MOORE FARMS
botanical garden

Collections Management Manual

Working draft. Last updated 8/11/15.

Note that in the below Table of Contents you may Ctrl + Click on any heading to jump to that section.

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Objective

This document serves to provide standards and procedures for the accessioning, inventory, maintenance, and deaccessioning of the plants comprising the living collection of the Moore Farms Botanical Garden in accordance with the Living Collections Policy.

Accessioning

Definition

Accessioning refers to the process by which a newly acquired plant (or previously unaccessioned existing/spontaneous plant) enters the collection. An accession is defined as a plant or group of plants belonging to the same taxon which were obtained from the same source and entered the collection at the same time. For example orders of *Styrax japonicus* 'Emerald Pagoda' from two different nurseries would be considered separate accessions, due to their differing source. Similarly, orders of *Styrax japonicus* 'Emerald Pagoda' from the same nursery placed two years apart would be considered separate accessions. However, an order of three *Styrax japonicus* 'Emerald Pagoda' from one nursery center on one date would be considered as three different plants belonging to the same accession. As stated in the living collections policy, all woody trees and shrubs, herbaceous perennials, bulbs, annual plants, and non-hardy tropicals save for temporary acquisitions (plants for resale, loans, and some educational classes) are required to be accessioned.

Additionally, accessions are often split into separate entities called qualifiers. For example, accession 0522m14 consists of three *Juniperus virginiana* 'Royo'. Though all these plants share the same accession number, they will still need to be tracked individually for purposes such as GPS Mapping and performance evaluation. In this case, the three plants would each receive a serial number trailing from the accession number (0522m14-1, 0522m14-2, and 0522m14-3).

Workflow

Approval
Before beginning the accessioning progress, the individual wishing to accession a plant must first seek the permission of the Garden Director. A decision as to whether the plant in question is suitable for entering the collection will be made based on the provisions specified in the Living Collections Policy. If approved, the requestor may begin the process of obtaining the plant.

Acquisition
If an accession of this taxon is currently living at the Moore Farms Botanical Garden, it is generally preferable to propagate from that plant as opposed to purchasing a new one for cost-saving purposes. However, purchasing plants is a common method of acquisition as well, particularly if the plant requested is not currently represented in the collection or overly difficult to propagate.

Propagation Request
A request for Propagation can be placed through the Filemaker Database system. The Production Coordinator will review the request and determine its feasibility.

Relevant Walkthroughs:

- [*Request a Propagation* (pp. 95)](#)

Purchasing Request

If an accession of this taxon is not currently living at the Moore Farms Botanical Garden, or if the propagation request is denied by the Production Coordinator, the person requesting the plant may order or obtain it from a nursery or garden center. If the plant will be part of a delivery, a calendar event should be created and shared with the Horticulture Department. This event should specify the delivery date and time as well as which entity the plants have been purchased for (MFBG, LCPC, etc.). If available, a digital copy of the invoice should be attached to the event. Deliveries should only be scheduled between 7:30-12:00 and 1:00-3:30 M-F.

Recording

When the plant order has physically arrived at the Moore Farms Botanical Garden, a staff-person should check the order for completeness and quality of plant material. This person should then notify the Plant Recorder the delivery has arrived, and supply them with a copy of the packing slip. The Plant Recorder will then create a database record in order to begin the formal accessioning process. This should be performed within one week of receiving the plant.

Nomenclatural Standards

All plant nomenclature should be consistent with the following two codes:

- [International Code of Nomenclature for algae, fungi, and plants (Melbourne Code)](#)
- International Code for Nomenclature of Cultivated Plants (8th Edition)

Data-entry

The Plant Recorder will enter the required and relevant data in the Filemaker database in order to accession the plant. At minimum, the following information is required.

- Identity of Plant
- Source of Plant
- Quantity Received
- Date Received
- Size
- Cost Paid
- Entity Intended for (MFBG, LCPC, etc.)

Relevant Walkthroughs:

- [*Accessioning a Plant* (pp. 19)](#)

Labeling

Label Specifications

Accession Labels should be created by the Plant Recorder upon time of accession. These contain the scientific name, botanical family, accession number, and a code indicating the provenance of the plant. Accession labels are 3.50" × 1.06" × 0.032" black anodized aluminum with a 0.156" diameter hole drilled 0.125" from left margin of the label and centered vertically. Accession labels are purchased from Damon Co of Salem Inc. The tag described above is code 12A50BKJ115.

All plants require an accession label save for recent collections still in propagule form (seed, cutting, or root cutting), annual plants, or plants purchased for use in Lake City Landscapes.

Some accession labels will be stake mounted. Stakes are metal and 12" in length, twisted to form a loop at the top with the bottom 10" of the stake left straight. The label is then affixed to the loop of the stake using 1-2 inches of a black 0.062" diameter 22 gauge electronics wire.

Display labels are created for select plants only. These exhibit the Botanical Name, Common Name, Family, and other information about the plant including Source or Native Range. Display labels are 3" × 4" × 1/8" Gravoglas 2-Plex ABS plastic. They have two 1/8" diameter holes, centered on the top and bottom margins of the label.

Display labels may be mounted directly to a branch of plant with the use of the same 22 gauge electronics wire used for accession labels. In the case of larger trees without easily accessible branches, it may be preferable to mount the label directly to the tree using a spring and screw system.

For Perennials, smaller trees or trees with dense, low branching canopies, it will generally be advisable to mount the labels to a stake. Stakes are a 4' × 1/8" × ¾" extruded aluminum flat bar. Two 1/8" diameter holes are drilled in the top 3" of the stake to match the holes in the display label. The top 3" of the stake are then bent using a vice to a 30°-45° angle. The display label is attached using two 1/8" diameter capacity pop rivets. The bottom of the stake may be cut or ground into a point using either a grinder or handheld metal band saw.

Relevant Walkthroughs:

- *[Engraving a List of Accession Labels (pp. 29)](#)*
- *[Engraving a List Display Labels (pp. 39)](#)*

Label Installation

As soon as an accession label is produced, it should be installed. If possible, the label should be attached to a plant while it is still in the production facility. In this case, the label should typically be stake mounted for an herbaceous plant, subshrub, or a woody plant in a container size <3G. The stake mounted label should be installed directly in the plant container.

For plants in the landscape, the location for the label must be on the north side of the plant and no further than 18" from the base, though closer is preferable. Once the label has been installed, any remaining nursery label should be removed from the plant. For trees and shrubs, the label should be affixed directly to the plant (forgoing use of a stake) on a north-facing branch. If there is no suitable branch for this purpose, the label should be stake mounted and installed on the north side of the plant as close to the base as possible.

Data-entry

Plants requiring a label will be automatically flagged as such via a calculation field in the database. This allows for an export of all plants requiring engraved labels. However, the Plant Recorder must indicate which plants he or she has labeled in order to properly update this field. This can be completed by changing the Boolean value of the locations::tagged field from "0 (no)" to "1 (yes)". This process can be greatly accelerated by utilizing the "Clear Label Requests" button on the "Engrave Accession Label" layout or by importing an excel file and utilizing Filemaker's Import Records Function.

Relevant Walkthroughs:

- [Engraving a List of Accession Labels (Step 22 on pp. 37)](#)

Planting

Horticultural Standards

All plants should be installed under the direction of the best management practices dictated by the below sources, or as directed by the Horticulture Supervisor.

- International Society for Arboriculture- Arborists' Certification Study Guide (3rd Edition)
- South Carolina Nursery & Landscape Association- SC Certified Nursery Professional Test Study Manual

In addition to the above standards, all plants should be thoroughly watered in at the time of planting to aid with the establishment process. Plants should be also photographed at the time of planting with the resulting picture uploaded to the database. See Pg. 30 for the image uploading procedure.

In many garden areas, a 1-2" layer of a suitable mulch should also be applied at the time of planting. The Horticulture Supervisor or Garden Director should be consulted to determine the necessity and type of mulch. If deemed necessary, plants may be staked or guyed at time of planting provided the stake selected meets the aesthetic requirements of the garden area.

If the plant does not appear in suitable condition to enter the collection, the Garden Director or Horticulture Supervisor should be contacted as to the possibility of deaccessioning the plant. Proceed to **Deaccessioning** (Pg. 35).

Record Planting Location and Changes in Quantities

After installing the plant, its new location must be noted in the database and the quantity of plants in the old location updated. For example, if an accession consisted fifteen *Agave americana* located in the production facility and ten were planted on the green roof, the quantity referring to X-00 (production facility) should be changed to "5", and a new line should be created for J-20 (Green Roof) with a quantity of "10". The planting size and date of planting should be recorded in the relevant fields as well. Failure to perform this step at time of planting is currently the most prominent source of errors in the database.

Relevant Walkthroughs

- *Record Planting* (pp. 49)
- *Enter a Note* (pp. 82)
- *Adding an Image* (pp. 89)

Mapping

If possible, a plant should be mapped with the use of a GPS unit shortly after it has been planted in the landscape. The Trimble Geo7x GPS Unit currently used for mapping at MFBG can produce readings with an accuracy of up to 4" with the aid of a Zephyr Model 2 external antenna and post-correction with a CORS station in Lake City, SC. The minimum accepted accuracy for a plant position at MFBG is 1m.

Relevant Walkthroughs

- *Mapping a Plant* (pp. 51)

Organizational Chart

```
                          ┌─────────────────────┐
                          │   Request New Plant  │
                          └─────────────────────┘
                                     │
                          ┌─────────────────────┐
                          │    Approve Request   │
                          │   Garden Director    │
                          └─────────────────────┘
```

Plant to be propagated in house		Plant to be purchased or otherwise obtained
Request Propagation in Database		Obtain Plant
Propagate Plant / Production Coordinator		Notify Plant Recorder on Arrival
Install Label / Production Coordinator	Plant of insufficient size for installation	Accession in Database / Plant Recorder
Maintain and Inventory / Production Coordinator	Plant for immediate installation	Produce Label / Plant Recorder
Plant ready for Landscape		

Plant in Landscape

Update Location & Quantities in Database

Install Label
Plant Recorder

Maintain & Inventory

General Maintenance & Inventory

Definition
After entering the living collection, the health of plants must be maintained and observed until the time of deaccession. Inventory or field checking refers to the process of observing plants in the living collection and recording their health and performance on a regular basis.

Workflow

Maintenance
The health and aesthetically pleasing nature of each plant accessioned will be maintained under the supervision of the Horticulture Supervisor and Garden Director. This includes direct maintenance tasks on the plant itself such as structural pruning, deadheading, seasonal cutbacks, and pest and disease monitoring. After these tasks are performed, a care note should be inputted in the database documenting the date of task, description of task, and location in which task was performed. Additionally, some indirect tasks will be performed on the garden bed or area such as maintaining a clean layer of mulch, and removal of weeds, leaves, or debris, which need not be entered unless deemed important by the staff-person completing the task.

Inventory

Frequency
As specified in the living collections policy, a complete inventory of the living collection should be completed every two years. The Inventory will be completed by the Plant Recorder and Staff member responsible for the maintenance of the garden area (See Appendix I). The greenhouses and holding areas comprising the production facility should be inventoried by the Production Coordinator every six months.

Inventory Procedure
All plants on the inventory should be checked and a note about their performance recorded. For the most part these will be "observation" notes, though nomenclature notes or miscellaneous questions are not uncommon as well. Plants should also be photographed at this time (see procedure below). Plants in poor condition should be recommended for deaccessioning. Perennial and Woody plants not currently mapped should be so at this time.

Relevant Walkthroughs:

- *Printing an Inventory List* (pp. 94)
- *Enter a Note* (pp. 82)
- *Adding an Image* (pp. 89)
- *Mapping a Plant* (pp. 51)

Preparation of a Voucher Specimen

If the new accession is the first representative of a taxon for the living collection, a voucher specimen will be prepared and submitted to the A.C. Moore Herbarium at the University of South Carolina. This will generally occur when the plant is reproductive and has reached a size from which a sample can be taken without causing undue harm to the plant. In many cases, it may be necessary to collect multiple specimens to document all vegetative and reproductive tissue. In this case, the material collected should be from the same plant if possible. The Garden Director, Plant Recorder, or other appointed personnel will produce the specimen, attempt to verify the identity of the plant, and submit to the A.C. Moore Herbarium.

Relevant Walkthroughs:

- [*Produce a Herbarium Specimen* (pp. 99)](#) *– currently unwritten*
- [*Print a Herbarium Label* (pp. 99)](#) *– currently unwritten*

Organizational Chart

```
┌─────────────────────────────┐          ┌─────────────────────────────┐
│ Check Status/Health of Plant │          │   First Accession of this    │
│ Every 2ⁿᵈ Year or as convenient│        │   Taxon, Plant Flowering     │
│          Variable            │          └─────────────────────────────┘
└─────────────────────────────┘                         │
               │                                         ▼
               ▼                          ┌─────────────────────────────┐
┌─────────────────────────────┐          │   Produce Voucher Specimen   │
│     Enter Check Note in      │          └─────────────────────────────┘
│         Database             │
│          Variable            │
└─────────────────────────────┘
        │              │
        ▼              ▼
┌──────────────┐  ┌──────────────────┐
│ Plant in Good│  │ Plant in Poor    │
│  Condition   │  │  Condition       │
└──────────────┘  └──────────────────┘
                          │
                          ▼
                  ┌──────────────────┐
                  │ Request Deaccession│
                  │     Variable      │
                  └──────────────────┘
```
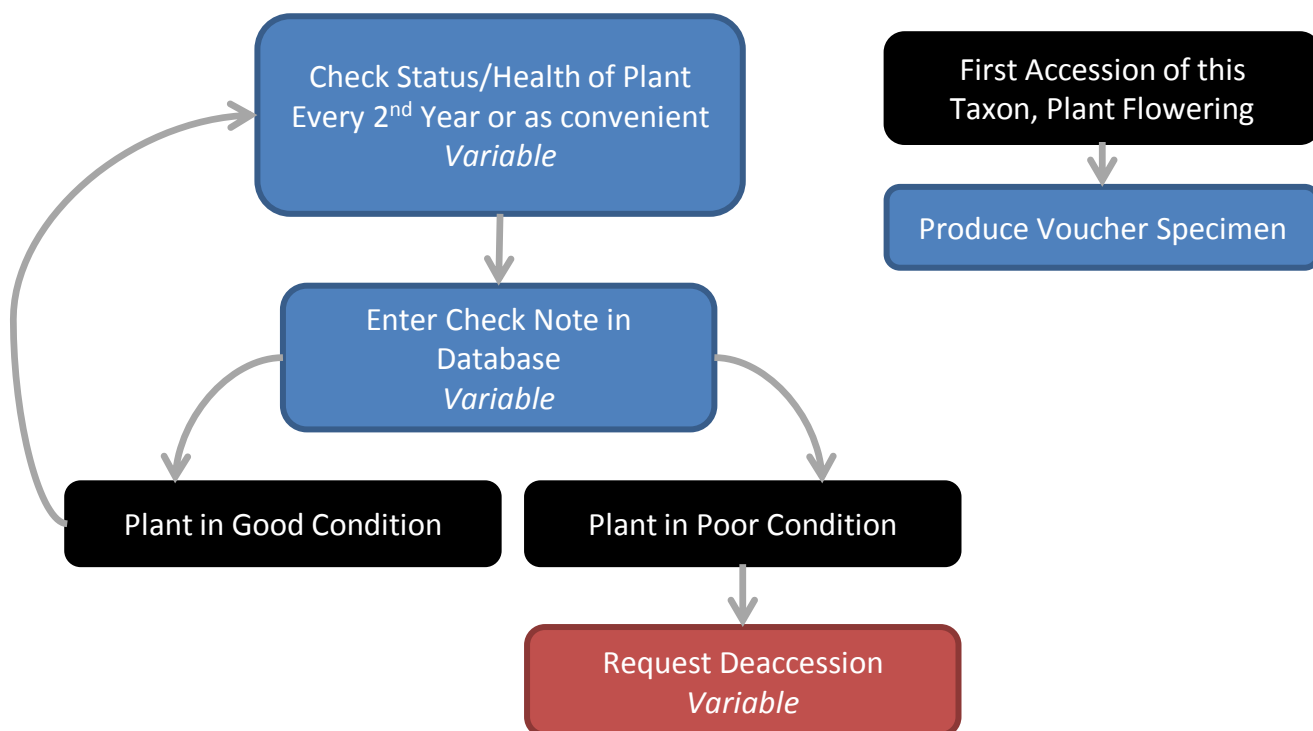
Deaccessioning

Definition

Deaccessioning refers to the process of removing a plant from the living collection. Though in many cases this is due to the death of the plant, the terms are not synonymous and living plants are frequently deaccessioned as well. Reasons for such can include crowding of a preferable plant, no longer meeting the aesthetic requirements of the garden, or a plant in imminent decline due to pest and disease issues.

Workflow

Approval and Removal

Once a staff member has recommended a plant for deaccession, the request must be approved by the Garden Director or Horticulture Supervisor. Following their approval, the plant should be removed from the collection in a timely fashion. The label and stake if present should be removed from the landscape and given to the Plant Recorder.

Data-entry Procedure

Once the plant has been removed, the date of removal and reason for its deaccessioning should be indicated in the database. There are specialized fields in the database for this purpose, though a general database note may be added as well. This should be completed as soon as the plant is removed, and no later than a week thereafter.

Relevant Walkthroughs:

- *[Recording Death or Removal of a Plant](#) (pp. 92)*
- *[Entering a Note](#) (pp. 82)*

Organizational Chart

Request Deaccession

↓

Approve Request
Garden Director
Horticulture Supervisor

↓

Remove Plant

↓

Record Cause of Death,
Update Locations &
Quantities in Database
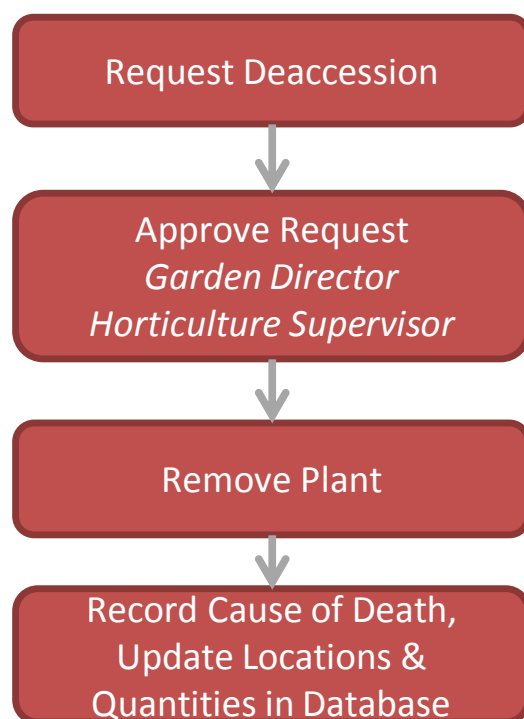
Manual & Walkthroughs

Logging in to the Database

Our Filemaker Pro 12 Database is hosted on a server located in Brentwood, TN (Longterm Solutions, LLC). In order to access this database, you need to log in to the server by using a remote launcher file. This is located on the majority of MFBG workstations under the filename "launch_mooreplants.fmp12".

