Sunflower SOP

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BAGGING

THINGS TO REMEMBER

- Watch out for segregation of plants (i.e., when plants are different = flowers, plant height, branching, etc.). If you encounter a plot that is segregating find a supervisor.
- Do not bag an off-type (i.e., plant that looks different from the rest of the plot).
- If the plant is branched, with multiple heads, get at least three heads into the bag if possible.
- Do not bag the first plant that flowers in a plot unless there are only 5 plants in the plot.
- Periodically check bags to make sure that the flowers have enough room to expand – if cramped readjust bags.
- If flowers have already opened on the plants in a plot find a supervisor.
- If you are not sure about something, ask.

TOOLS REQUIRED

- Apron
- Cloth Pollination Bags
- Pruners

GETTING STARTED

1. Grab all required tools.
2. Fit the apron to your waist.
3. Fill both large side pockets with the cloth pollination bags.
   a. Folding the bags length-ways and stacking them, allows more bags to fit inside the pockets.
4. Place the pruners into another pocket on the apron.
5. Begin checking each plot.

BAGGING

1. Select a head that is ready to be bagged.
   a. To gauge the optimal time see Appendix A.
2. Using the pruners, remove only the leaves that will interfere with the bag.
3. Place the bag over the head.
   a. If there are multiple heads on the plant cover at least three in the same bag.

4. **Close the bag around the stem.**
   a. The goal is to not allow room for any pollinators to get in.

5. **Tie the bag closed.**
   a. Skipping the crossing of strings, tie the knot like a pair of shoes.
   b. See Appendix B for further explanation.

6. Pull the sides of the bag to create space for the head to continue growing.

7. Repeat steps 1 – 6 for the remainder of plants, required per plot.

Appendix A – Bagging at the Right Time

Use the images below as a reference what to bag and what to avoid. The optimal head is not only a match to the image below but is also representative of the majority of the heads with in the plot. If all heads within the plot are shaped in a similar manner, select the most representative. If all or most of the heads are passed the optimal point check with your supervisor for further direction.

TOO EARLY

EARLY, BUT OKAY. BAG IF FRIDAY OR BEFORE RAIN IS EXPECTED



OPTIMAL

PAST OPTIMAL

**AVOID – NOT CIRCULAR**

AVOID - DAMAGED

APPENDIX B – TYING THE POLLINATION BAG

The purpose of tying the pollination bag is twofold. It not only helps to keep any pollinators out of the bag but, it also keeps the bag from opening due to wind.

Tying the bag is not hard however, there is a specific knot that should be used. Using the 'Bow Knot' allows consistency and quick access into the bag as the knot can be undone with a tug on a loose end.

The images below have been taken from fieggen.com and can be found HERE.

