plot and picture number (ex. SR01_Plot1_Pic1)
5. Yield (Grain weight and moisture)
    a. Weight all grain from a single combine pass of each plot, the same combine must be used to harvest the entire trial.
    b. Use a **calibrated** weight wagon or grain cart. Sensitively must be <50kg on grain carts.
    c. Moisture content is required for each plot, Place 0.75 – 1 kg of seed from each strip in a sealable plastic bag and keep cool until moisture reading can be taken (within 3 days of harvest). Samples can be discarded after moisture measurement.
6. Weather Data
    a. Growing season (Apr – Sept) rainfall and temps acquired from closest MB Ag weather station. Link to website in excel fine.
7. Observational Data
    a. While at the research trials please take note if there is any major insect pressure/damage, weed control issues, disease pressure or lodging

Field Operation Records

The following information needs to be collected for each trial (included in Excel Data Collection File)

- Previous Crop (last 3 years)
- Pre-seeding tillage (implement, # passes, timing)
- Seeding Equipment (type, row spacing, opener type, width)
- Seeding Date
- Variety (Germ, TKW)
- Seeding Rate (seeds/ac)
- Seeding Depth
- Additional Seed Treatments and/or inoculants
- Fertilizer applications (product, rate (actual nutrient/ac), placement, timing)
- Herbicide (product, rate, date, crop stage)
- Fungicide (product, rate, date, crop staging)
- Desiccant (if applicable, product, rate, date, crop stage)
- Swathing Date (if applicable)
- Harvest Date
- Harvest Method (Width, Combine, Grain Cart/Weight Wagon)

General Trial Management

Seeding

- The same variety from the same seed lot should be used throughout the entire trial.
- Use a consistent seed depth, and seeding speed for the entire trial
- Seed each treatment in all replications, adjust rate and repeat.

Fertility

- All nutrients must remain at a similar rate for the entire trial to avoid confounding factors

Pesticide applications

- Spray pest control products (herbicides, fungicides, and insecticides) across the entire trial as needed similar to the remainder of the field.
- Travel perpendicular to treatments, if possible, to ensure wheel tracks are consistent across all treatments. If not possible ensure that sprayer tracks are evenly distributed amongst area to be harvested for trial yield calculation in each plot.

Swathing and Harvest Management

- If swathing, target 60% seed colour change or if there's differences in maturity between treatments, you can: (1) Swath treatments as each treatment is ready to swath (multiple trips to the trial with swather), (2) Swath treatments when the last one has reached 60% seed colour change (one trip)
- Minimum harvest length is 1000 ft
- When swathing, mark the swath that represents each plot with a flag that identifies which treatment it is.
- Each strip must be weighed individually (Ex. 3 treatments x 4 reps = 12 weighs)

- Harvest all strips on the same day, when possible, if two days are needed harvest all strips within a replicate on the same day.