



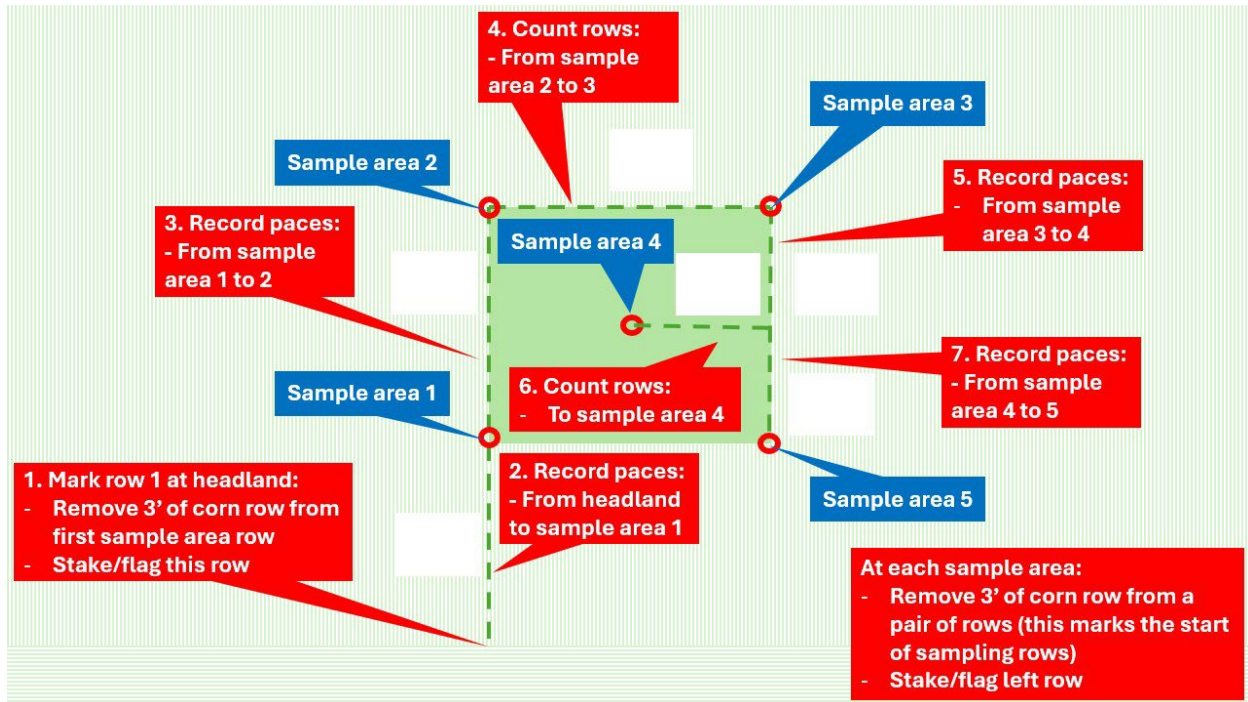
FARMER PEER LEARNING GROUP

Corn Pilot Field Protocols

1. Field and Test Area Selection

- **Field Size:** the field that you select for this project should be a minimum of 10 acres total.
- **Test Area Size:** The project test area within that field must be a minimum of 1.5 acres and a maximum of 3 acres. The area should avoid headlands, compacted areas, or areas with extreme variability. Ensure you verify the size of the area before you harvest. Areas less than 1.5 acres will not qualify for the highest yield or highest yield potential awards.
- **Marking Off the Test Area:** Clearly mark the test area using four tall flags (minimum 5 ft in height) placed at the corners of the plot. These flags should remain in place until harvest. In addition to the physical flags, please record GPS coordinates for each corner of the test area to ensure the location can be easily found throughout the season.
 - To help relocate the exact row at sampling time, cut a few plants at the start of the row leading into the test area and place one or two small flags where plants are cut. This visual cue will help you or another team member quickly identify the correct row to walk down when collecting samples.
- **Sampling Areas:** Optimally, select 5 locations at random within the test area and mark them with a flag or post that is 5' in height. These flags will be revisited throughout the season to collect your samples and will remain in the field until harvest.
 - To aid in finding the locations when corn outgrows the flags, mark the rows and record them for future sampling.
- **Sample Collection:** All soil, tissue, stalk, and grain samples along with yield data will be collected from within this 1.5 to 3 acre designated area.