Note: The "Starting Knot" should be skipped.
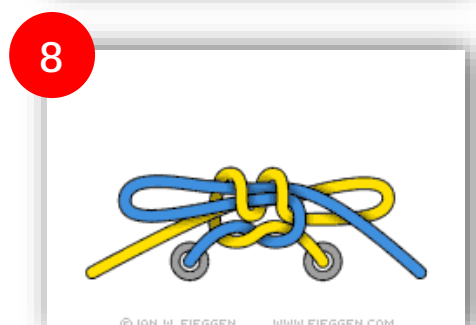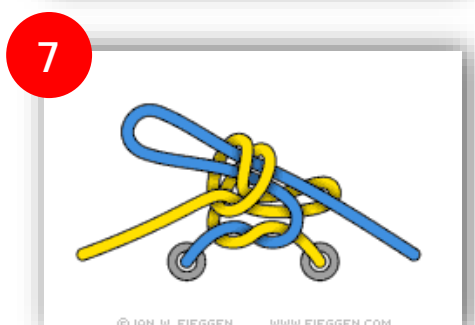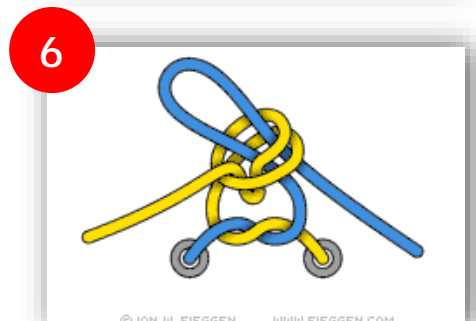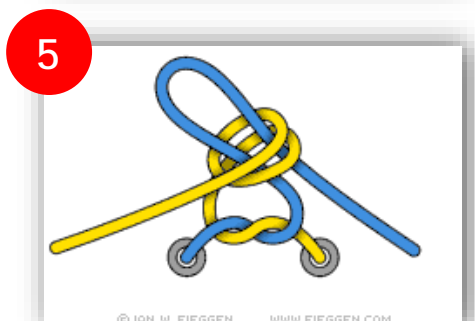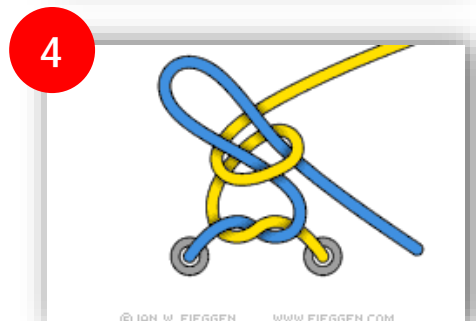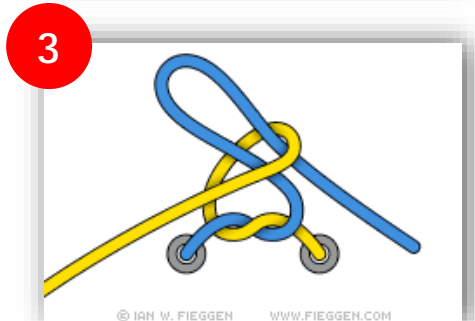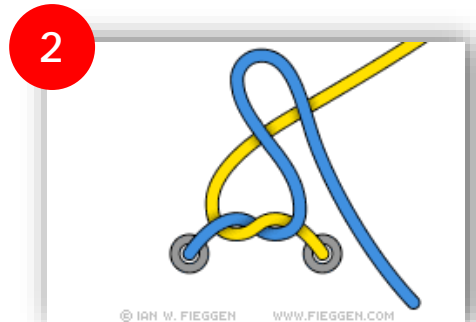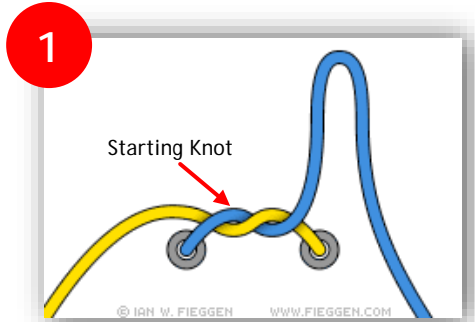
MEASURING

THINGS TO REMEMBER

- Only measure groups that have all the heads (usually 8) for that particular Ames number.
- Ensure any comments made while measuring are consistent.
- Save the file after measuring all heads within an Ames number.
- Clean the pan after each head.
- If any seed is spilled outside of the Delnet bag and into the pan pour it back after measuring.
- If a head contains seed that is different from the other heads in that Ames # write a comment.
- If you are not sure about something, ask.

TOOLS REQUIRED

- Tin Pan
- Scissors
- Pruners
- Spatula
- Tape Measure

GETTING STARTED

1. Grab all required tools.
2. Place the first group of heads (usually 8 mesh bags all with the same Ames #) near you for measuring.

3. Open the current years SAM Head Measurement excel file.
   a.
4. Locate the first empty cell in column A and select it.

	A	B	C	
A1314			*Jx*	
1	Today's Date:	Monday, July 13, 2015		
2	Increase Lot	Plot Number	Plant Number	Flow
1307	Ames*31760* 14ncax07*SD*	1479	plant 7, self	
1308	Ames*31760* 14ncax05*SD*	1479	plant 5, do not self	
1309	Ames*31760* 14ncax03*SD*	1181	plant 3, self	
1310	Ames*31760* 14ncax06*SD*	1479	plant 6, do not self	
1311	Ames*31760* 14ncax08*SD*	1479	plant 8, self	
1312	Ames*31760* 14ncax04*SD*	1181	plant 4, self	UN
1313	Ames*31760* 14ncax02*SD*	1181	plant 2, do not self	
1314				
1315				
1316				