1. Open the file. The following window will appear.
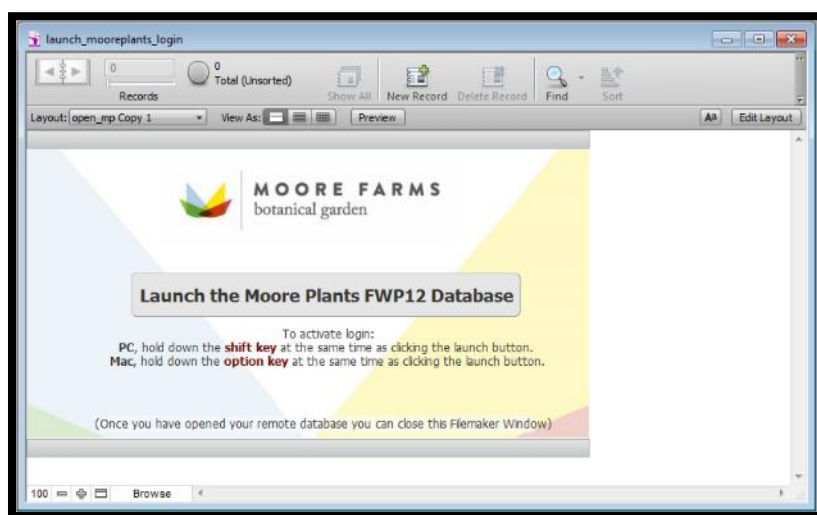
2. Hold the shift key while clicking on the grey "Launch the Moore Plants FWP12 Database" button (or instead hold option if using a MacOS system). Make sure to continue holding down the shift or option key until the login prompt appears.
3. Enter your assigned Account Name and Password, then click OK. *Hint: In order to make your name automatically appear in the "Account Name" box, navigate to the main menu bar, select edit, then preferences. Enter your account name in the "User Name" box of the preferences window.*
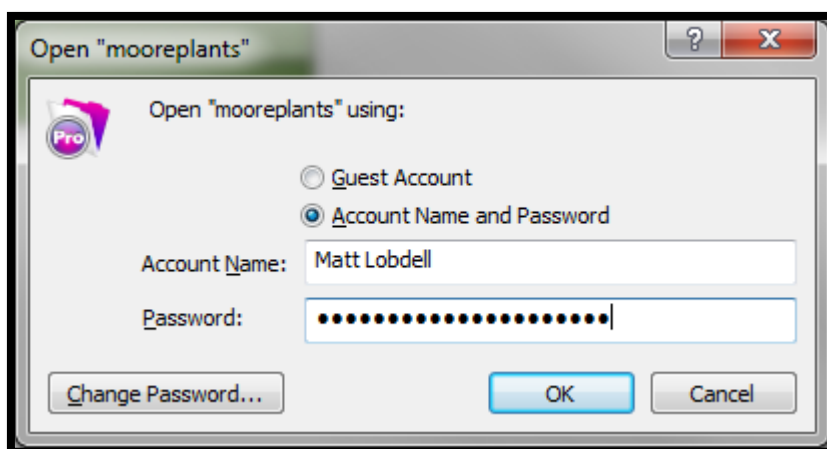
4. The Main Menu will appear.

Searching for a Plant

Layouts in Filemaker can be viewed either in Browse Mode or Find Mode. Browse Mode is used to view and edit records, whereas Find Mode is used to locate a specific record or set of records. The below walkthrough provides a simple procedure to search for specific plants or a group of plant accessions. For more details on advanced searching methods and find requests, please consult the FileMaker Pro 12 Help Section "Finding and Replacing Data" (Home > Using FileMaker Pro > Finding, sorting, and replacing data).

1. On the main menu, click the "View or Edit Plant Accession" button

2. The standard layout for editing plants will appear, defaulting to the first record in the database (*Aspidistra caspitosa* 'Jade Ribbons')

3. Click the Find button on the top menubar (or use the keyboard shortcut "Ctrl F").

4. The record will go blank, and any field in which you can input a find request will show a small magnifying glass icon.

5. An example find request would be to enter "Magnolia" in the genus field. In this case, filemaker will search for all records with the genus field set to "Magnolia". Once done, click the "Perform Find" Button.
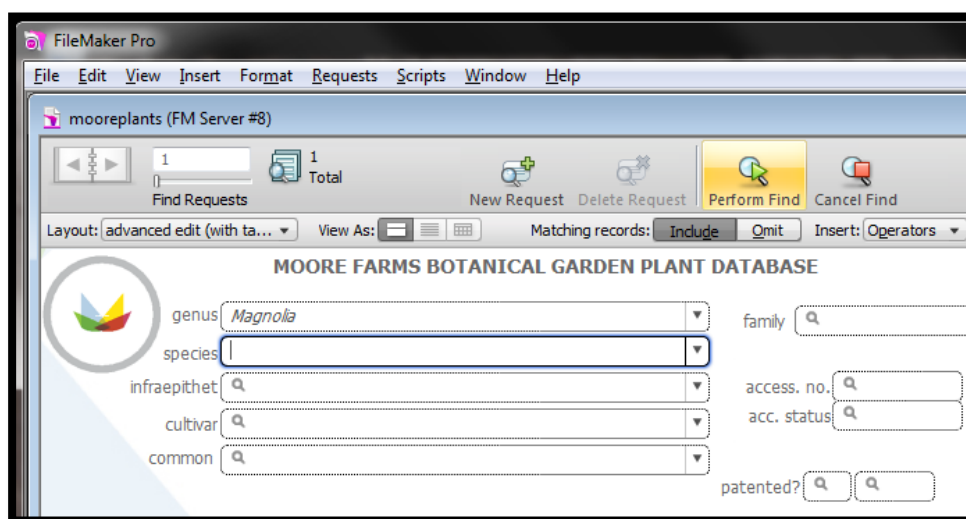
6. The layout will switch back to browse mode. Note the top menubar now displays the number of records found matching your criteria (386/8873).
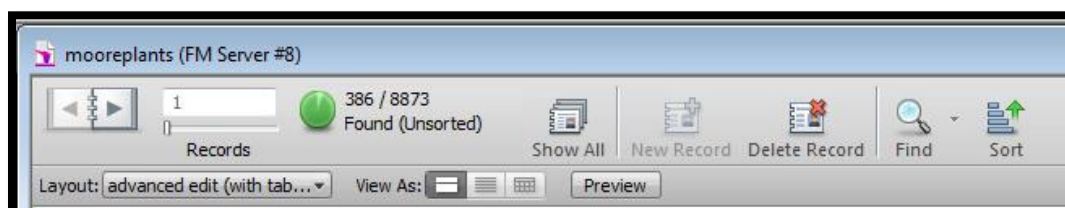
Accessioning a Plant

To be completed by Plant Recorder

1. Log into the Database with an assigned username and password (See **Logging in to the Database** pp. 15).
2. Push the "View or Edit Accession" button.
3. Push the "Create New Accession" button at the top of the screen.
4. Click "OK". Enter the proper accession number in the "access. no." field. *Note: For Lake City Accessions, enter an "l" instead of an "m" as the spacer*.

5. Fill out the nomenclatural fields in the top left of the layout as follows:
    a. Genus: With first letter capitalized
    b. Species: all in lowercase.
    c. Infraepithet (if needed): You will need to list the infraepithet rank followed by the infraepithet (i.e. var. virginiana or ssp. texanus)
    d. Cultivar: Enter the cultivar name without single quotes
    e. Common name: Enter an accepted common name, ideally one utilized in the Southeastern United States. Leave blank if there is none.

6. The family field should automatically populate, if not see **Assigning a Genus to a Family** (pp. 27).

7. If this plant represents a patent protected cultivar, enter the status and patent number in the patent fields.

8. Select the Source of the plant from the Source dropdown field. If the source is not listed, see **Adding a Source** (pp. 26).

9. Enter the provenance type of the plant. As this is a South Carolina wild collection, we will use one of the codes denoting the county of collection.

10. Enter the current location of the plant. The majority of the time, this will be "X-00 Production Center". However, if the plant was directly installed in the landscape, enter that location here instead.

11. Enter any relevant information about this accession in the "Initial notations" field. I typically use this to denote collections information.

12. If this accession represents a wild collection (or Germplasm from a wild collection), enter the collection coordinates if available.

13. Enter the date the plant was received, the number of plants received, and the size of the plants

14. The next four fields are for tracking cost. Costs are typically tracked in one of three ways depending on the plant

   a. **If the cost paid was per plant:**
      Enter the cost paid per plant in the "Unit cost" field and select "each" from the "per" field. The extended cost will be calculating by multiplying the unit cost by the number of plants.

   b. **If the cost paid was per packet:**
      This is typically used in seed orders, where you may receive 200 seeds in a packet, but you paid for the packet as a whole as opposed to 200 individual seeds. In this case enter the price of the packet in the "unit cost" field, select "per pkt" from the "per" field, and enter the number of packets in the "# pkts" field. The extended cost will be calculated by multiplying the unit cost by the number of seed packets.

   c. **if the plant was a donation or no money was paid in exchange for the plant**
      Simply select "no cost" from the "per" field.

15. Enter the intended use of the plant in the "Use" field. If this is a situation in which plants are purchased from the same source at the same time (and therefore may share the same accession number), and where some plants may be paid for on a DDM rather than MFBG account, repeat the previous step.

16. Switch to the "Locations and Notes" tab and locate the "Qualifer" field under the locations and notes heading. At this point, it is necessary to separate the accession into individual groups for more effective tracking. Typically each individual woody plant within an accession will receive its own qualifier, whereas each patch of perennial plants in a specific location will receive a qualifier. In this example, only one plant has been received so only one qualifier needs to be entered. Enter a "1" in the qualifier field.

17. Enter the location where this qualifier is located and the quantity of plants in that location.

18. Enter the size of the plants and the date they entered this location (this should match the initial size and location listed above)

19. The next four fields should automatically populate. They track whether or not the plant has a tag (defaults to no) whether or not the plant needs a tag (varies depending on current size of the qualifier), whether or not the plant has been GPS mapped (defaults to no) or whether or not the plant is alive (defaults to yes). Repeat this step for each qualifier accessioned.

20. Enter any remaining notes, and then select "completed" from the Acc. Status field.

Adding a Source

To be completed by Plant Recorder. This will need to be done during the accessioning process if the accession represents the first time plants have been obtained from this source.

1. In the "Initial Notations & Cost" Tab of the View & Edit Accessions Layout, click the button labeled "Add a Source"
2. Click the New Record Button
3. Enter the name of the source, along with the address, website, and other contact information if available.

Assigning a Genus to a Family

To be completed by Plant Recorder. This will need to be done during the accessioning process if the accession represents the first time this particular genus has been entered in the database.

1. In the "Initial Notations & Cost" Tab of the View & Edit Accessions Layout, click the button labeled "Assign Genus to Family"
2. Click the New Record Button
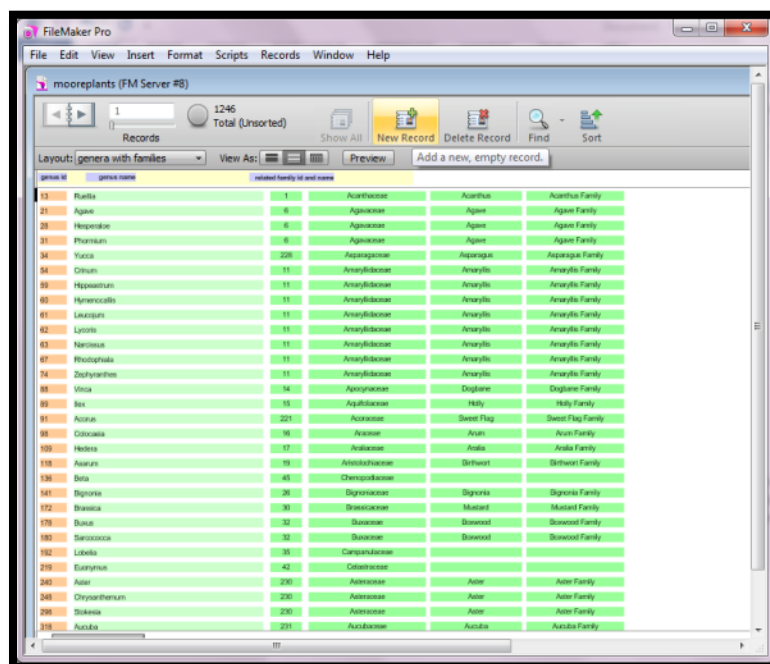
3. Enter the Genus in the "genus name" field
4. Select the Family from the Family dropdown. The remaining fields will automatically populate. If the appropriate family is not listed, you will need to add that in a separate layout. See **Adding a Family** (pp. 26).
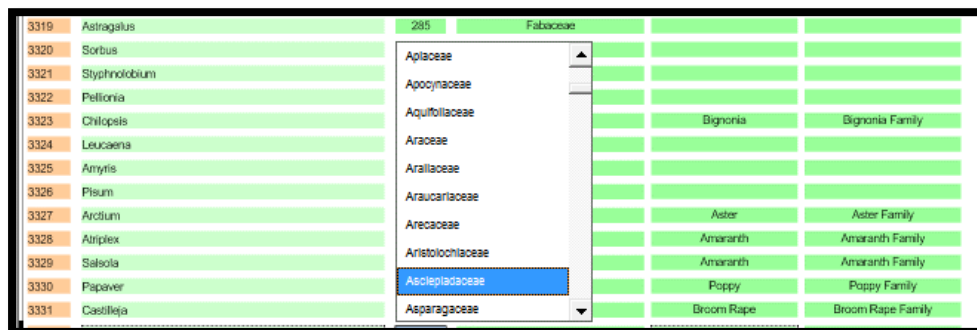
Adding a Family

To be completed by Plant Recorder. This will need to be done during the accessioning process if the accession represents the first time this particular genus and family have been entered in the database.

1. In the "Initial Notations & Cost" Tab of the View & Edit Accessions Layout, click the button labeled "Assign Genus to Family"
2. Click the "New Record" button
3. Enter the name of the Family in the "family" field.
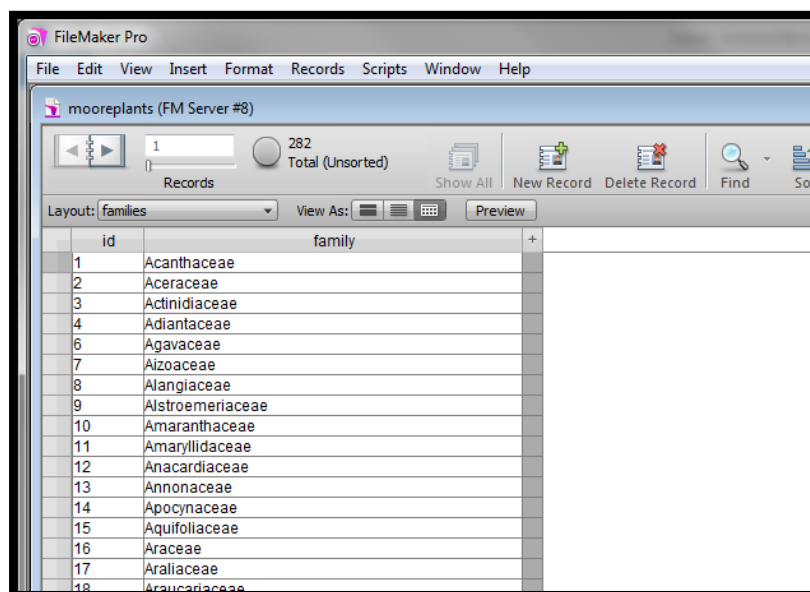
Engraving a List of Accession Labels
To be completed by Plant Recorder

1. Log into the Database with an assigned username and password. See **Logging in to the Database (pp. 15)**.
2. Under the "Print or Engrave Labels" Subheading, Click the "Accession" Button.

3. This will bring up the layout to export accession labels for engraving. The first step is to find all plants currently needing a label. Push the "Find all Plants Needing Labels" button in the bottom left of the screen.

