

AE 340 Laboratory 3, Seed Meter Testing**Finger meter accuracy test**

Use the Kinze seed meter test stand to determine how planting speed, population and seed type affect seed placement accuracy.

a) Test the performance of the finger meter, for each of the four seed types, at three different speeds of 6.4, 9.6, and 12.8 km/h (4, 6, and 8 mph) and 3 different populations of 40,000 64,250 and 79,000 plants/ha (16000, 26000, 32000 plants/ac) in 0.762m (30") rows. For each run, print of the statistics for the accuracy of the meter, and the number of skips, doubles, and triples in the track. Set the meter to count 200 seeds.

In the laboratory report, provide a table of the following information for each seed type, speed and populations (show sample calculations for a single test condition)

- a. Number of skips, doubles, and triples in the test, normalized to 100 seeds
- b. Estimated overall accuracy of the meter based on the test data. The total error may be found by the following equation.
  - $\text{Total Error} = 1 * (\# \text{ skips}/) + 1 * (\# \text{ doubles}/\text{run}) + 2 * (\# \text{ triples}/\text{run})$
  - $\text{Est. Accuracy} = (\text{Theoretical Total \# of seeds} - \text{Total Error}) / \text{Theoretical Total \# of seeds}$ .
- c. Determine the nominal mean spacing for each target plant population.
- d. Assume that a skip doubles the spacing between two adjacent plants, and that a double is 2.5cm (1") from the closest plant. Calculate the standard deviation of the plant spacing for each test condition.
- e. Assume that the climatic conditions are such a corn field is capable of producing 12.5 Mg/hectare (200 bu/ac) for all three plant populations and that for every 2.5cm (1") increase in standard deviation results in a 0.14 Mg/ha (2.2 bu/ac) decrease in yield. Determine the yield reduction per hectare for each of the test runs, at the different populations and seed conditions.
- f. Make plots of the following information versus planting speed
- g. Total Error (percent basis) vs. speed for each seed type and population combination (different curves).
- h. Percent yield reduction vs. speed for each seed type and population combination (different curves).
- i. Make a recommendation on what the ideal speed and population is for the most accurate planting, and comment on the sensitivity and interactions of the metering system to target population, ground speed and seed type.