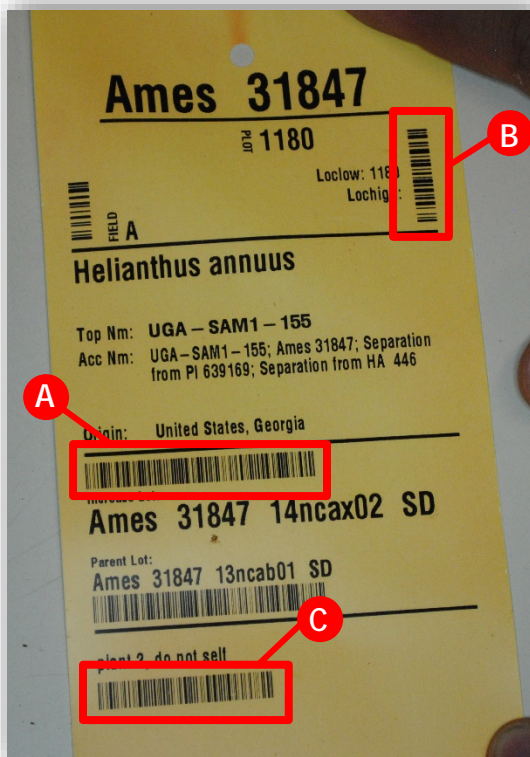5. Pull the harvest tag and head out of the mesh bag.

6. Place the head in the pan.

7. **Cut the string off of the tag and throw the string away in the trash can, not the can designated for organic matter.**
   a. String removal is another indicator that the head has been measured.
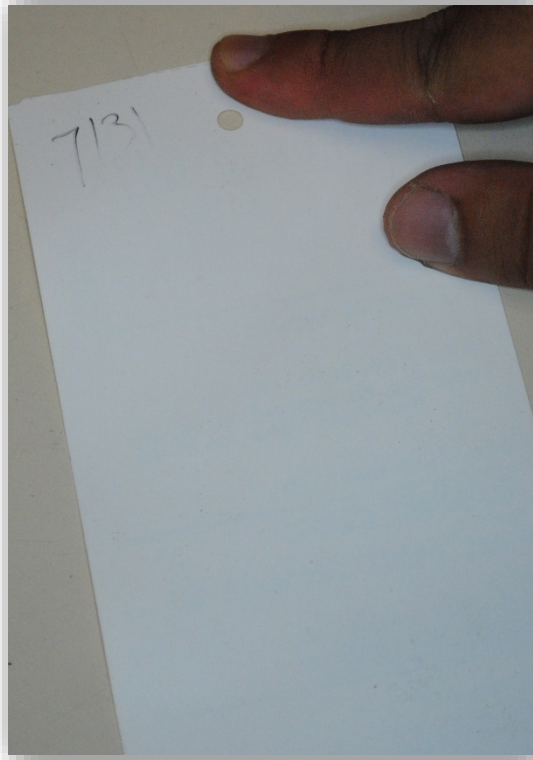

8. **Scan the three bar codes to enter the data into columns A, B, and C.**

a. If the bar code will not scan copy the data from the cell above (Command-d) and adjust the information accordingly (Use F2 to enter a cell).

9. **Turn the tag over and enter the date in column D, Flowering Date.**
   a. If there is no date listed, enter 'UNKNOWN'.

10. **Enter any comments, also on the back of the tag, in column E, Field Comments.**
    a. Anything that was written on the tag other than the date goes here. Separate each item with a comma.
    b. If the only comment on the back is: =, +, or -, you must type an apostrophe first. This is done so as not to start an excel formula. Example: '=
11. **In column F enter the date the head is measured. Usually the current date.**

MEASURING

1. **Open the Delnet bag containing the head.**
   a. Keep the head over the open bag if possible.
   b. If the Delnet bag contains multiple heads see Appendix B.

2. **Using the pruners, remove the excess stem.**
   a. Keep fingers away from the pruners to avoid injury.

3. Turn the head over to inspect for patchy development, broken pieces, etc.
   a. For inspection and commenting, see Appendix A.