4. To export the list, push the "Export Records as CSV" button

5. An "Export Records to File" dialog box will appear. The file location will default to the desktop. It is recommended to name the file in reverse date format (i.e. 2014-09-19 Accession Labels Needed). Keep the "Save as type" as a Comma-Separated Text File (CSV).
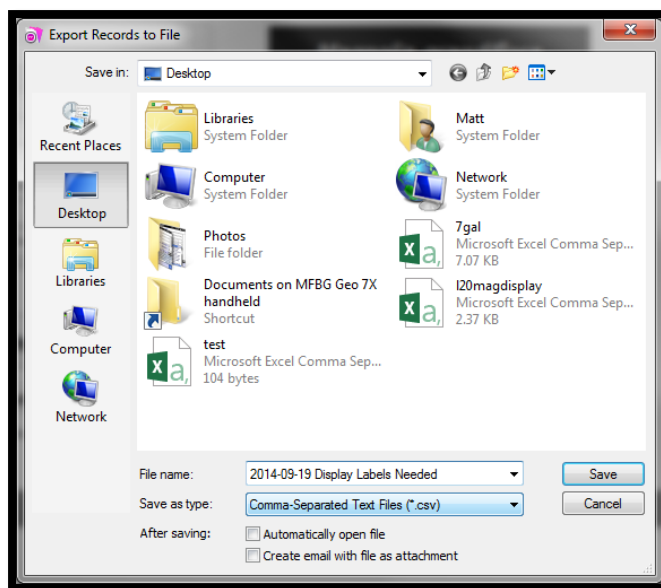
6. On the next screen, keep the default settings and click "Export"
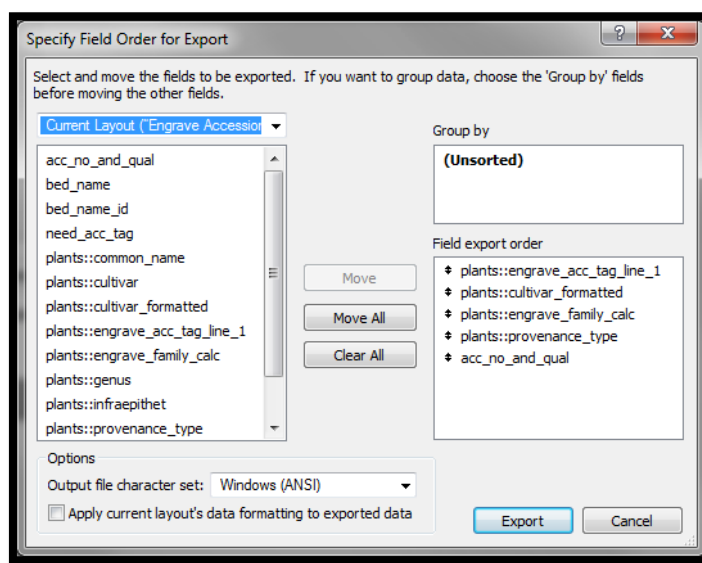
7. Open Roland's "Dr. Engrave" software. From the file menu, select "Open". In the "Templates" folder, select "accn_label_no_qr.det" (for labels without QR codes) or label_template (for those with QR codes). Click "Open". *Full file path is C:\ProgramData\Roland DG Corporation\Dr.Engrave\Template\accn_label_no_qr.det*
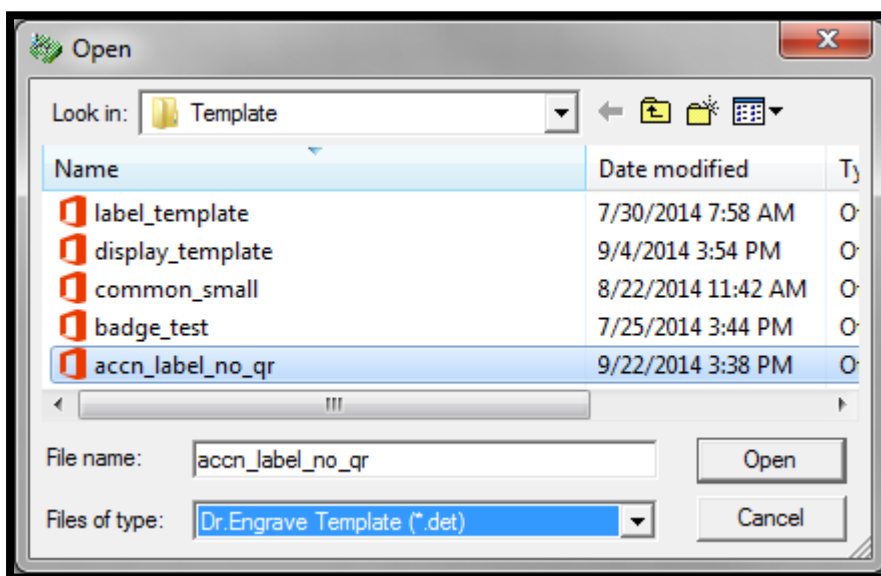
8. A template with spaces for five lines will appear. From the top menubar, select "Layout"
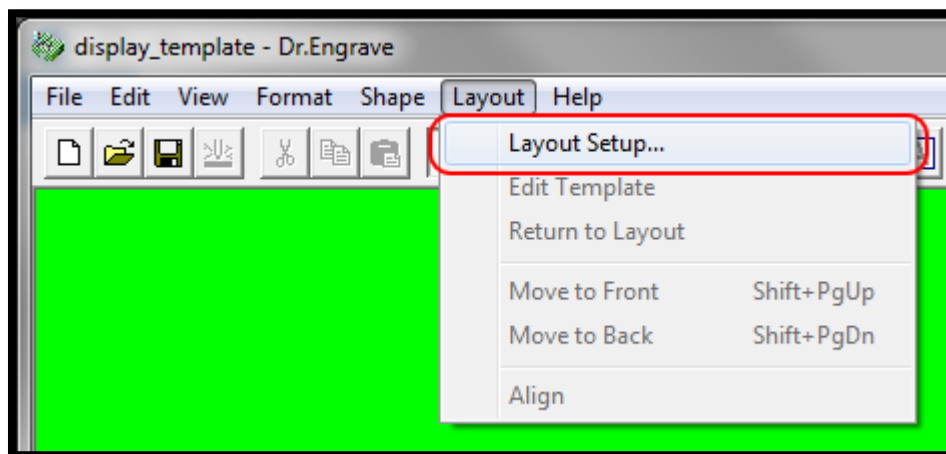
9. You will now specify how many of these plates can fit on the table. The template size is 1.06" × 3.5", the same as the accession labels. The dimensions of the Roland EGX-20 table are 6" × 8", so ten of these plates will fit on the table. Enter "10" in the quantity field. Click the "OK" button.

WORKING DRAFT: 10/2/2014: Complete save for Herbarium procedures
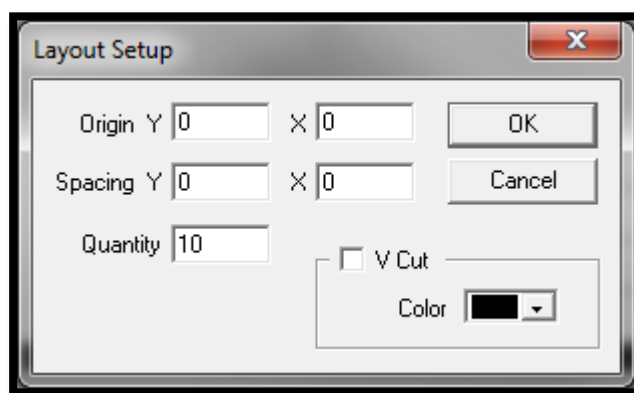
10. The layout will adjust to show an arrangement of 10 plates. Under the main menubar, select "File" then "import text"
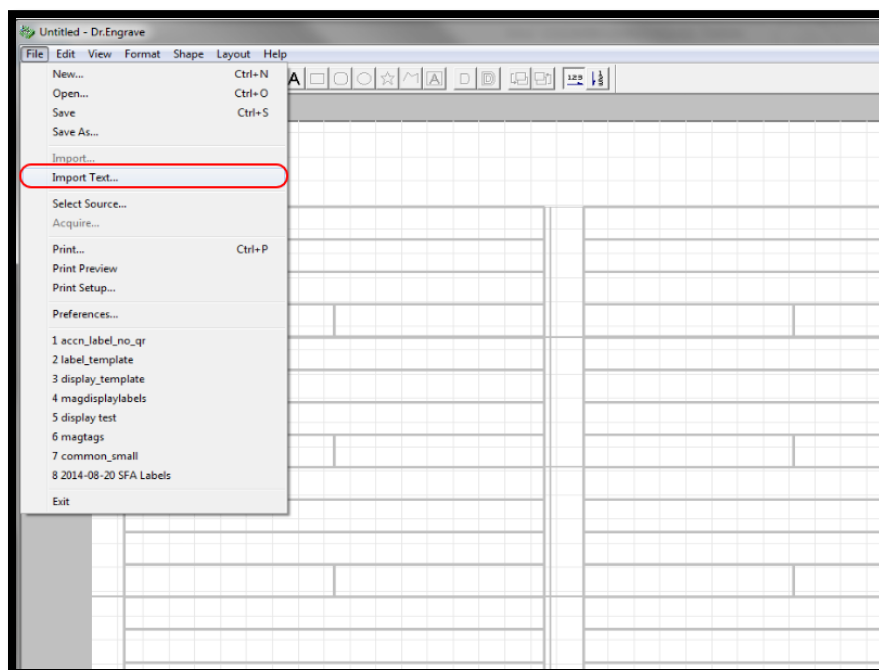
11. Ensure that "Comma" is checked as the field separator, then push "Next".
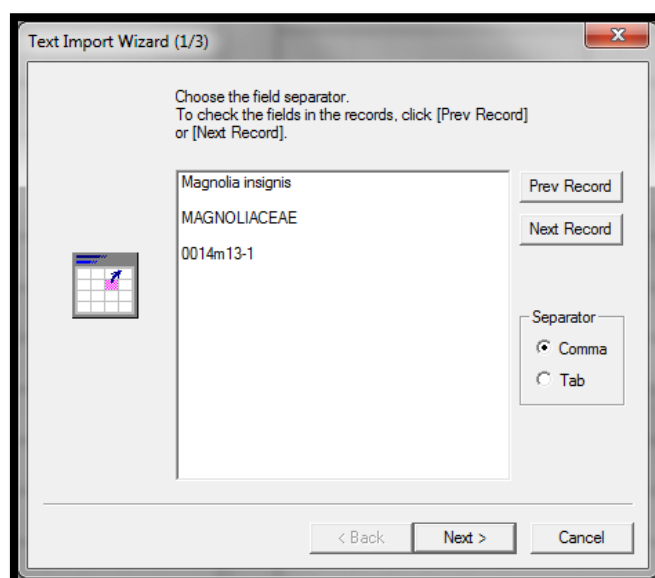
12. Push the "Auto Layout" button. The scientific name should appear in field 1, the cultivar name (if there is one) in field 2, the family in field 3, the provenance code in field 4, and the accession number in field 5. Then push next.
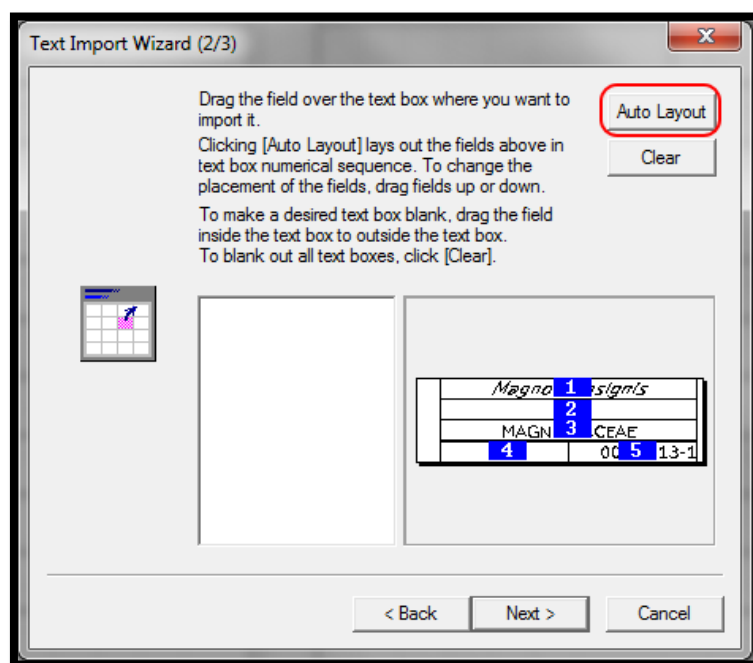
13. Push "Select All", then "Finish.
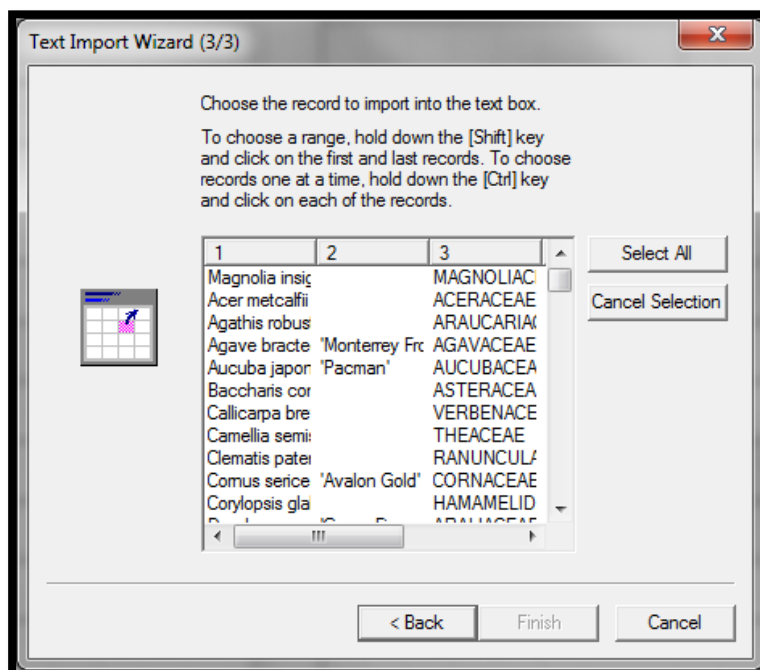
14. The layout produced in step 9 will now be automatically populated by the imported text. As more than ten labels are needed, Dr. Engrave has broken this job into multiple "pages". The active page and total number of pages can be observed by viewing the lower status bar.
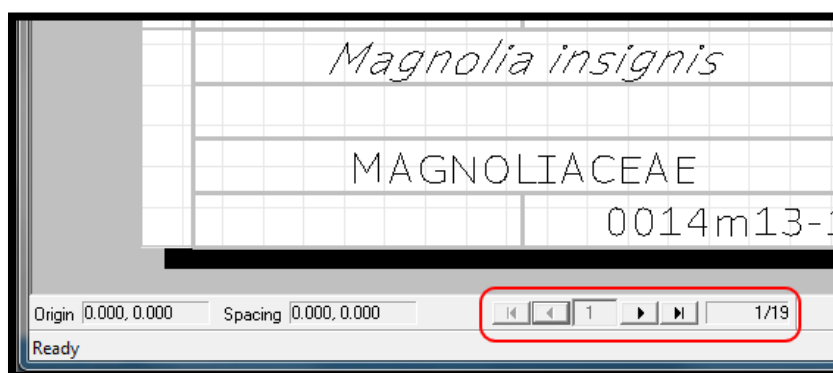
15. Next, ensure that all text imported is within the confines of the template. Text that is too long can be shortened either by reducing the character spacing, or by reducing the font height. The line highlighted below will need to be reduced.
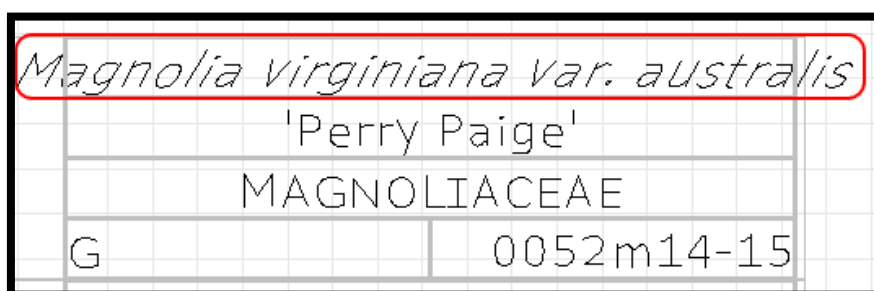
16. Push the "Draw Text" button on the top toolbar, then double click the line to highlight it.
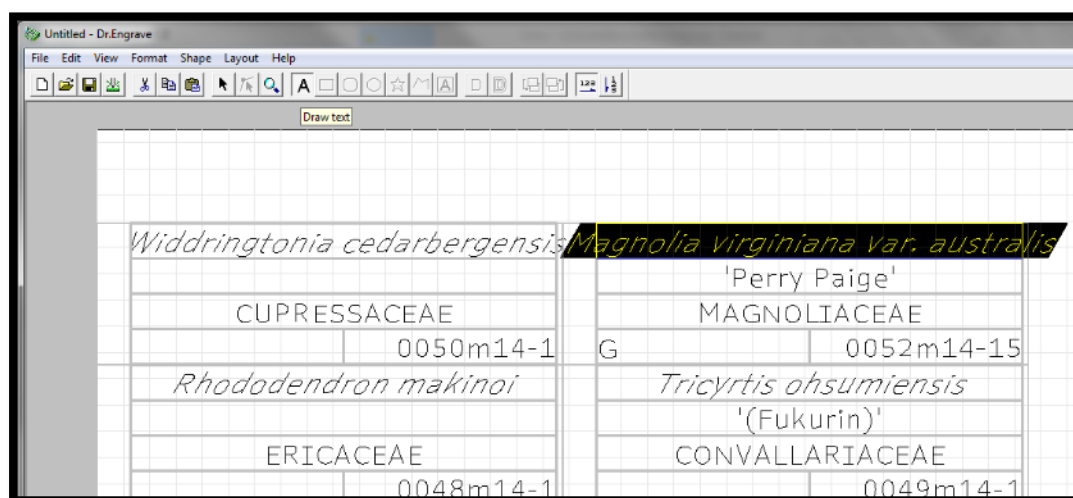
17. To reduce the character spacing, select "Format" from the top menubar, then "Spacing". Select the highest number that allows all text to fit within the boundaries (in this case, 0.8).
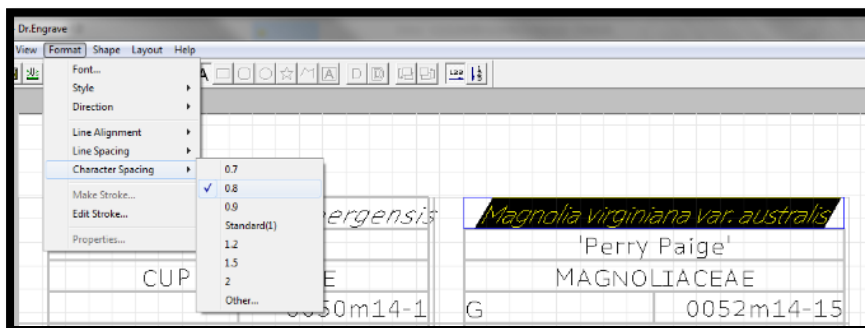
18. If reducing character spacing is insufficient or results in illegible text, reducing the font height may help it fit. Select "Format" from the top menubar, then "Style", and then "Other".
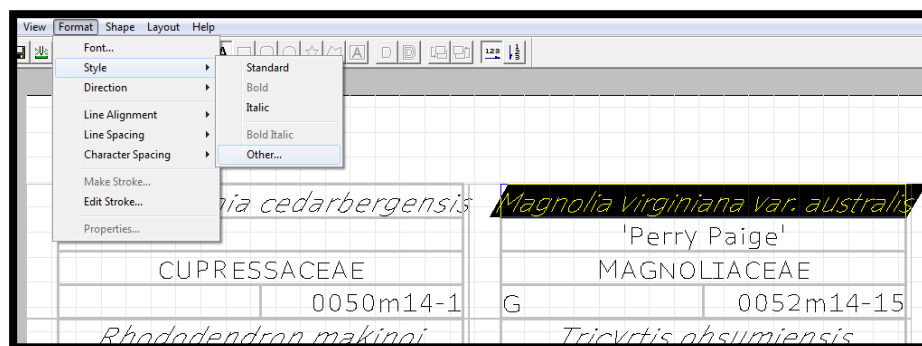
19. Specify a lower font height in the "Text Height" field. In this case, a height of .19 will result in the entire text fitting in the confines.