See below for a sample diagram of your OCAN test plot. In the white squares, record how many paces between the sample areas, to help with relocating your sample locations:



2. Soil Test Sampling

- **Stage and Time of Sampling:** A soil sample should be taken in the spring after planting but prior to any fertilizer applications.
- **Number of Samples:** A single, combined sample from the 1.5 to 3-acre test area is required. To do this, collect a minimum of 5, 6" cores from each of the five flagged areas in your test area to produce a single composite sample composed of at least 25 cores.
- **Where to Sample:** Sample should be taken with care to account for any previous banding or "hot-spots" of fertility (for example, previous crops may have fertilizer placed in a 2x2 band or through strip-till). If not known where previous fertilizer banding has occurred, take 2 soil cores 15" apart (or half of row width) perpendicular to the direction of the rows, and collect more soil cores to combine for the sample composite.
- **Labelling Samples:** Ensure your soil sample bag clearly includes your project ID, date of sampling, and growth stage of crop (preferably pre-planting).

- **Storing Samples:** Store collected samples at room temperature and ship to the lab within one day for immediate analysis. Freeze any samples that will not be mailed immediately.
- **Notes on Collecting a Representative Sample:**
 - A sample from the test area must include enough cores (25), collected randomly from across the entire area. Too few cores increase the risk that a non-representative core could skew the result for the whole field. Non-random sampling increases the risk that a bias could be introduced into the sample. The most efficient way to achieve random sampling is to follow a zig-zag pattern around the test area. Collect a minimum of 20, 6” cores to produce the composite sample.
 - Often, the most overlooked step in collecting a soil sample is the thorough mixing of soil cores before the sub-sample is collected. Sampled soil cores should be well mixed in the bucket until no evidence of soil cores exist. Heavy clay soil cores sometimes need to be dried before they can be sufficiently mixed to allow for a suitable sub-sample. The sub-sample should be no less than 400 grams or about 1 cup of soil.
- **Where to Send the Sample:** Samples are to be sent to Honeyland Agricultural Services using the soil sample bag provided. Place the soil sample bag into the small, labelled cardboard box and drop the box into Canada Post.

3. Early Season Stand Assessment

- **Stage of Assessment:** Complete the stand assessment at the V5 stage (5 leaf collars present).
 - Mark a spot in a corn row near each tall flag (use a wooden plot stake, pin flag etc.).
 - Count the number of emerged leaf collars for 1/1000th of an acre of row length (e.g. 17’ 5” for 30” corn rows, see Table 1 for row lengths for other corn row widths) starting at the marked spot.
 - Record the number of leaf collars present for each plant in the 1/1000th of an acre of row. Repeat this process for an adjacent row (i.e. the row directly beside the assessed row).
 - Repeat the stand assessment at four other spots within the test area, for a total of 10 total rows (5 x 2 paired rows) and enter the data in the Early Season Stand Assessment form.

- Do not injure any plants in the assessment area – this same area should ideally be assessed again at maturity.

Table 1. Length of row equal to 1/1000th of an acre for various corn row widths

Row Width (Inches)	Row Length Equal to 1/1000 th of an Acre
15	34' 10"
20	26' 2"
22	23' 9"
30	17' 5"
36	14' 6"
38	13' 9"
40	13' 1"
For twin row corn, count both twin rows as one. Row width would be the distance from the centres of the twin rows.	

4. Tissue Sampling

- Stage of Sample: You will take two (2) tissue samples during the season, at both **V10 (10th leaf collar emerged)** and **VT (tasseling)**
- How to Sample: Remove the ear leaf from 5 different plants at each of the flagged locations for a total of 25 leaves (5 leaves x 5 flags). Use scissors to cut the leaves from the plant and place in a brown paper bag.
- Number of Samples: Two samples per 1.5-3 acre test area, one at the V10 growth stage (10th leaf collar emerged) and the other at VT (tasseling).
- Where to Sample: Sample 5 plants at each flag (5 x 5 flags = 25 leaves) that are representative of the plot (look at height of the plant, stem thickness, leaf burn, etc).
- Labelling your Bag: Ensure your project ID, date of sampling, and growth stage of crop is clearly indicated on the sample bag.
- Where to Send Sample: Once you have collected your tissue sample in the labelled brown paper bag, place the sample bag in the white pre-labelled envelope. Drop the envelope in the mail using Canada Post. Samples will be sent to Honeyland Agricultural Services.

5. Ear Count Assessment

- **When to Assess:** Conduct one ear count assessment between the **R4** (dough stage - kernels have turned yellow but have starchy, not sweet taste) and the **R6** (black-layer/maturity) stage.
- **Where to Assess:** At each of the 5 flagged locations, identify a single row to conduct your count (if possible, use the marked areas from the early stand assessments, but make sure to use a different row than was used for the earlier season leaf tissue sampling). Within that row, select one average ear from 5 different plants, for a total of 5 ears per row. Count and record the number of kernels around the cob and along the length of the cob using the data collection form.
- Using the provided form, fill out the date of assessment and the number of ears on each plant.