4. Break off the sepals (Leave structure on the outer edge).

5. **Place the tape measure on one edge where the broken sepals meet the edge of the outer seeds.**
   a. The first measurement must always be the diameter of the widest section of the head.
   b. Make certain the tape measure is on the centimeter side.
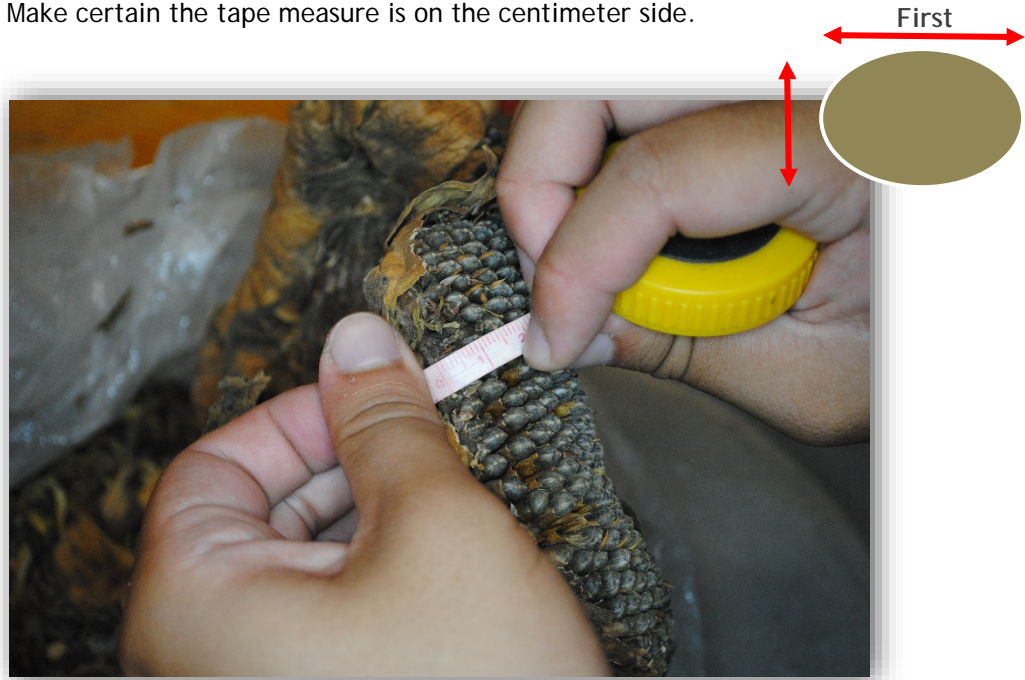
6. **Stretch the tape measure straight across the head.**
   a. Keep the tape measure against the head to get a true measurement.

7. Extend the tape measure to the point where the outer seeds meet the broken sepals.

8. Record the measurement in column G, EXT1.
    a. Round to the nearest half centimeter.
9. Without moving the head, take the tape and measure the diameter of the space not containing viable seed (see below).

10. Record the measurement in column H, INT1.
    a. If the head is full of seed all the way to the center, record '0'.
    b. If the head is too patchy for an accurate measurement input '?' and comment accordingly in column K, Measuring Comments. See Appendix A for more details.
11. Turn the head 90º and repeat steps 4 through 10 recording in columns I and J, respectively.

FINISHING UP

1. Place the head back into the Delnet bag.
2. Using the same twist-tie, close the bag.

3. Place the head back into the mesh bag.
4. Place the tag back into the mesh bag.

5. Close the mesh bag.
6. Place the finished head aside and continue with the remaining heads in the Ames number.

7. Once all heads within the Ames number have been measured use an orange twist-tie to bundle them together on the hook.

8. Unless the heads will be threshed immediately, return the bundled heads to dry storage.

APPENDIX A – INSPECTION / COMMENTING

When inspecting heads, try to keep standards consistent. What is considered patchy one day should be considered patchy any other day. When unsure, ask. Below are two images depicting a completely full head as well as a head with a patchy center.

FIGURE 1: COMPLETE, FULL HEAD

FIGURE 2: SLIGHTLY PATCHY CENTER

Heads will range in the amount of seed that they contain. Also, note that if a head is broken, insert '?' into the measurement columns (G – J) and comment that it is broken. If there are multiple heads mixed within the Delnet bag measure the largest and make an appropriate comment.

The list below contains a few of the possible comments that can be made.

- Patchy Center
- Very Patchy
- Broken head, unable to measure.
- Very Little Seed
- Seeds have fallen off head. Unable to measure.
- Ringed
- All heads mixed, only large head measured.
- Hole In Head

APPENDIX B – MULTIPLE HEADS

Occasionally a Delnet bag will contain multiple heads. If all of the heads in the bag are mixed measure only the largest head while keeping the smaller heads inside the bag. Ensure a comment is made explaining what was done (See Appendix A). If the heads are separated, follow the steps below before moving on.

1. Do not undo the twist tie separating the heads.

2. Remove all excess stem from the heads.

3. Move all loose heads and debris into the opposite corner of the Delnet bag.

4. Use another white twist tie to close that corner separating it from the rest of the bag.

5. Open the twist tie containing the single, larger head (this is the main head).
   a. Measure only the main head.
6. **Continue on with** .