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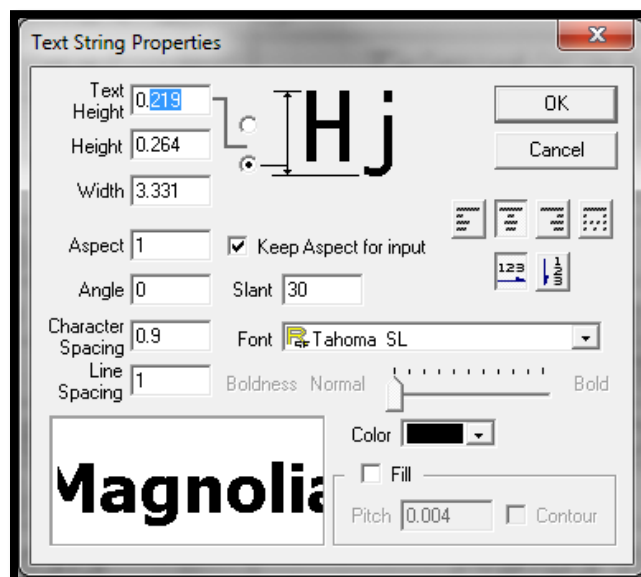
19. Review that all text is now within the boundaries, and set the accession labels on the engraver table. Push down firmly to secure the labels to the adhesive sheet. Push the "View" button on the engraver to move the table into the engraving position. Ensure that the **C2-125-DGK** cutter is installed (Diamond Graver Non-rotary 1/8" shank w/knob). Select File, then Print.
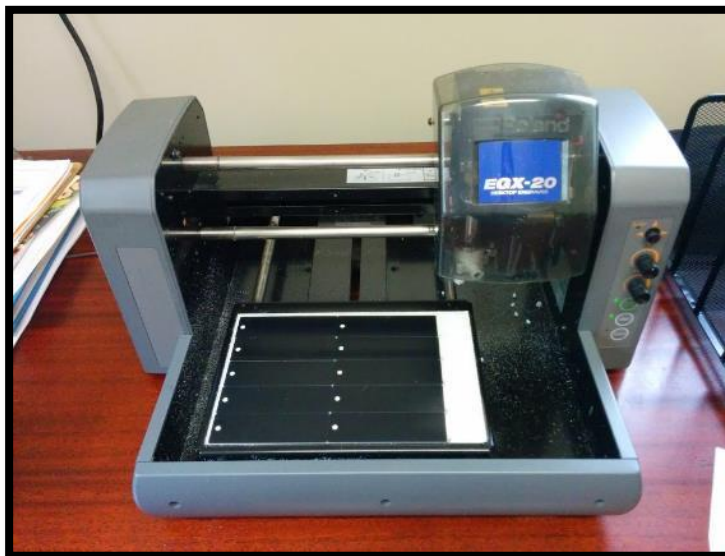
20. The engraver will now turn on. After several minutes, the procedure will complete. Check all the labels for accuracy. In some cases, it may be necessary to engrave a second pass. If so, repeat steps 19-20.

21. If more than 4 labels were selected for export, when engraving is complete, the print driver will produce a dialog box that says "Outputs 2 Page, change please". In this case, remove the completed labels, reload the blank plates, and push "Yes".
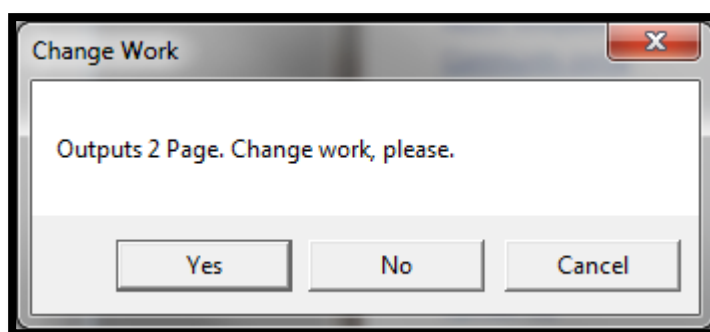
22. Back in Filemaker, click the "Clear Label Requests" Button.

23. For labels utilizing QR codes, generate them on any free online site allowing export of plain text QR codes (i.e. http://qrcode.kaywa.com/).

24. Type the accession number and qualifier into the field in the following format: 4 digit serial number, spacer, 2 digit year, hyphen, serial qualifier (i.e. 1000m14-1). Ensure that the option to create a text code is selected.

25. Push the generate button. Copy the QR code and paste it into Microsoft Word or the program of your choice.

26. Resize the code image to 1" × 1".
27. Once an entire page of these have been generated, load a printer with Avery Weatherproof Shipping Label paper (Inkjet or Laser depending on the printer). Print the codes on this label paper.
28. Cut each code out and affix it to the right-hand side of the accession label.

Engraving a List of Display Labels

To be completed by Plant Recorder

1. Log into the Database with an assigned username and password. See **Logging in to the Database (pp. 15).**
2. Under the "Print or Engrave Labels" Subheading, Click the "Display" Button.

3. This will bring up a layout to prepare a list of display labels for engraving. The fields on the left under the "Search for Plants" heading can be used to bring up records corresponding with a particular plant. The most precise way to search for a plant is likely to enter its accession number in the "Accession Number and Qualifier" field.

4. In the "Needs Display Label" Box, set the radio button to "1 Yes" if the plant needs a label. Continue until all plants currently needing a display label have been indicated as such.

5. Click the "Find all Plants Needing Labels" button. This will create a found set with all the plants currently needing labels.

6. Click the Export Records as CSV button.
7. An "Export Records to File" dialog box will appear. The file location will default to the desktop. It is recommended to name the file in reverse date format (i.e. 2014-09-19 Display Labels Needed). Keep the "Save as type" as a Comma-Separated Text File (CSV).

8. An "Export Records to File" dialog box will appear. The file location will default to the desktop. It is recommended to name the file in reverse date format (i.e. 2014-09-19 Display Labels Needed). Keep the "Save as type" as a Comma-Separated Text File (CSV).

9. On the next screen, keep the default settings and click "Export"
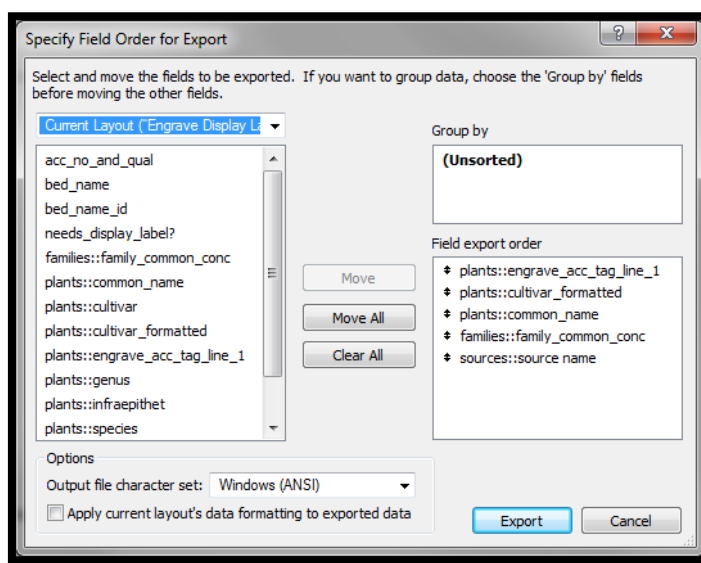
10. Open Roland's "Dr. Engrave" software. From the file menu, select "Open". In the "Templates" folder, select "display_template.det". Click "Open". *Full file path is C:\ProgramData\Roland DG Corporation\Dr.Engrave\Template\display_template.det*
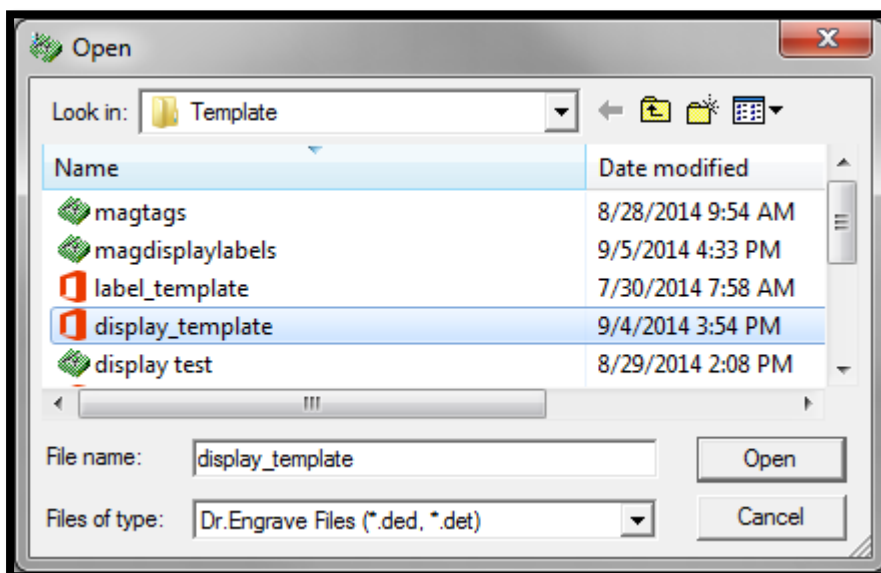
11. A template with spaces for five lines will appear. From the top menubar, select "Layout"
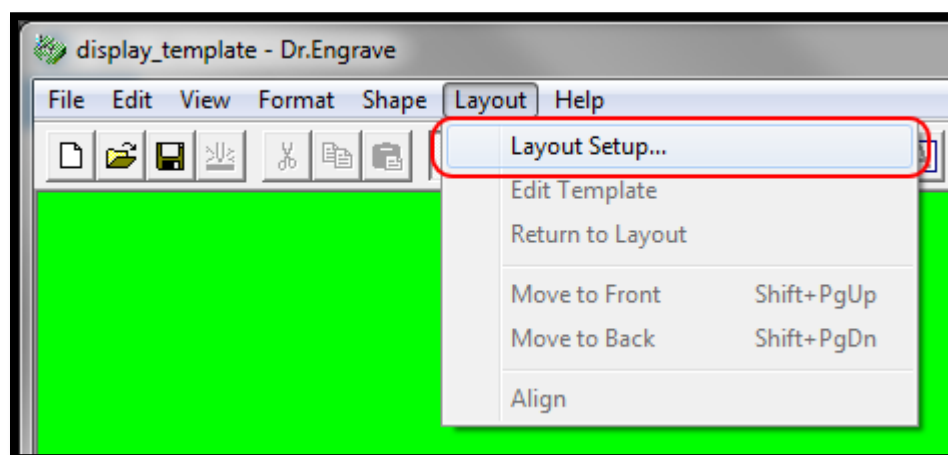
12. You will now specify how many of these plates can fit on the table. The template size is 3" × 4", the same as the display labels. The dimensions of the Roland EGX-20 table are 6" × 8", so four of these plates will fit on the table. Enter "4" in the quantity field.
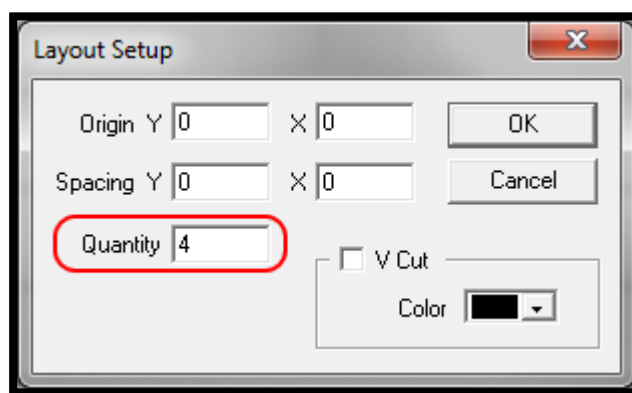
13. Now four plates will be shown on screen. From the top menubar, select file and then "Import Text."
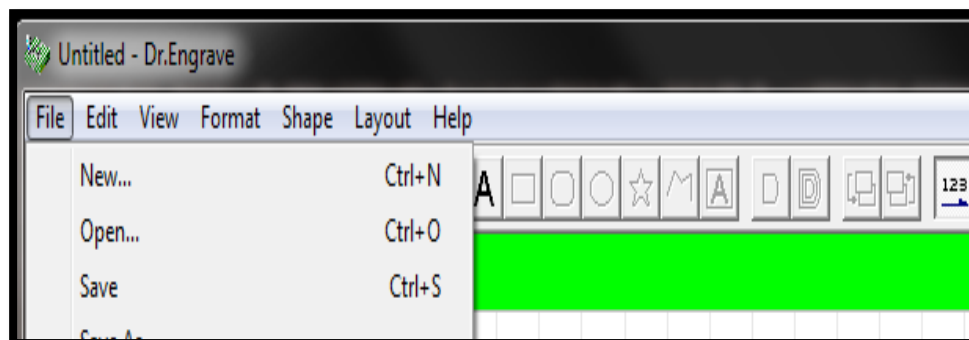
14. Select the file and click open. Next, ensure that the field separator is set to comma. Push the "Next" button
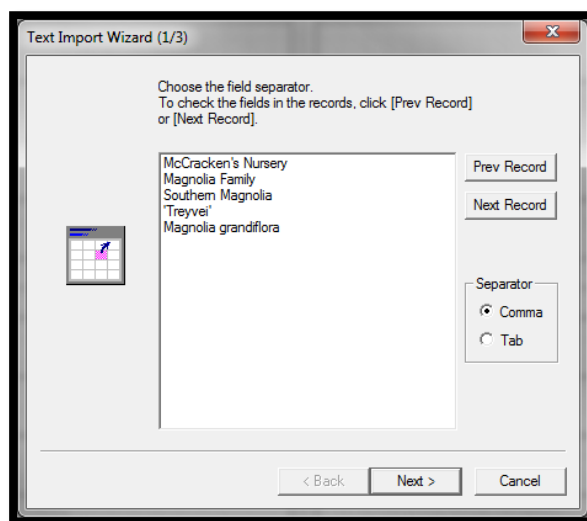
15. Push the "Auto Layout" button in the top left, and then verify that the fields are imported in the correct order by reviewing the preview plate layout. Push the "Next" button when complete.
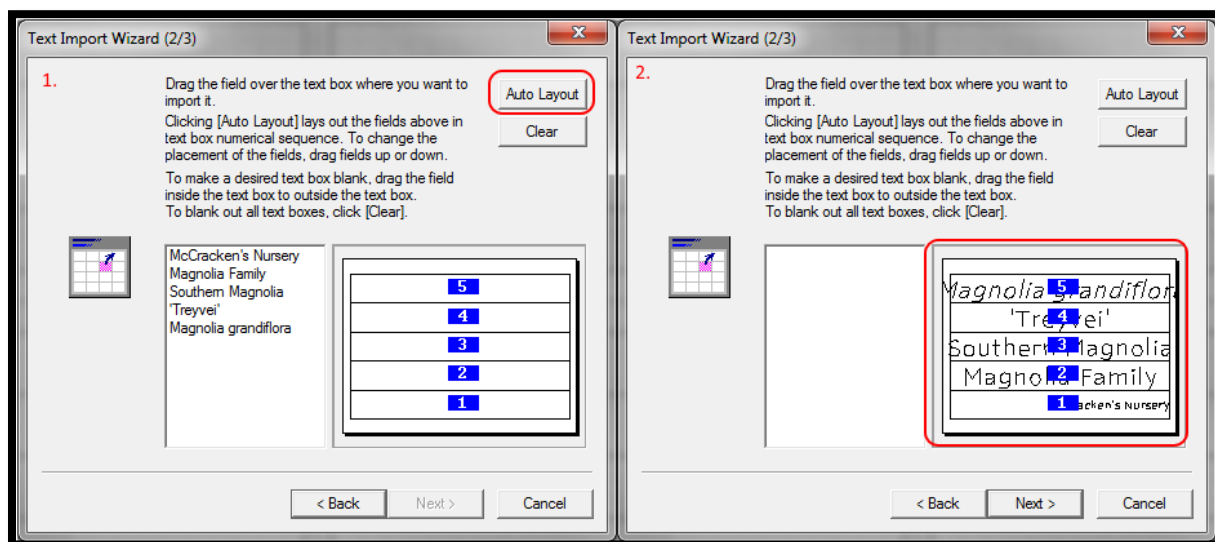
16. Click "Select All" and then "Finish"
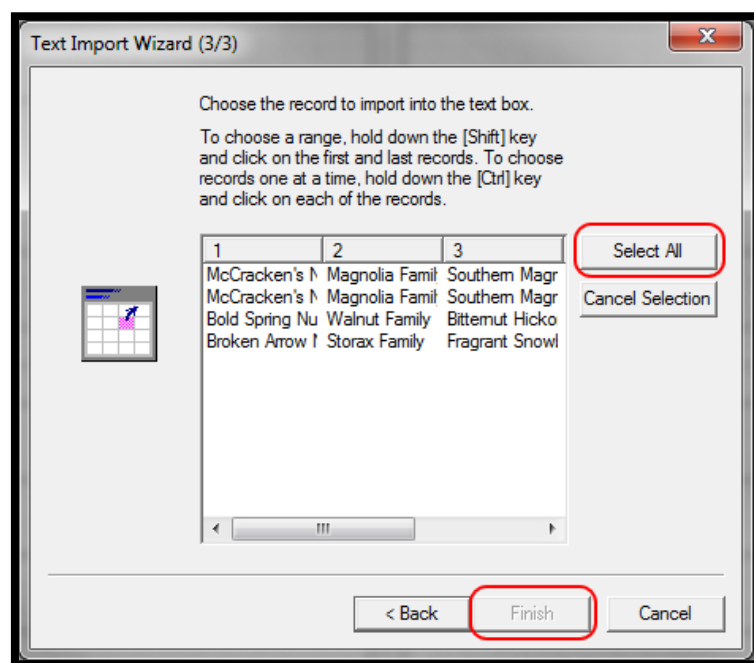
17. The layout will now show the imported text. Note that in some cases, the text is outside of the grey boundaries of the text field. This will need to be corrected in order for the engraver to function properly. There are two ways to complete this. Either by reducing the character spacing to squeeze more letters in a screen (Step 17), or by reducing the text size (Step 18).
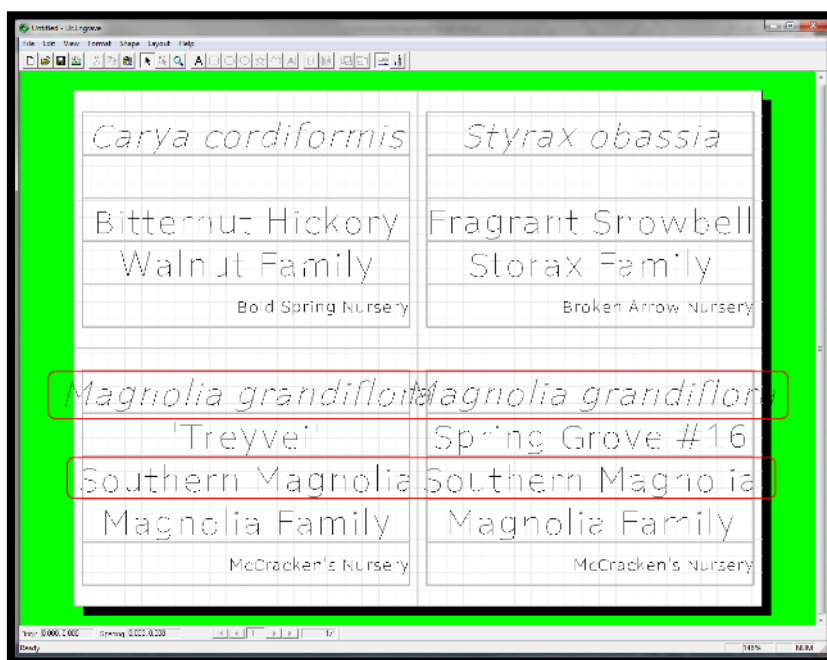
18. To reduce the character spacing, first ensure that the text tool is selected in the menubar. Next, double click on the line of text you wish to reduce to select it. Finally, select "Format" from the top menubar, and then "Character Spacing". Select the highest possible number that will allow the text to fit within the text field (so the minimum possible spacing). In this case, "0.9" will be sufficient.
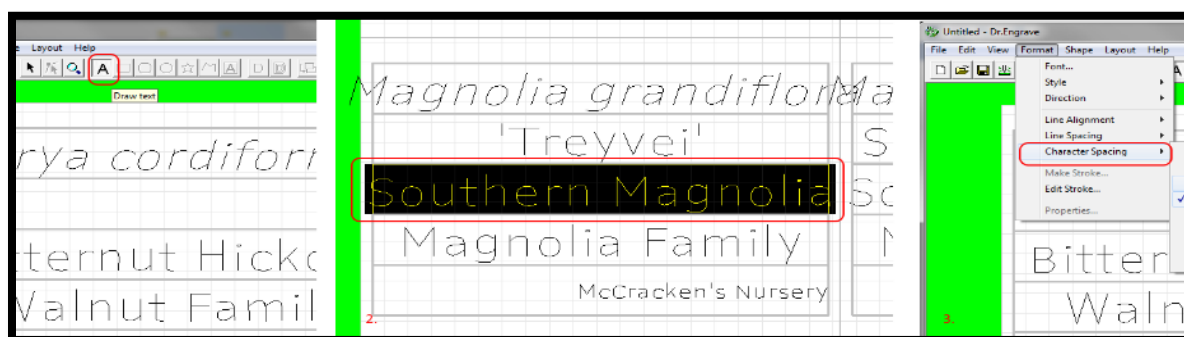
19. To reduce the font size, follow the steps above to highlight a line of text. Next, select "Format" from the top menubar, then "Style", then "Other". The "Text String Properties" dialog box will appear. From here you can reduce the text height to a setting which will fit.
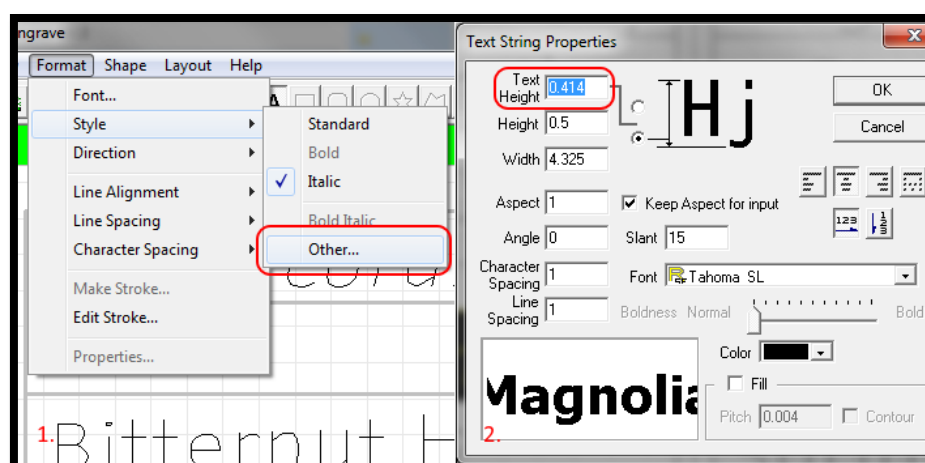
20. Review that all text is now within the boundaries, and set the display labels on the engraver table. Push down firmly to secure the labels to the adhesive sheet. Push the "View" button on the engraver to move the table into the engraving position. Ensure that the **C2-125-030K** cutter is installed (Carbide Engraving Cutter, .030 tip, 1/8" shank). Select File, then Print.
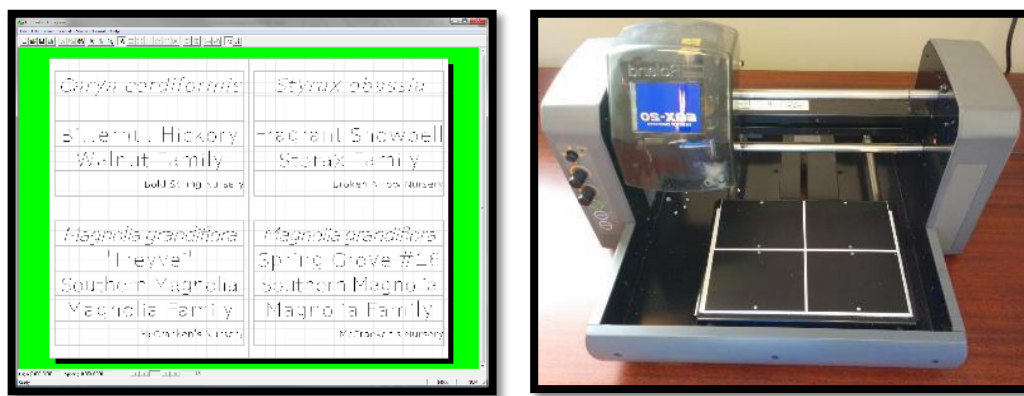
21. Click the "Properties" button. Select the "Tool Tab". Ensure that ABS plastic is set as the material. Personally, I find these labels are engraved best if the "Z Down Position" setting is changed to "-.35". This will result in multiple, deeper passes which seem to engrave well through the top layer of plastic. When complete, click OK to close the properties window, and then "OK" to close the print window.
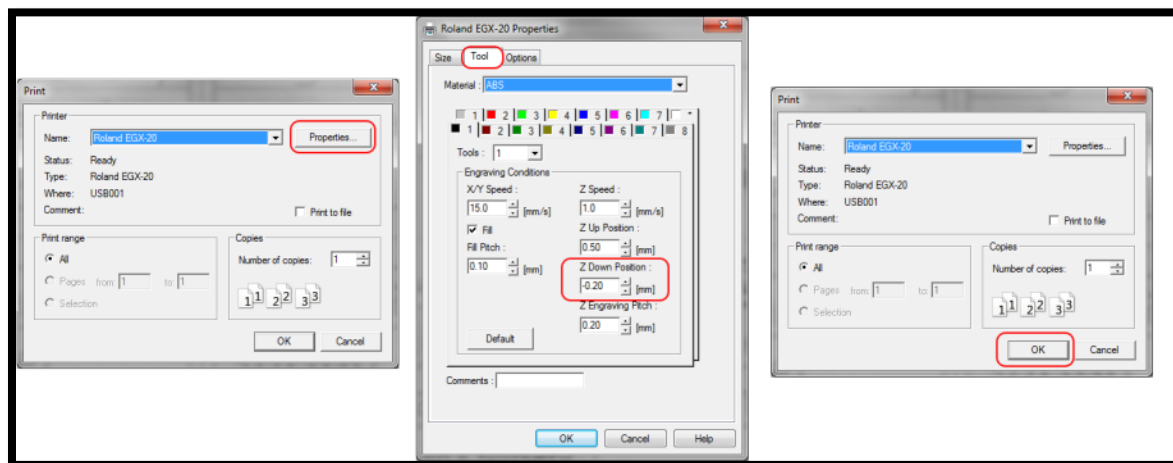
22. The engraver will now turn on. After several minutes, the procedure will complete. Check all the labels for accuracy. In some cases, it may be necessary to engrave a second pass. If so, repeat steps 19-20.
23. If more than 4 labels were selected for export, when engraving is complete, the print driver will produce a dialog box that says "outputs 2 page, change work". In this case, remove the completed labels, reload the blank plates, and then push "yes".

