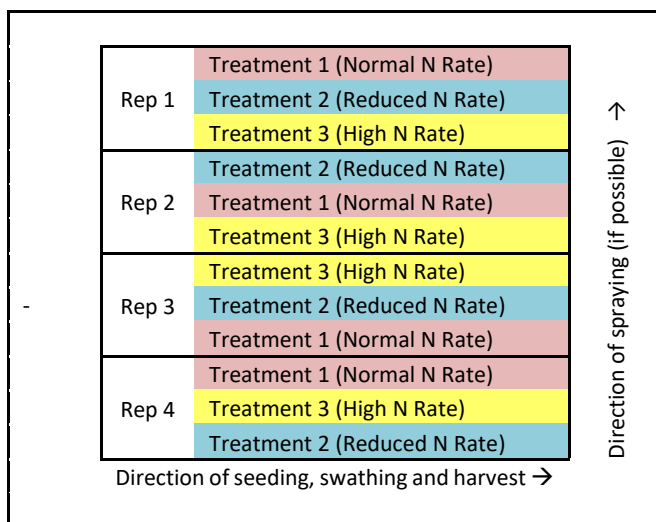


## Research Trial Protocol: Nitrogen Rate

**Research Question:** Are current N rates sufficient for canola production?

**Research Objective:** Identify optimal nitrogen (N) fertilizer application rate based on return on investment and nitrogen use efficiency.



### Treatments

1. Normal Rate of N
2. Reduced Rate – 75% of Normal N Rate
3. High Rate – 125% of Normal N Rate

### 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 N fertilizer rate (without adjusting any other nutrient rate).
- 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 – one 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
  - a. Plant counts from 5 location in each plot (stripe) at 3 leaf stage using provided plant count ring.

4. N Tissue Samples
  - a. Bolting – 30 leaves per plot
  - b. Send to AGVISE – billed directly to MCGA account **ADD ANALYSIS TYPE**
5. Yield (Grain Weight and Moisture) and Sample
  - 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 to collect plot grain weights. Sensitivity must be <50kg on grain carts.
  - c. Record harvested area for each plot (strip) (combine width, plot length, acres)
  - d. Moisture content is required for each plot (strip), 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)
  - e. Collect a 1 kg seed sample from each plot, label with trial ID and plot #. Retain sample and coordinate for MCGA pickup.
6. Weather Data
  - a. Growing season (Apr – Sept) daily rainfall and temps acquired from closest MB Ag weather station.
7. Observational Data
  - a. While at the research trials please take note if there is any major insect pressure/damage, frost events, 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 seeding rate, seed depth, and seeding speed for the entire trial
- Seed each N treatment in all replications, adjust rate and repeat.

### **Fertility**

- All nutrients other than N 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 (E.g. 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.