IMAGE CLOSE UPS

FIGURE 1: COMPLETE, FULL HEAD

FIGURE 2: **SLIGHTLY** PATCHY CENTER

THRESHING

THINGS TO REMEMBER

- If a seed or seeds drops on the table or floor do not pick it up unless you know for sure which seed it is.
- When working next to other students also threshing seeds please leave enough space to avoid mixing seed.
- If you are not sure about something, ask.

TOOLS REQUIRED

- Tin Pan
- Triangular Pour Pan
- Stapler
- Rubber Bands
- Paper Clips
- Sharpie
- Envelopes

GETTING STARTED

1. Gather all required tools in the threshing room.
2. Place the first group of heads near you.
3. Grab the first mesh bag from the group.
4. Remove the Delnet bag, containing the head(s), and tag from the mesh bag.
5. Open the Delnet bag over top of the tin pan.
   a. If the Delnet bag contains multiple heads see Appendix A.

6. Dump the contents of the Delnet bag into the pan, discard Delnet bag.

7. **Rub the seed off the head (wearing gloves).**
   a. Ensure the head is facing down over the pan.

8. **Examine the head for any remaining seed.**

9. **Pour the contents of the tin pan, carefully, into the triangular pour pan.**
    a. Keep the tag with the seed at all times. When other heads are also being threshed it is easy to mix things up.
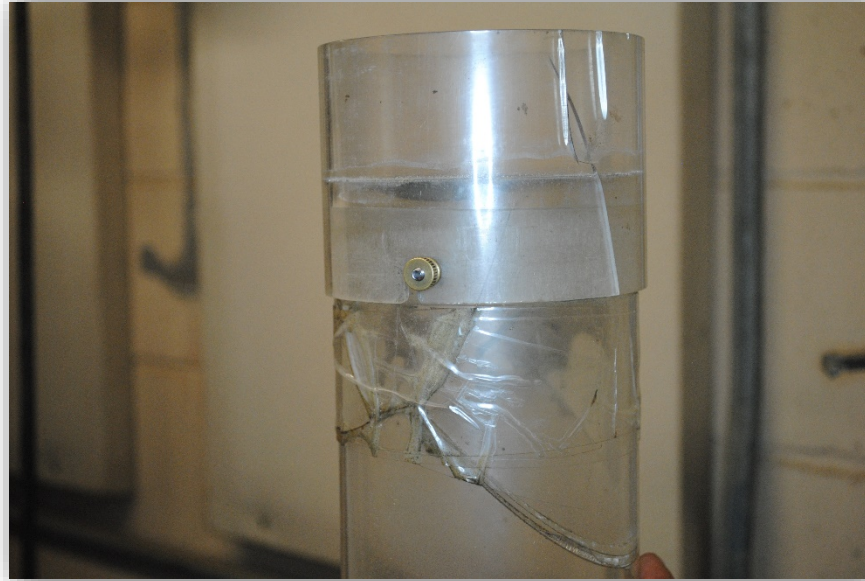
USING THE BLOWER

1. Move the pour pan to the blower.
2. Remove the tag from the pan and place it on the blower table.
3. Ensure the blower tube is empty and the mesh screen is free of debris.
4. Pour everything from the pan into the base of the blower tube.

5. Place the pan on the table and insert the top portion of the blower tube into the base tube.
   a. The blower tubing is very fragile. Be careful when you are using it.

6. **Lock the top piece of the blower tube in place by tightening the nut.**
   a. NOTE: The larger blower does not have this feature. When blowing you must hold this piece down.


7. **Move the dust collector head over the blower tube.**
   a. Do not touch the tube with the dust collector. Leave at least six inches to one foot between them.