24. Back in Filemaker, click the "Clear Label Requests" Button.

Recording Planting

To be completed by Horticulture Supervisor, Research Horticulturist, Horticulturist, or any other staff-person responsible for maintenance of a garden area.

1. Log into the Database with an assigned username and password. See **Logging in to the Database (pp. 15)**.
2. Push the "View or Edit Accession" button.
3. Ensure that the "Locations & Notes" tab is selected.

4. Under the "Qualifier" heading, locate the row corresponding to the plant you have just installed. This will correspond to the final digit on the engraved accession tag (i.e. for 0990m14-3, the qualifier is 3). If unable to determine the qualifier, contact the plant recorder.

5. Click in the "location" field to the right of the qualifier and change it to reflect the new location of the plant.

6. Click in the "date planted" and change it to reflect the current date.

7. Enter any relevant notes about the planting (See **Entering a Note** pp. 82).
8. Photograph the plant and add the image to the database (See **Adding an Image** pp. 89)

Mapping a Plant

To be completed by Plant Recorder

For all operations, be sure that both the ArcPad Data Manager and Trimble Positions Desktop extension are installed and activated.
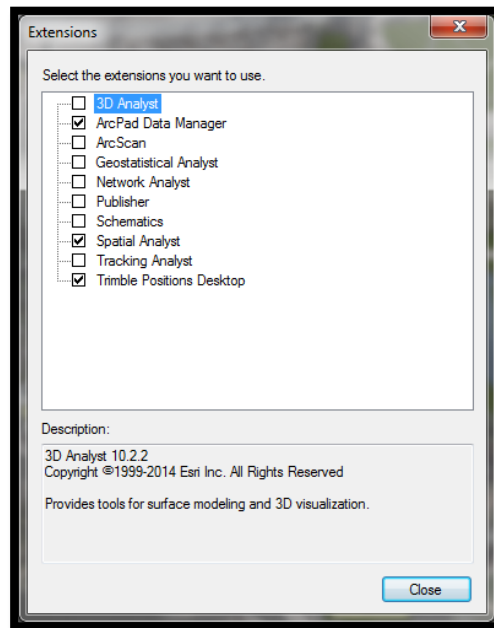
Exporting Data from ArcGIS (PC) to ArcPad (Geo7X)

