

Protocol: p8 Setup & Measure 2016

qGen3 Experiment

Background

In the summer of 2015 we initiated another large experiment to assess adaptive potential called qGen3. We crossed maternal plants in exPt1 with pollen from Landfill and Staffanson. We sowed the resulting achenes in October 2015 in exPt8. The outline of p8 is not a rectangle. In general, **697 is the lowest Position** (on the South end closest to HWY 27) and **755 is the highest Position** (on the North end closest to the Hjelm House). Planted **Rows** range from **101** on the West edge (closest to Tower Rd.) to **181** on the East edge (closest to the electric lines). Note that not all rows are planted.

Goal

To measure fitness traits including emergence and survival in progeny of qGen3 crosses.

Equipment Needed

Visor with assigned rows & segments, meter stick, toothpicks, rulers, 50-meter, 30-meter, and 5-meter tapes, *Echinacea* seedling search image in your head

Search/Mark/Measure: Most often we will be measuring in blocks of 10 (1-meter) segments. Choose a visor and open the form “2016qGen3Measure” and locate the starting row and nail. Enter initials for you and your partner in the “**measuredBy**” field. **Double check that you are in the correct location!** At each nail, search a linear segment from 0.05 to 0.95m. Look for seedlings away from the tape. Mark any *Echinacea* seedlings found with colored plastic toothpicks. Place toothpicks 2cm north of each seedling found. Use different colored toothpicks for seedlings that are next to each other. For example, do not place two of the same colored toothpicks in a row! Use colors in a rotation so that when you have to repeat the use of a certain color, the seedlings are as far apart as possible. An ideal color rotation follows the order that the toothpick colors are listed in the visor. Keep track of how many seedlings you have found in the segment. Once you have thoroughly searched the segment, record the total number of seedlings on the main form under “**seedlingCount.**” Record anything unusual or noteworthy about the segment in the field “**segmentNotes.**” Use a semicolon to separate notes – **no commas!**

After searching and marking seedlings with toothpicks, measure each seedling as follows:

1. Click on the **seedlingMeasure** subform button that looks like a rectangular icon.
2. Double check that the **row** and **nail** being searched match the position in the visor! If you are working on nail 700, you should be between nails at positions 700 and 701. Do not change the row and nail fields – these are tied to the main form.
3. **tPickColor:** Using the dropdown selection box, select the color of the toothpick. (blu, org, wht, grn, red, yel)
4. **northDist:** Determine the distance of your seedling along the tape in centimeters. Distances should range from 5 to 95 centimeters.
5. **eastDir:** Determine the direction of your seedling in relation to the tape. Select if you seedling is West, On, or East of the tape. (West is toward Tower Rd.)
6. **eastDist:** Determine the east/west distance of the seedling from the tape in centimeters. If your seedling is west of the tape (toward Tower Rd), record as negative centimeters. If your seedling

is East of the tape (toward Electric lines), record as positive centimeters. If your seedling is on the tape, record as 0 cm. Example: seedling 10 cm west of tape, record "-10."

7. **1LeafCm**: Record the length of first leaf in cm. Record additional leaves in **2LeafCm** & **3LeafCm** fields. Measure from the top of the cotyledons to the top of the leaf using a ruler.
8. **cotyledonStatus**: Using the multi-selection box, select the status of the cotyledons. You can make multiple selections. Options include: present, not present, green, yellow, brown, shriveled, 1, 3. Most EA seedlings have 2 cotyledons, but some may have 1 or 3.
9. **seedlingNotes**: Record anything unusual or noteworthy in this field.
10. Repeat for each seedling found at your position.
11. Return to the main form creating a new seedling record & then deleting it.
12. Double check that the number of seedlings measured matches the number recorded in **seedlingCount**.
13. **Completed**: Click the completed checkbox & proceed to the next record/nail.