8. Turn on the dust collector using the black switch by the door.
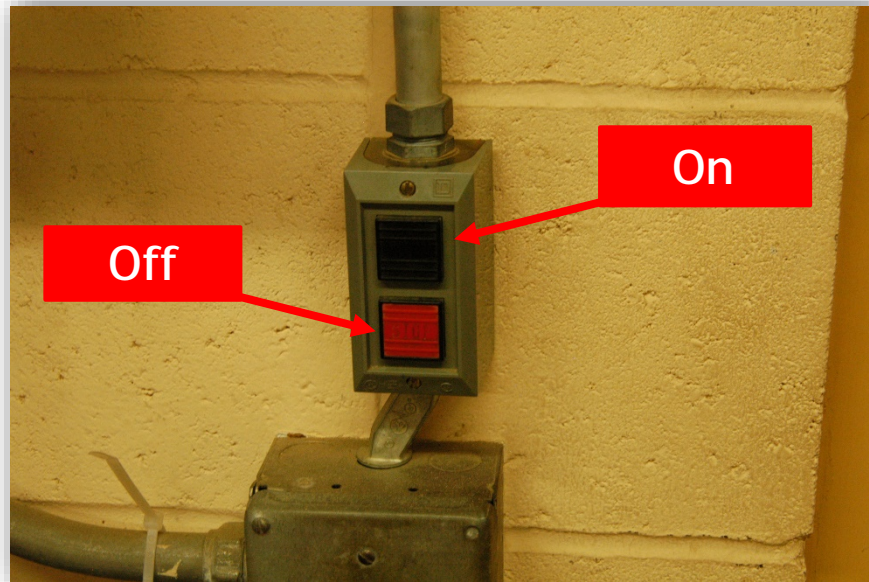
9. Turn the blower on by flipping the switch on the far left corner of the base.
10. Slowly increase the speed of the blower by moving the metal bar on the right side forward.
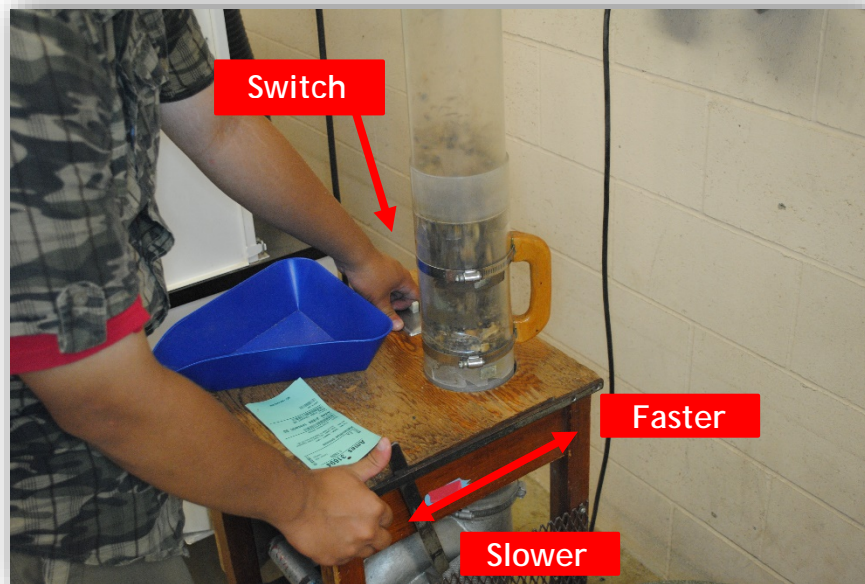
11. When the top section of the blower tube is full of trash/chaff/empty hulls, slow down by moving the metal bar backward.
12. Turn the blower off.