1. Click the Trimble icon (highlighted below) to bring up the Trimble Positions Desktop Administration window.
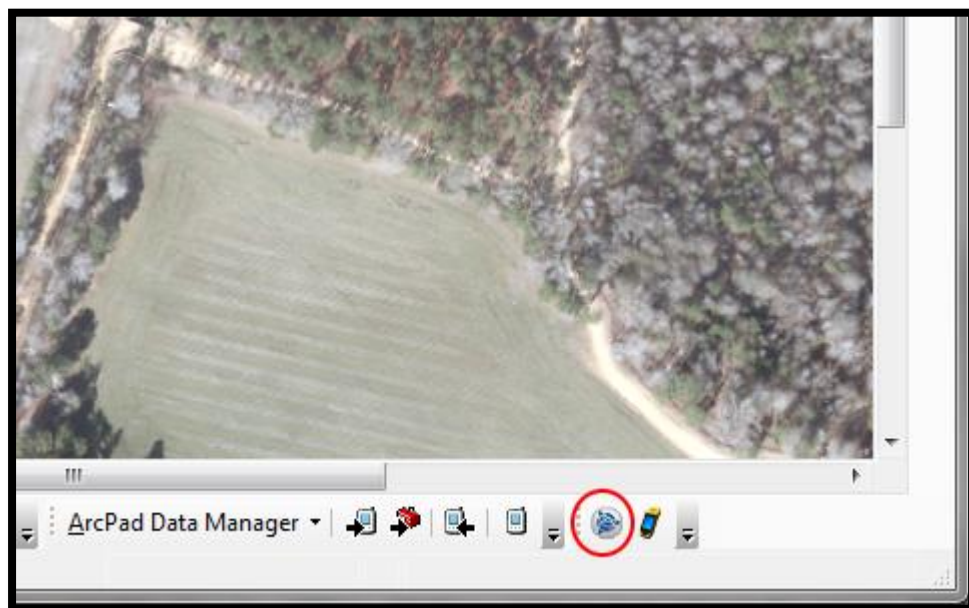
2. Click the projects button.
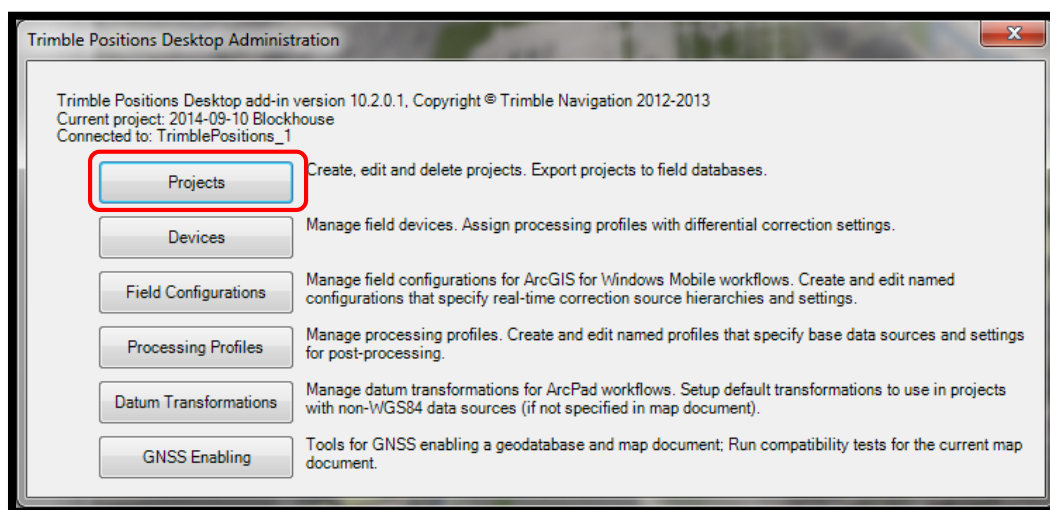
3. The green highlight indicates the currently active project (Only one project may be active at a time). To create a new project, click on the Create button in the bottom left corner. A drop down menu will appear. Select the first option and click "Create ArcPad Project".
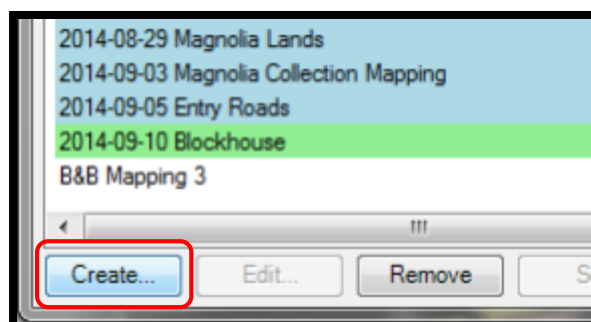
4. Title the ArcPad project in the Project Name field. For consistency and easiest sorting, name the project in reverse date format (i.e. 2014-09-22 Blockhouse). As this same title will be used later, it is advisable to copy it (Ctrl C) for later use in this process. Next, be sure to have Moore Farms Botanical Garden GIS 1.04.gdb selected under Feature classes in geodatabase workspace. Finally, click "Create" in the bottom right.
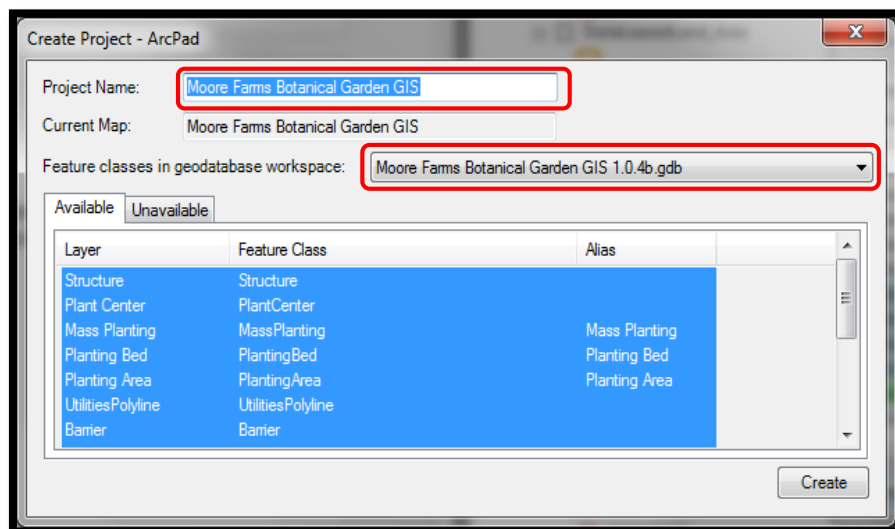
5. Paste (Ctrl P) the project title from the last window into the Project Name field. Under project layers select Plant Center, which will highlight in blue. Enter "1" in the field labeled Accuracy Threshold Horizontal (m). Click the drop-down menu under "Horizontal Estimated Accuracy (m)" and select "HorizontalEstimatedAccuracy". This will instruct the GPS Unit to take the estimated accuracy of each point and enter it in a field in the Plant Center table called "HorizontalEstimatedAccuracy". Positions in which the accuracy for a point is greater than 1 meter will be rejected. Select Finish when complete.
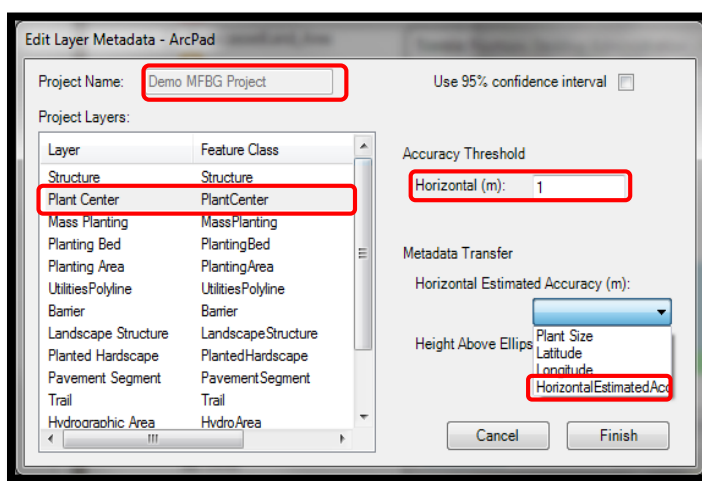
6. A pop-up window will appear confirming the creation of the project. (It may be a few moments before it appears). Push "OK".
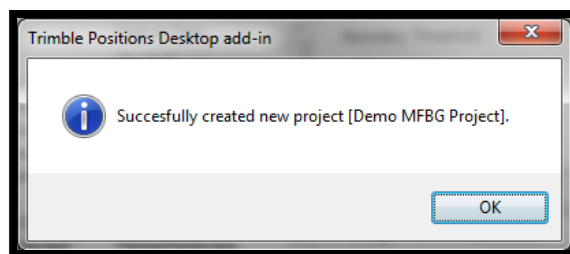
7. The project is now created. Check that it is active (highlighted in green). Click OK to exit the window.
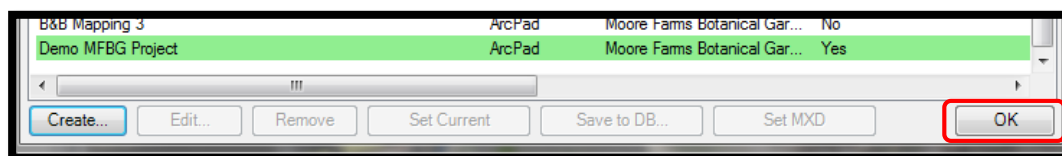
8. Now, data may be exported to the GPS Unit. Click the icon resembling the data collector (highlighted below) to open the Trimble Positions Desktop Dockable Window.
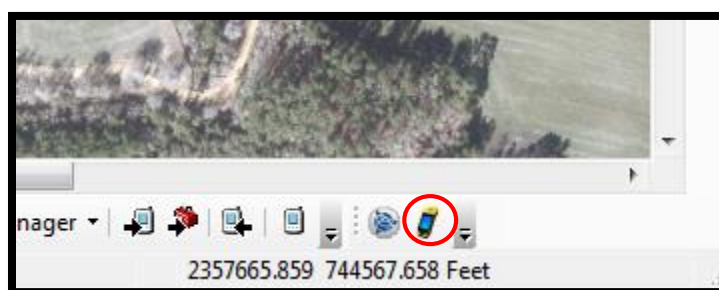
9. Due to RAM limitations on the Trimble Geo7X, the entire aerial photo should not be exported. For this reason, it is generally easier to confine your mapping to one specific location or garden area at a time. Zoom and pan to the extent you plan to GPS by scrolling. The currently visible extent will be exported to ArcPad.
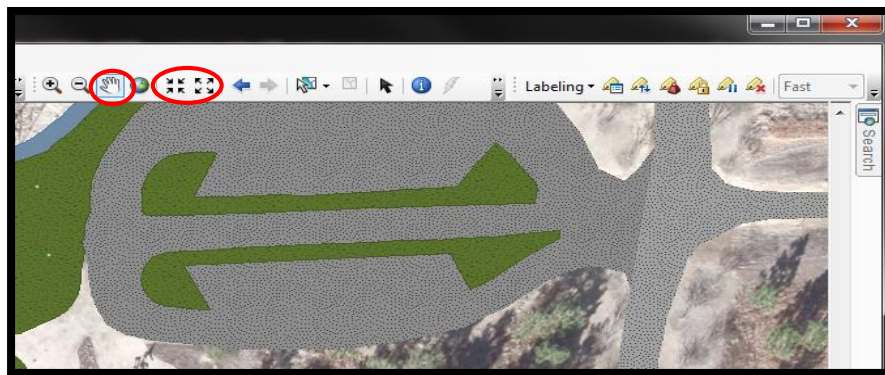
10. Now that the extent is selected, the project is ready to be exported. Confirm in the Trimble Positions Desktop window that your current project is selected. Then click the Check Out/In button and then click Check Out to ArcPad option from the drop-down menu.
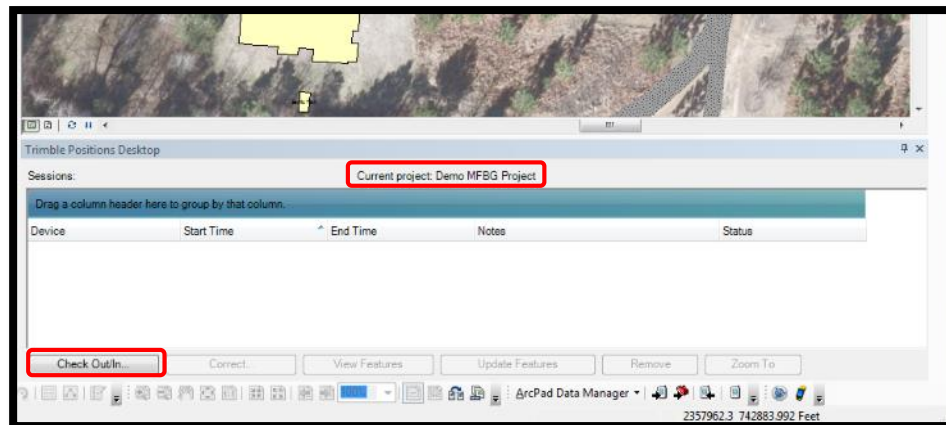
11. Select the desired data to export. For the purposes of mapping plants, under the Layer tab select Plant Center and select the black arrow under the Action tab. Click Check Out for disconnected editing in ArcPad and then Schema Only (start with blank data set) from the drop-down menus. Repeat this process for "Mass Planting" and additional layers to edit. Next, select Aerial Photography 2011 and select "Export Background TIFF" under the Action tab drop-down menu. The layers selected will be verified as a check marks to the far right. Once complete, click Next.
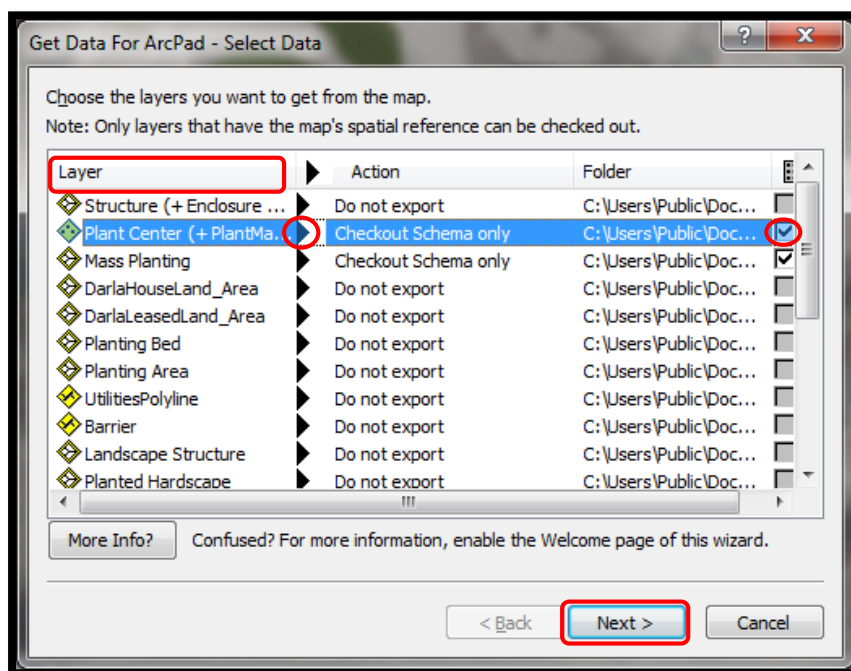
12. A window will appear called "Get Data For ArcPad- Select Picture Options". Ignore this and select Next.
13. Check the box labeled "Create an ArcPad map (.apm file) for the data". Paste the name of the project (copied from the Create Project step) both into the field labeled "Specify a name for the folder…" and "Map name:" Click Next to proceed.
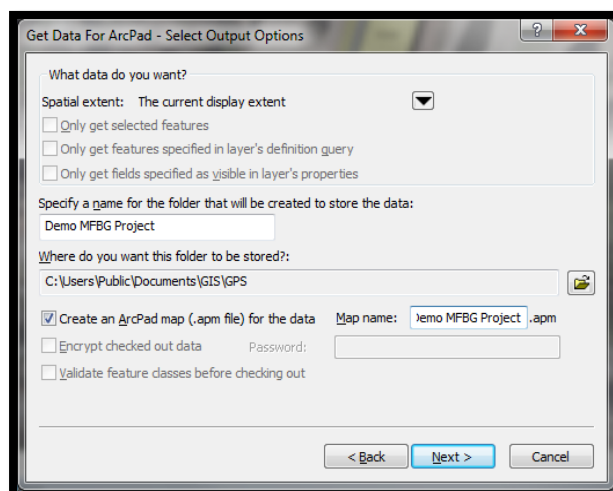
14. Select "Finish" and "OK" in the next two windows.

15. Navigate C:\Users\Public\Documents\GIS\GPS. The exported data will be located here. Copy the project folder.
16. Power on the Trimble Geo7x and plug it into the computer using a USB cord.
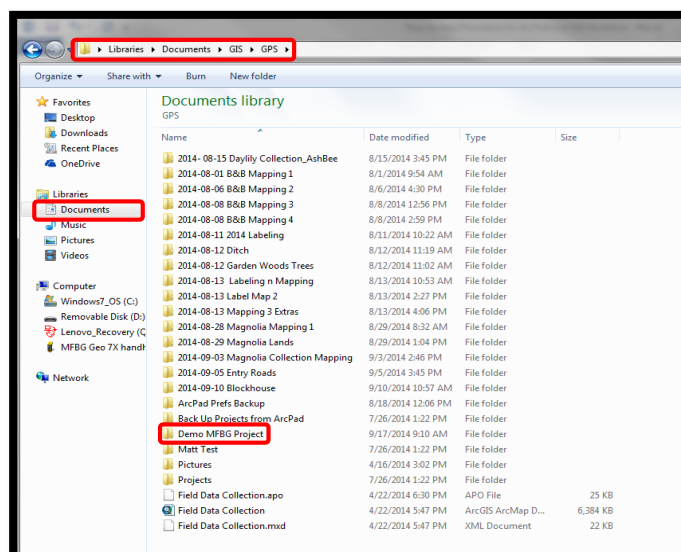
17. Navigate to "Computer\MFBG Geo 7X handheld\\\My Documents" and Paste the Project Folder.
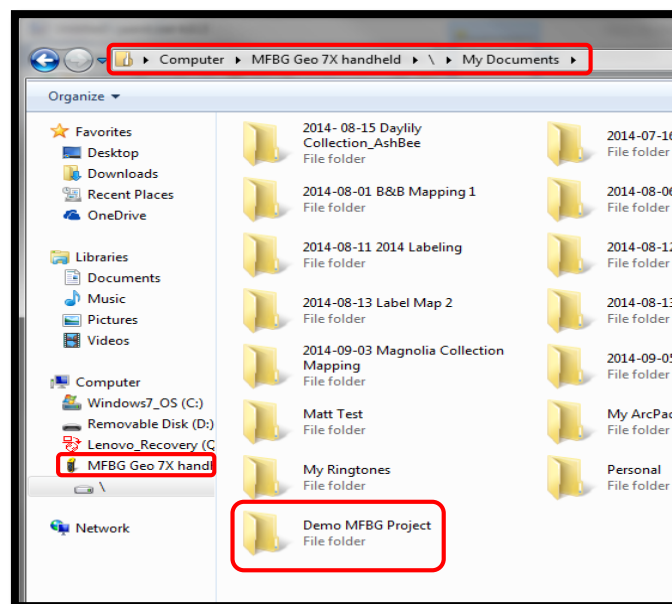
18. Unplug the GPS Unit and head into the field.

Mapping in the Field

Calibration & Setup

Turn on the GPS Unit with the center green button. Make sure that the correct date & time is set. The battery in the GPS unit will tend to drain whenever installed. This can result in the unit going dead and restoring the date and time to the factory defaults. If the current date and time is not correct, it can be set manually.

1. Press in the upper menubar of the Geo7x main screen. A row of icons will appear. Scroll to the right, then push the clock icon which appears.

2. Set the correct date and time, then press "OK".
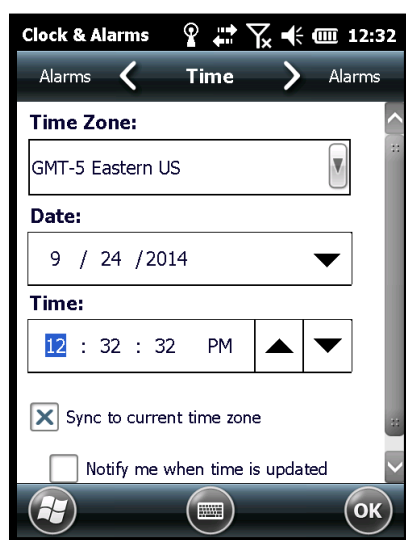
3. Before using the GPS unit, it will need to be calibrated. This should be done in the area of the garden you plan to map and as far away from any buildings, electronics, etc. as possible (Reference Trimble Support Note 11/5/13: **Geo7x Handheld: Orientation Sensor Calibration**).
4. To enter into Calibration mode, select the silver square and tool icon on the Home screen.

5. The menu screen for Sensor Calibration will appear. There are two options, Fast Calibration and Full Calibration. The Fast Calibration is time-efficient while the Full Calibration gives a more in-depth reading of the device's coordinates but takes more time. Do the calibration recommended by the device (in this example, Fast Calibration is recommended).
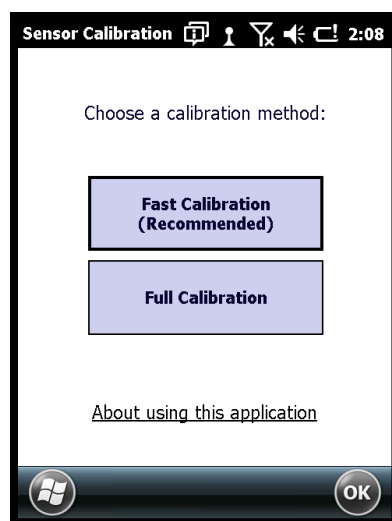
6. Now that Fast Calibration has been selected, the Instructions screen pops up. Spin and rotate the device in all directions as if the center was on one axis. Continue this with the calibration sounds until you here a loud ping.

7. One of the two screens below will display. If the calibration failed it will say "Calibration failed". If this displays select "Try again?" and re-do the process. Sometimes the weather or canopy cover can interfere with the calibration process. If the process is successful, select "OK"
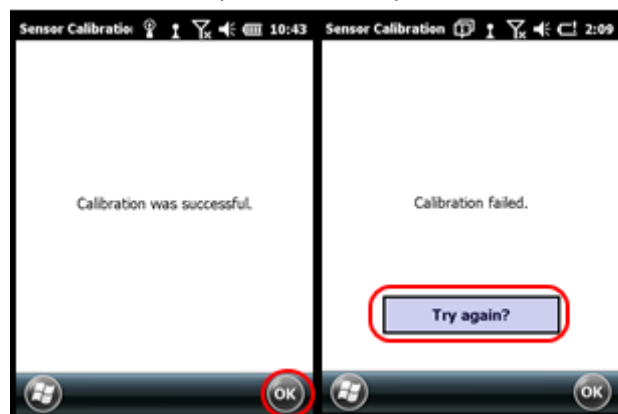
8. If Full calibration is recommended, reference **Trimble Support Note 11/5/13: Geo7x Handheld: Orientation Sensor Calibration**.