6. Stalk Nitrate Sample Collection

- **When to Sample:** Collect stalk samples **within 1-3 weeks of the field reaching physiological maturity** (when at least 80% of kernels display black layer, R6). Avoid sampling after a killing frost or if plants are already senescing rapidly.
- **Where to Sample:** Select 15 plants evenly distributed across the test area to represent field variability.
- **How to Sample:** For each of the 15 plants, cut the stalk 14” above the soil surface, and 6” above the soil surface (Fig. 1). This will provide you with one 8” stalk section. Remove leaves and sheaths from the section and ensure the stalk section is free of soil contamination and collected consistently.

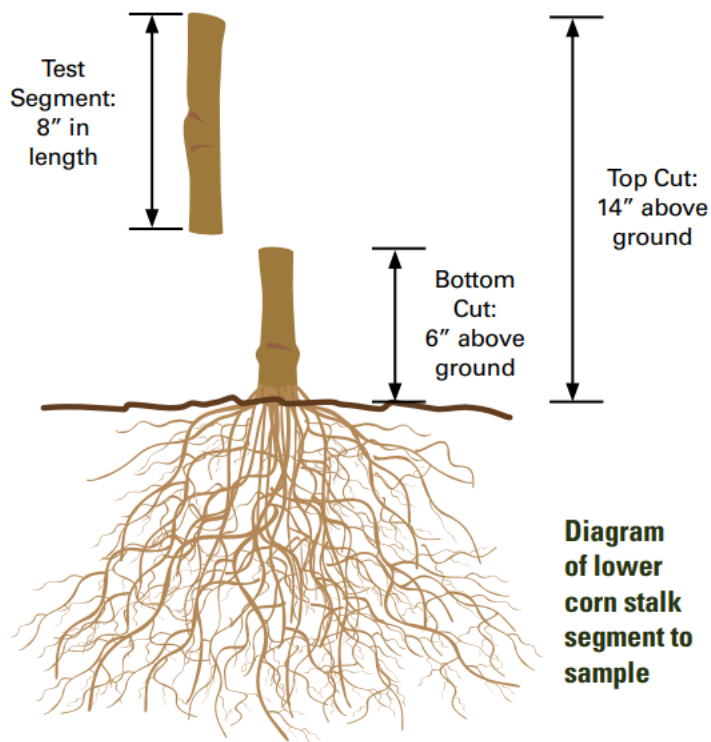


Figure 1. Diagram of lower corn stalk segment to sample (Sawyer and Mallarino, 2018)

- Labelling your Stalk Sample: Please ensure your box is labelled with your project ID and date of sampling.
- Where to Send Sample: Place all 15 stalk sections into the pre-labelled cardboard box provided (not plastic, to prevent mould). Samples are to be sent to Honeyland Agricultural Services via Canada Post. If samples cannot be shipped immediately, refrigerate or air-dry to prevent degradation.

7. Grain Sample Collection

- How to sample: **At harvest** time, collect approximately a pail's worth of grain corn representative of the harvested area. The safest option is to use a grain probe or constant swiping of the trailer or wagon containing grain from the harvested area. Mix the pail thoroughly. From the pail, collect a 2 kg representative grain sample by constant swiping while dumping the pail. The sample should represent the grain being weighed.

- If corn is at less than 20% moisture, the sample can be shipped without further drying.
- If corn is above 20% moisture, please air dry your sample to avoid spoilage while in transport. This can be done by spreading the grains out thinly on a counter or large tray such as a cookie sheet and allowing the sample to air dry in a warm and dry room). It should not be cleaned or otherwise changed before it is placed in the labelled mesh bag provided.
- Labelling Your Grain Sample: Please ensure your label includes your project ID and date of sampling.
- Where to Send Sample: Samples are to be sent to Honeyland Agricultural Services using the pre-labelled box via Canada Post. Simply drop the Ziploc bag into the box and drop the labelled box off at your local Canada Post.

8. Yield Verification

- How to Verify Yield: Please measure out the exact length and width of the area to be harvested. This area must be in the range of 1.5 to 3 acres total. Weigh off the grain using an elevator weigh scale at delivery or weigh wagon. Determine the test weight and moisture.
- What information to Collect: Complete the Harvest Verification form and include the date, your project ID, harvested plot length and width, fresh weight at harvest, moisture content, and test weight. To determine moisture and test weight, use elevator receipt or collect a representative sample and use certified moisture meter. Submit a picture or a scanned copy of your harvest form to Alex Dacey at adacey@gfo.ca. Retain the original copy for your records.
- Verifying Yield: Please have your Yield Verification form signed by an independent verifier. This can be anyone not directly associated with your entry (ie. Not the farmer, agronomist, or sponsor).

References:

Sawyer, A.J.E., and A.P. Mallarino. 2018. Use of the End-of-Season Corn Stalk Nitrate Test in Iowa Corn Production. Iowa State University.