13. Remove the top of the blower tube and empty that plant material into triangular pour pan.
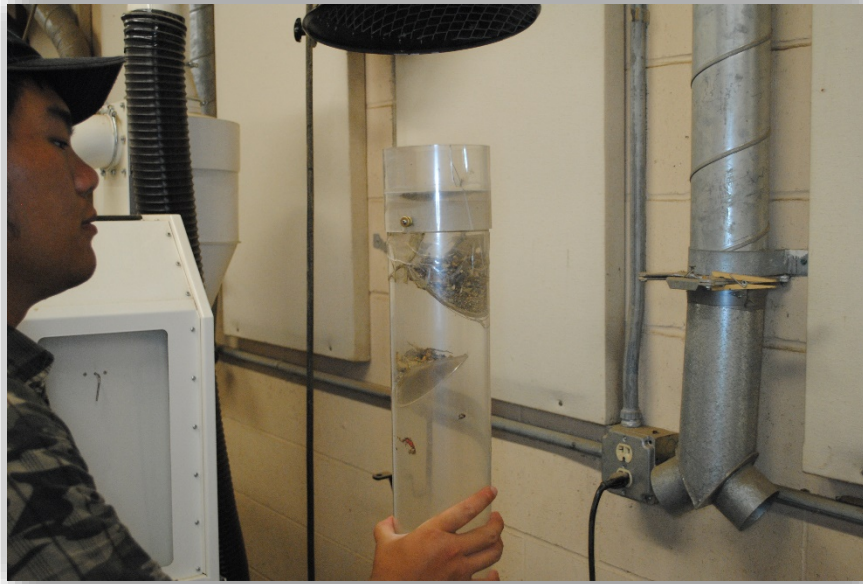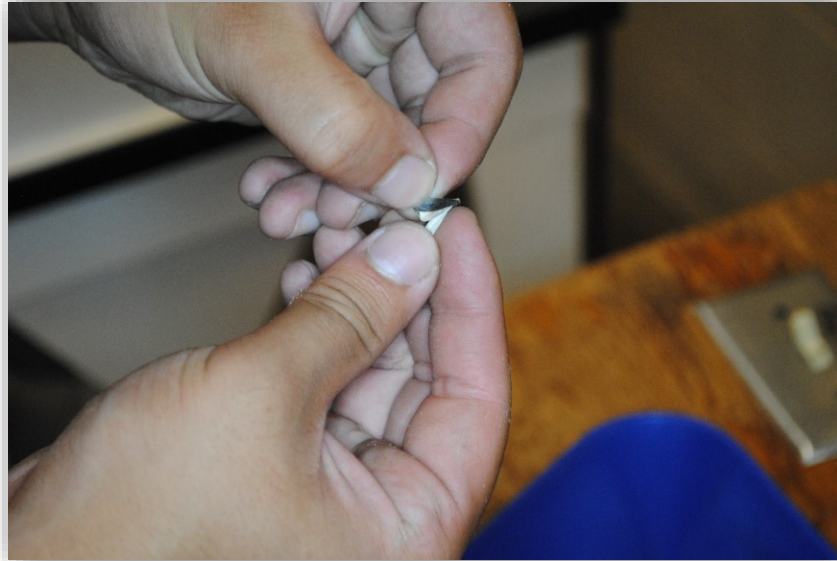

14. Pick out five seeds.
    a. These will be a sample of the seeds in the pour pan.

15. Open each seed coat and look for a seed inside.


16. Follow either "a" or "b".
    a. If the sample contains no viable seed throw the material in the pour pan, into the organic trash and repeat steps 9 through 15.
    b. If the sample does contain viable seed move on to step 17.
17. Pour any remaining seed in the base tube back into the pour pan.
18. Move the pour pan containing the seed and tag back to the work table.