9. Return to the home screen and Open ArcPad

10. Open the map project created earlier.
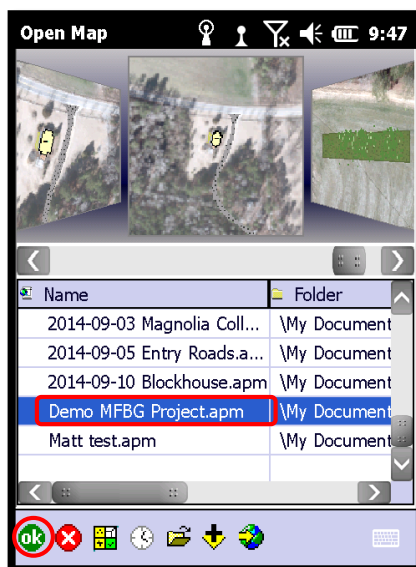
11. This SQL script error can be ignored.
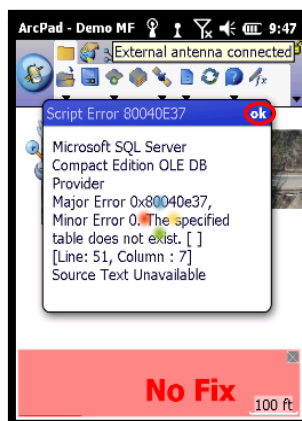
12. The device will start searching for available satellites to determine a position. To view the accuracy of your position, click the trimble icon in the trimble toolbar.
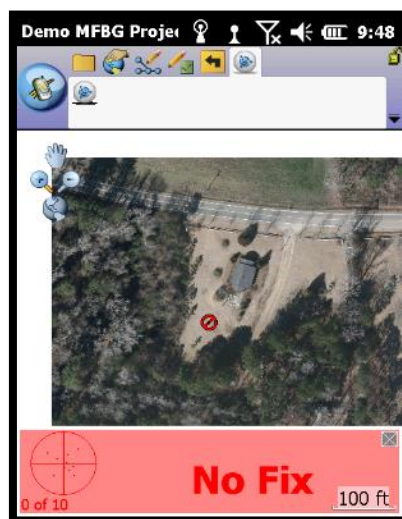
13. The Trimble Positions Skyplot layout pops up and illustrates the placement of satellites surrounding the unit's current location. Preferably, wait for the accuracy to reach at best 4.0 inches before mapping. A range of 4.0- 5.0 in are also acceptable, especially in cloudy conditions and heavy canopy cover. It's highly recommended to return to this layout while mapping in such conditions to assure the best accuracy possible. Below shows the process of connecting to various satellites. (Note that the 4.0" accuracy displayed in the final step here is the estimated accuracy following import and correction of the data). If you are unable to reach the required accuracy, you will likely need to take the point as an offset. See **Mapping an Offset Position** (pp. 72).
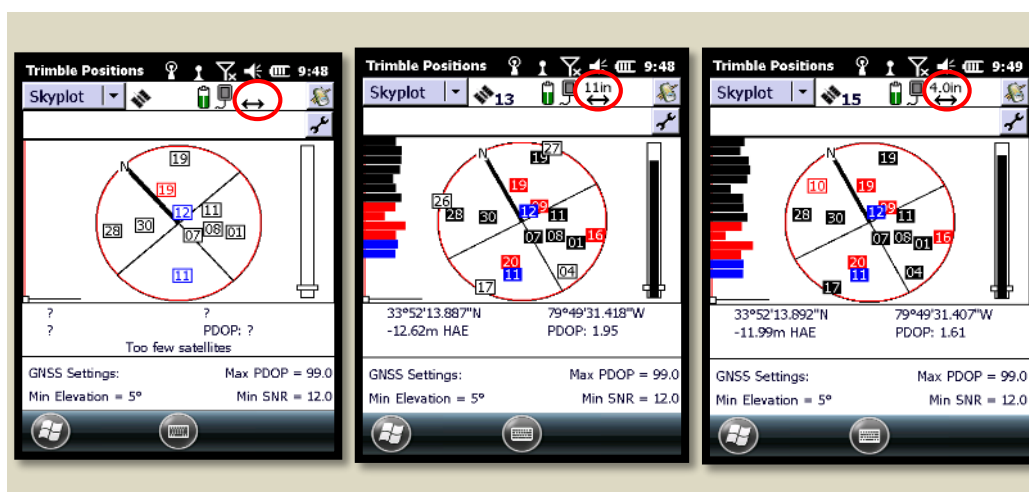
Positions taken with the GPS may be in either Point form (for a single plant) or Polygon (for a mass planting). In some cases, (utility lines) a polyline may be more suitable. Additionally, there is the possibility to take positions via offset in situations where coverage is not sufficient at the point where the plant is located. This method utilizes a range pole and laser rangefinder.

Mapping a Direct Position

Using the direct method, the location in which the antenna is located will be the location of the point. If it is not possible to place the antenna in this exact location and maintain accuracy (for example, a tree with a dense canopy), the point will need to be taken by the offset method.

Points

1. Select the "Plant Center" layer and "Point" from the drop-down menu below the point icon.
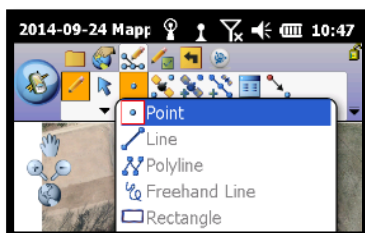
2. Before taking the point, be sure to be in the exact location with the GPS unit of the desired point. Once you are ready select the satellite and two point icon from the toolbar.

3. Now after selecting the icon, a new window will pop up allowing you to add data attached to the recently taken point. Once it reaches 100%, the point will be present in the Plant Center data layer. Select "OK" in the bottom left corner to return to the main map screen. Enter the survey user, survey date, and other relevant data identifying the point (for plants, ideally the Accession Number and Qualifier).

4. If successful, the created point will be visible in the ArcPad map.
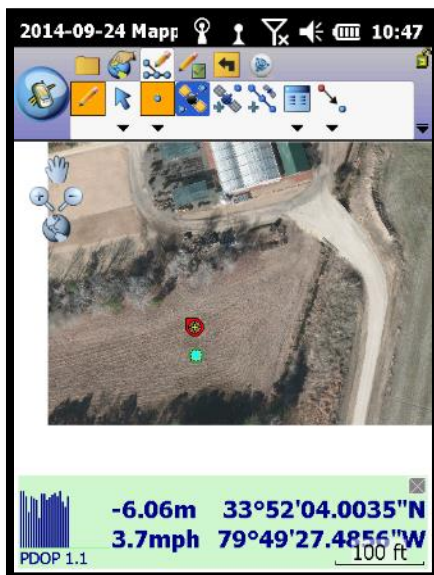
Polyline

1. Select a layer that has the capability to store polyline data. For this example UtilitiesPolyline is selected.


2. Select the Polyline option from the drop-down menu.
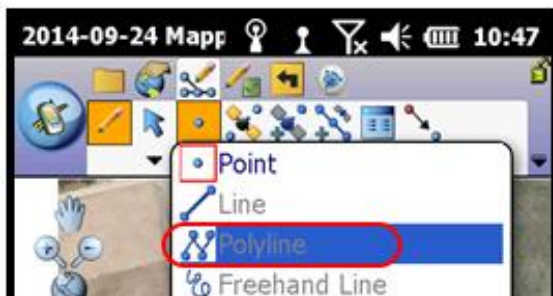
3. Before taking the first point of the polyline, be sure to be in the exact location with the GPS antenna. Once you are ready select the satellite icon with a green 'x' and blue point. This will initiate taking the point where the GPS antenna is located.
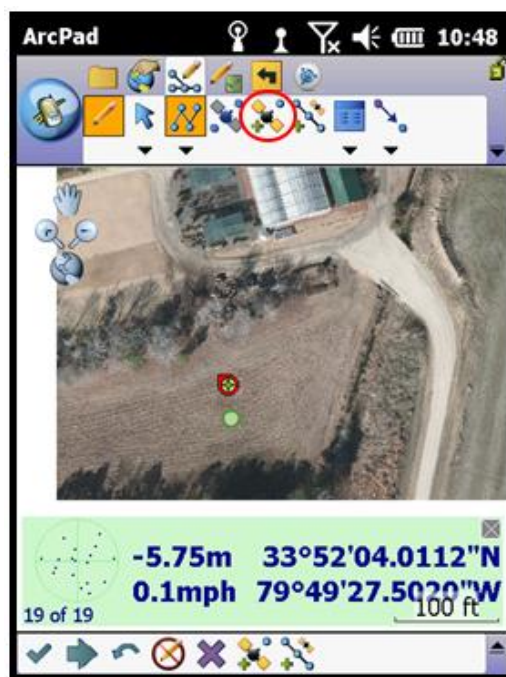
4. Now the GPS will take 10 positions (or however many are set as the number of vertices for averaging in the ArcPad settings) and average them to create one location for the first vertex of the polyline. When 10/10 shows on the screen select "OK".
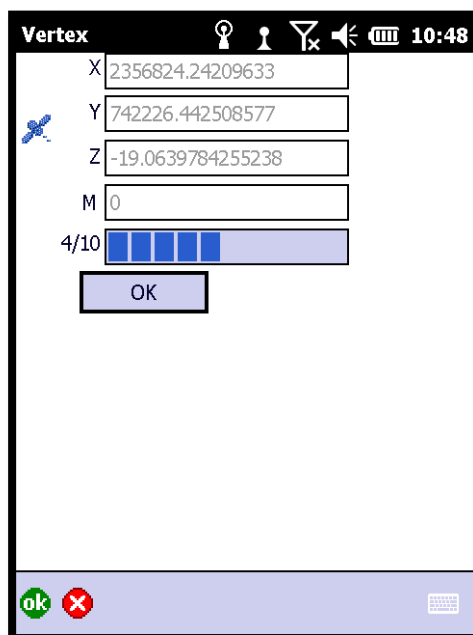
5. Continue creating the polyline by moving to the next point location and selecting the satalite icon with the green 'x' and blue point.
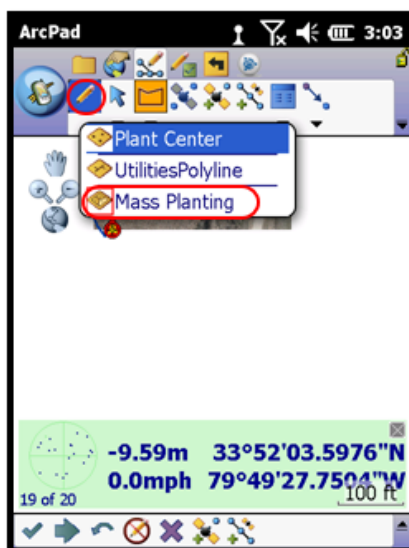

6. Continue to take vertices as needed
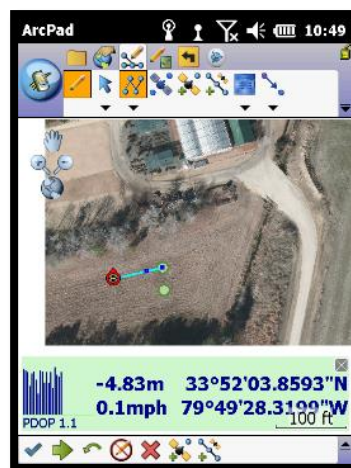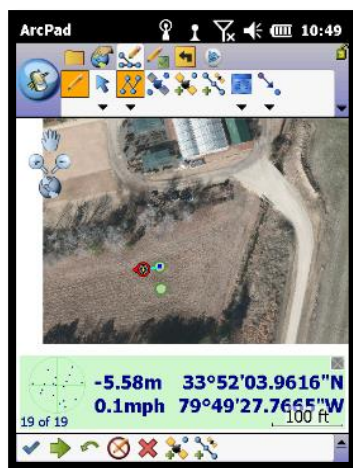
7. When the last point of the polyline is complete select the green arrow at the bottom of the screen to input information about this line.

8. Input information for the polyline. For this example the line type was named "1 demo" for this tutorial. When finished select the green "OK".

9. The completed line should be visible on the ArcPad screen.
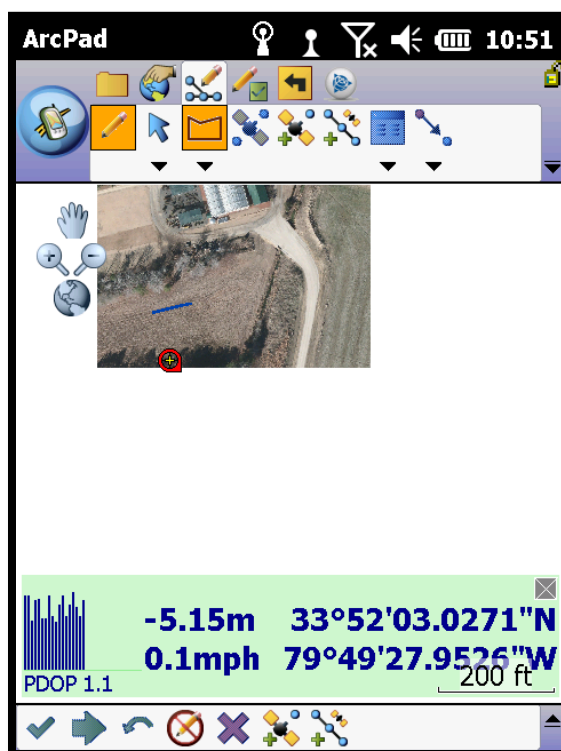
Polygon

1. Select the Mass Planting polygon layer from the Pencil icon. This layer is able to store polygon shaped data.
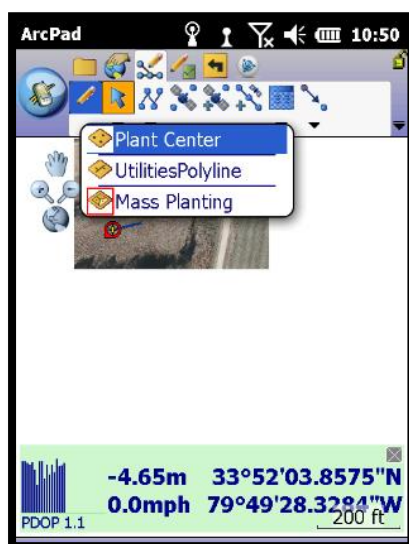
2. Now select the Polygon shape from the drop-down menu. It will show the Polygon shape in the toolbar to confirm that a polygon will be created.
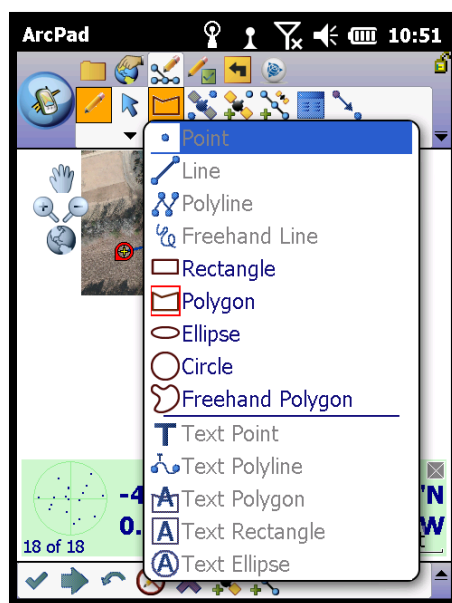
3. The first point of the polygon will be where the antenna is located. To create the point select the satellite with the green 'x' and blue point icon.

4. Now the GPS will take 10 positions to determine the final vertex location. This will take about 10 seconds. When complete press "OK".
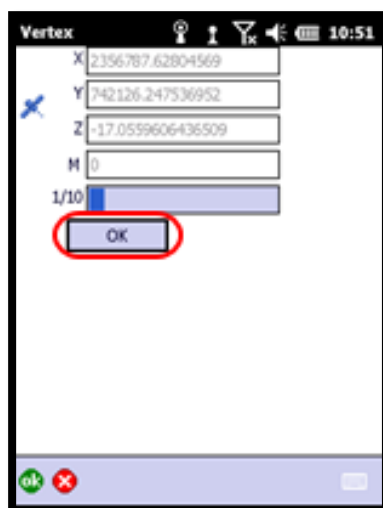
5. The first point of the polygon is now created. To continue this process for other points in a polygon select the green arrow at the bottom of the screen. Continue the same process by moving to the location of the next point and selecting the satellite icon.

6. With all needed vertices taken you are ready to finish the polygon. The last polygon vertex can close itself without another point taken at the starting position (note it will take the most direct route from the final vertex to the starting point). Select the large green arrow at the bottom of the screen.

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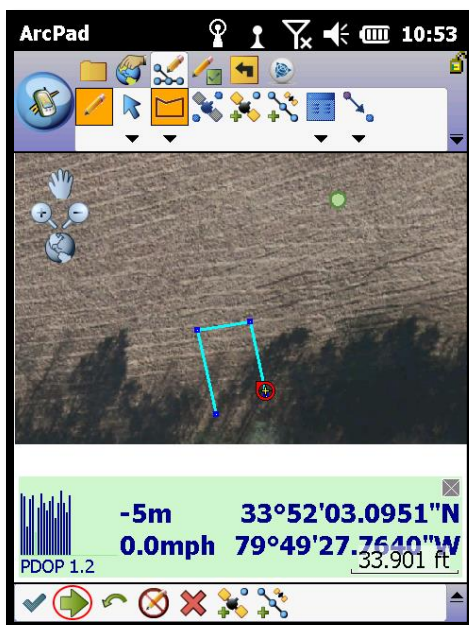
7. Enter important information for the polygon. Pictures and Area/Perimeter information are accessible in the different tabs at the bottom after Pages 1 and 2. (For this example information will be placed in Mass Planting Name, Survey Date, and Survey Name categories on Pages 1 and 2) When complete select the green "OK" at the bottom left of the screen.
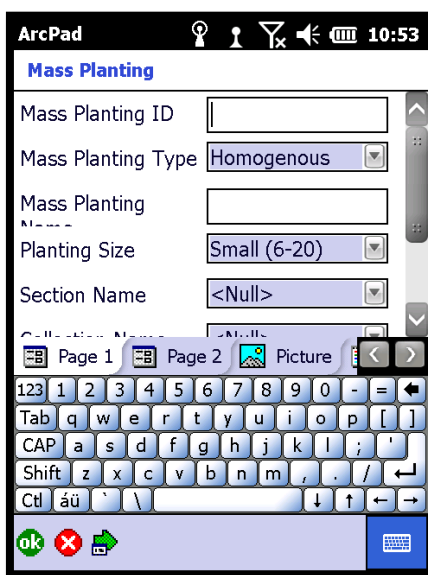
8. The polygon is now complete and visible on the ArcPad screen.
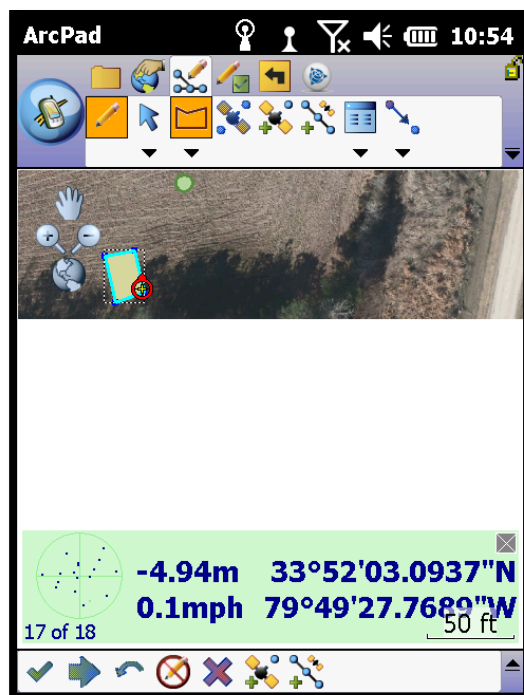
Mapping an Offset Position

Point

1. This method involves using a range pole in addition to the GPS unit. For this procedure, place the GPS Unit in an area where good coverage is available, and then place the range pole in the center of the plant or point to be mapped. When ready to take the point, select the Offset icon from the Editing menu tab without entering the drop-down menu.