FINISHING UP

1. Place an empty envelop on the table next to the tag.

2. **Using the Sharpie write the following on the front of the envelope.**
   a. Ames Number, Plot Number, Plant Number, and Field Notes (From the back of the tag)
   b. **NOTE:** "1 of __" is needed only if the amount of seed is too large for a single envelope. If there is no viable seed write "0 Seed".
   c. **NOTE:** See **Appendix A** for Multiple Heads.
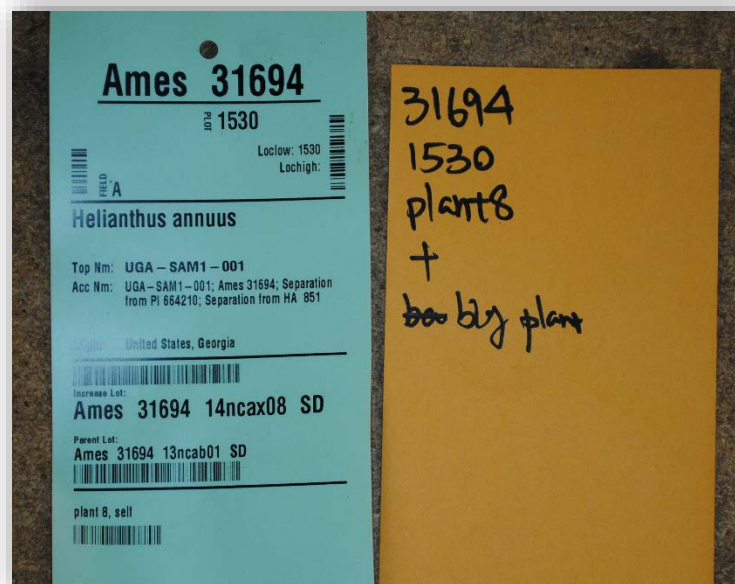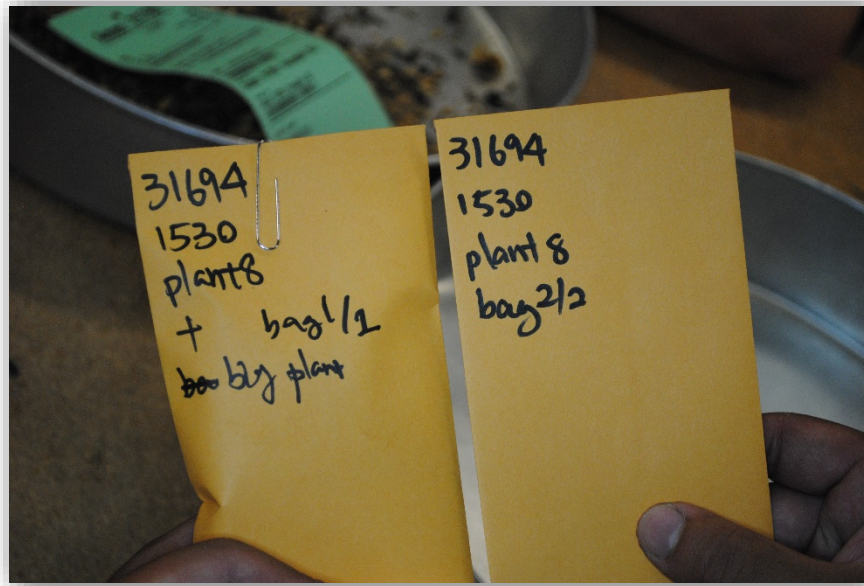
3. **Staple the tag to the envelope.**
   a. The staple is placed at the bottom of the envelope and tag. If multiple envelopes are used staple the envelope marked as either, "1 of ___" or "Main Head".
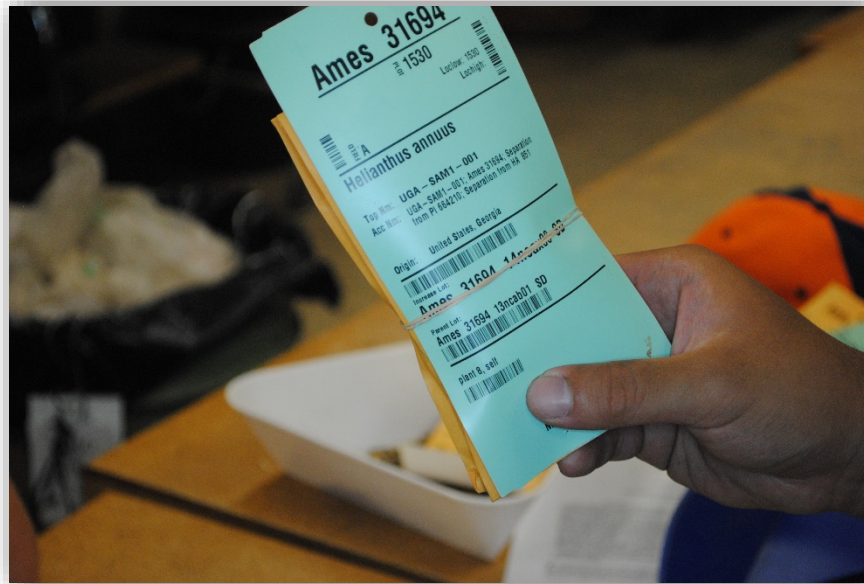
4. Pour the seed into the envelope over the, cleaned, tin pan.

5. Use a paper clip to secure the opening of the envelope(s).

6. When multiple envelopes are needed, wrap a rubber band around them.

7. Place the complete seed packets with the others for storage. Ask your supervisor how the envelopes should be ordered (by Ames #, plot #, etc.)

APPENDIX A – MULTIPLE HEADS

Occasionally a Delnet bag will contain multiple heads. If all of the heads in the bag are mixed thresh all of the heads together and continue from step 6. If the heads are separated in the Delnet bag, thresh them separately (step 6). Also, keep the following note in mind.

- **In addition to step 2 of Finishing Up.**
    - o Write "Main Head" on the envelope containing the seed from the main head.
    - o Write "Other Heads" on the envelope containing the seed from the other separate heads.

IMAGE CLOSE UPS

Seed

Ames 31694
PLOT 1530
Loclow: 1530
Lochigh:
FIELD A
Helianthus annuus
Top Nm: UGA — SAM1 — 001
Acc Nm: UGA—SAM1—001; Ames 31694; Separation from PI 664210; Separation from HA 851
United States, Georgia
Increase Lot: Ames 31694 14ncax08 SD
Parent Lot: Ames 31694 13ncab01 SD
plant 8, self

31694
1530
plant8
+
boo bly plant

Back of Tag