2. Open the laser Rangefinder tool by selecting the middle rubber button below the Trimble Geo7x screen. The device's camera will activate and take up the Geo7x screen. Use the crosshairs on the camera to sight the range pole. Once the laser/camera has been successfully aimed, select the middle target icon on the screen. A horizontal distance in feet will be visible. If this seems accurate, press the check mark on the bottom right of the screen.
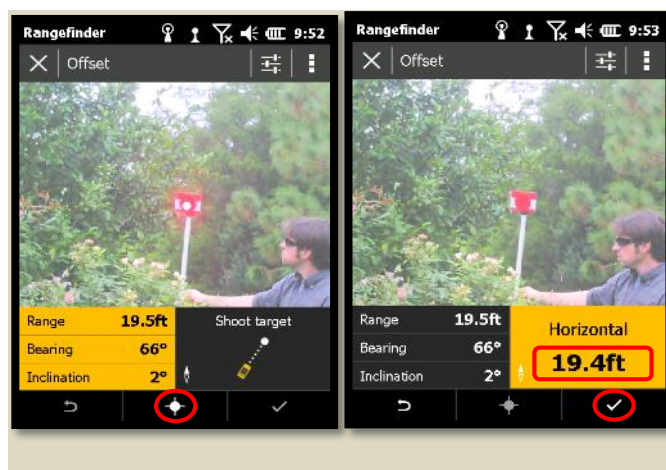
3. In the Point/Vertex window select the tripod image icon to include a reference point. Then in the Vertex window select the satellite image icon to begin the process of creating a point. Once completed select OK.
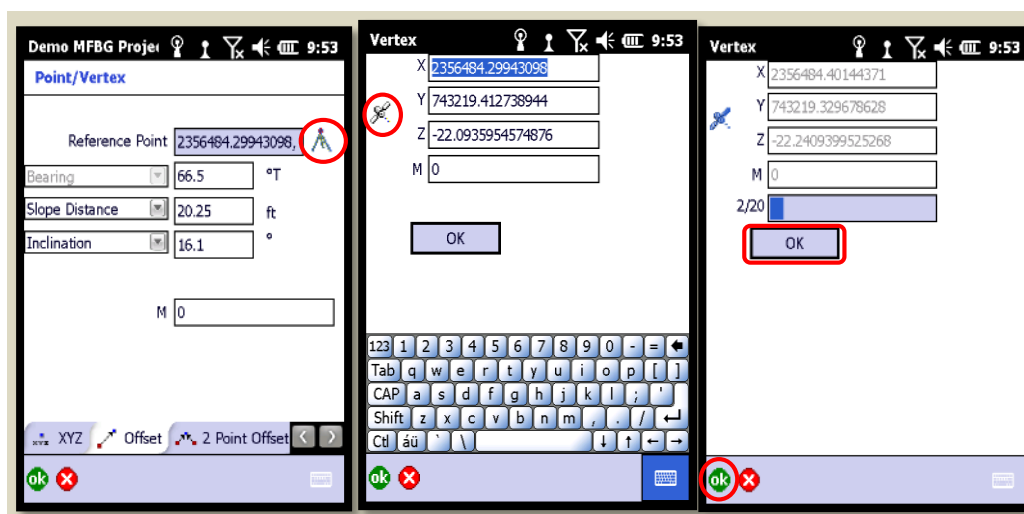
4. Select OK again in the Point/Vertex window of ArcPad
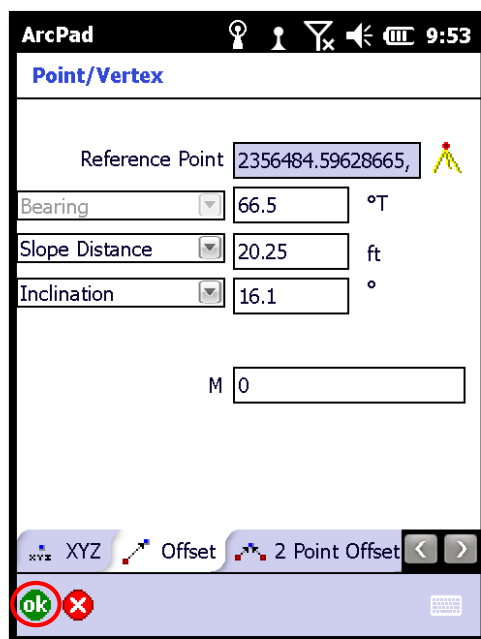
5. Enter the Survey Date, Survey User Name, and any other relevant date identifying the point. When data is inputted and completed select OK.

Polyline

1. Select a layer that has the capability to store polyline data. For this example UtilitiesPolyline is selected.

2. Select the Polyline option from the drop-down menu.

3. Select the icon with the arrow connecting to the blue point. Select "Linear Traverse" from the drop-down menu.
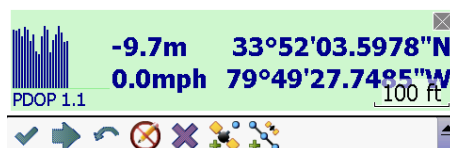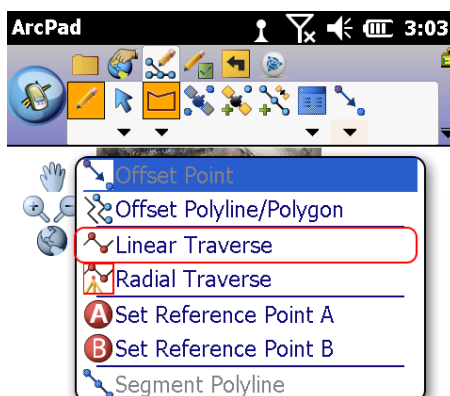
4. Capture the offset point by utilizing the range pole and rangefinder as described on pp. 73-74.
5. Continue creating the polyline by selecting the grey RangeFinder button located in the middle of the GPS device above the green home button and continue previous steps.
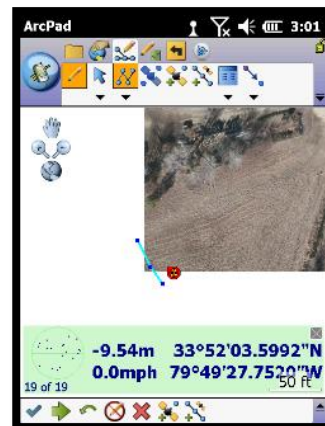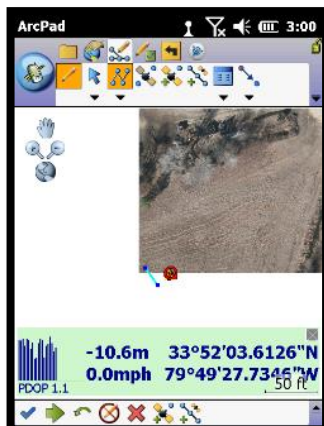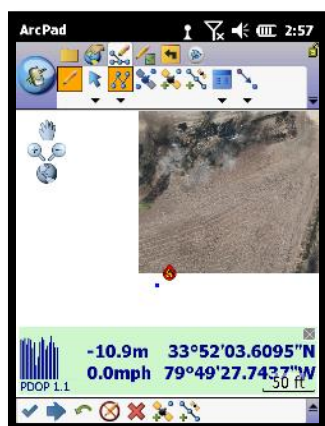
6. When the last point of the polyline is complete select the green arrow at the bottom of the screen to input information about this line.
7. The line should be visible on the ArcPad screen.

Polygon

1. Select a layer that has the capability to store polygon data. For this example Mass Planting is selected under the pencil icon

2. Select the Shape icon and select the Polygon shape from the drop-down menu.

3. Open the offset drop-down menu (icon with the arrow connecting to the blue point). Select "Radial Traverse" from the drop-down menu.
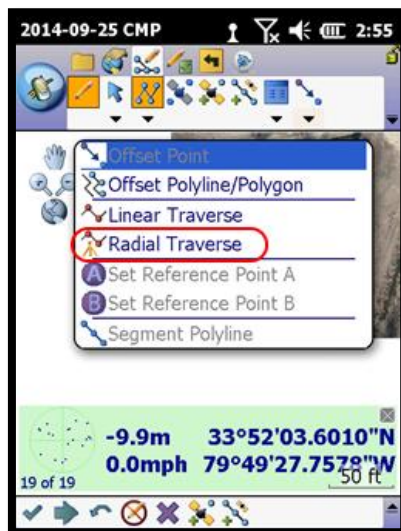
4. Capture the offset point and reference point by utilizing the range pole and rangefinder as described on pp. 73-74.
5. Continue creating the polygon by selecting the grey RangeFinder button located in the middle of the GPS device above the green home button and continue previous steps.
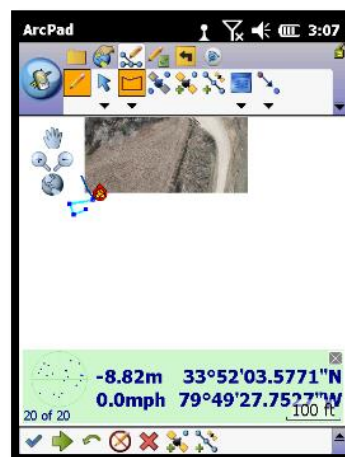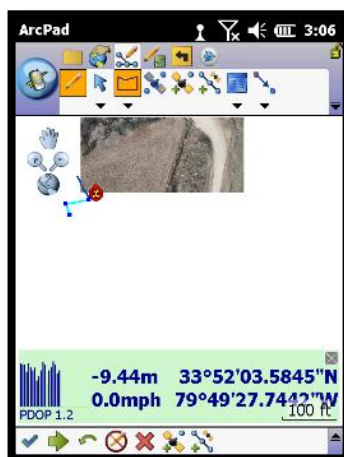
6. When the last point of the polygon is complete select the green arrow at the bottom of the screen to input information about this line.
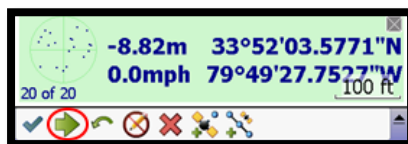
7. After inputting information, the shape should be visible on the ArcPad screen.
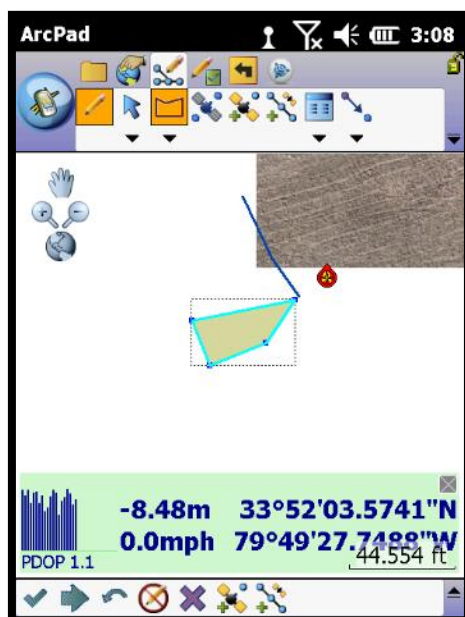
Importing Data from ArcPad (Geo7x) to ArcGIS (PC) and applying Corrections
Note: To avoid duplication of field data, complete the following only once per project, and only when finished collecting all positions for the relevant project.

1. Navigate to the Trimble "MFBG Geo 7X handheld" folder and copy the project from the GPS device to the GIS/GPS folder in Documents. Select OK for all pop-up windows.
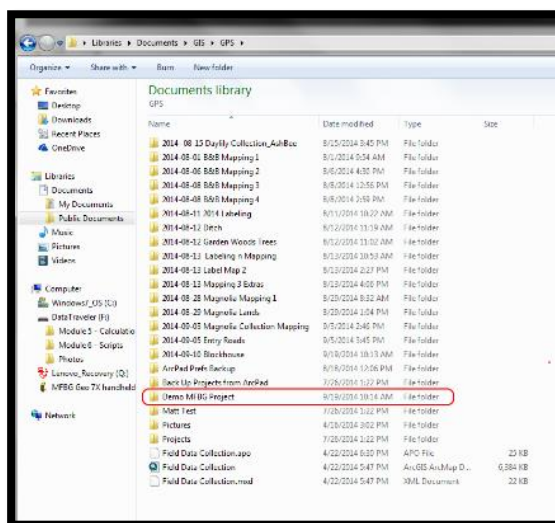
2. Open ArcMap and select the Trimble Positions Desktop icon on the Trimble toolbar
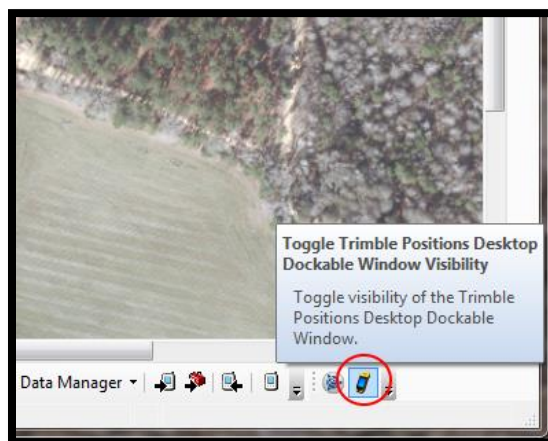
3. Click on "Check Out/In.." button and select Check In From ArcPad from the drop-down menu
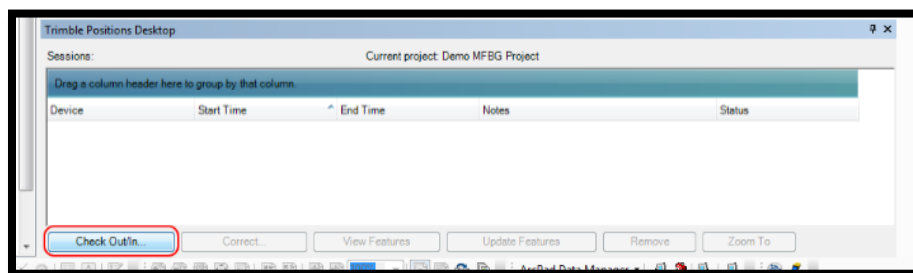
4. Select the "Browse" button and navigate to the project folder. Be sure to move a back a folder or two in the window to ensure the selected data is correct. Open the file.
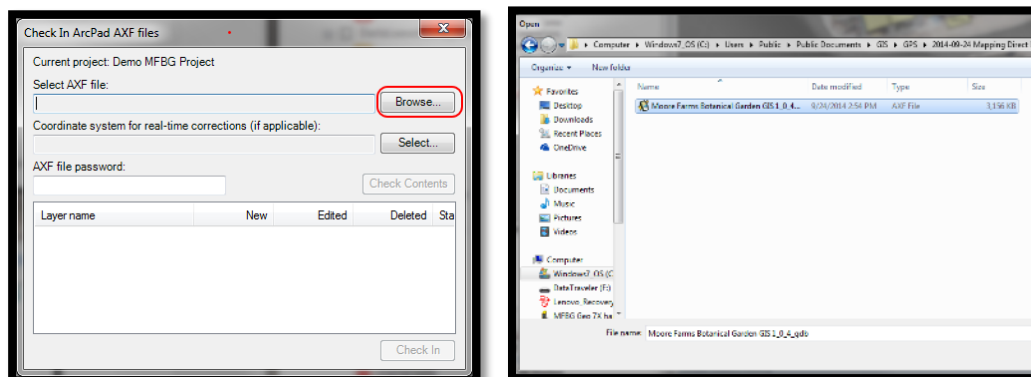
5. Click "Check Contents" to view number of collected features. Finish by clicking "Check In".
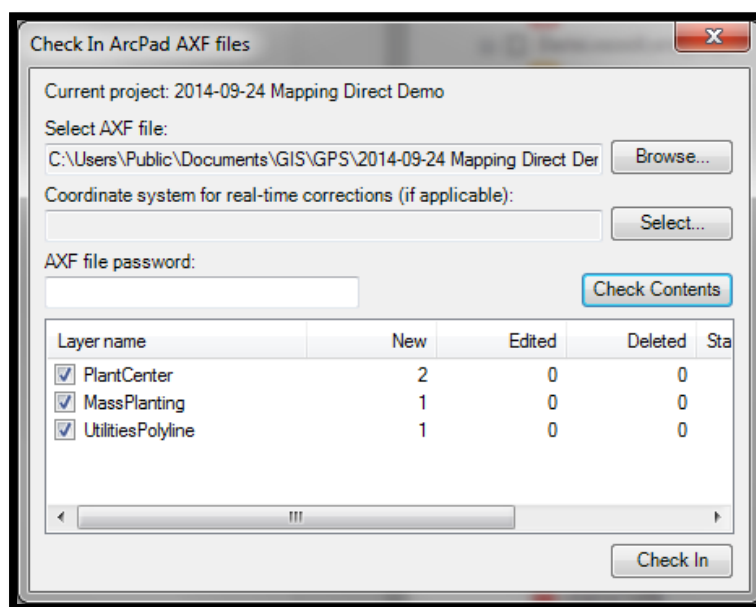
6. This may take a few moments. When complete, click "OK".
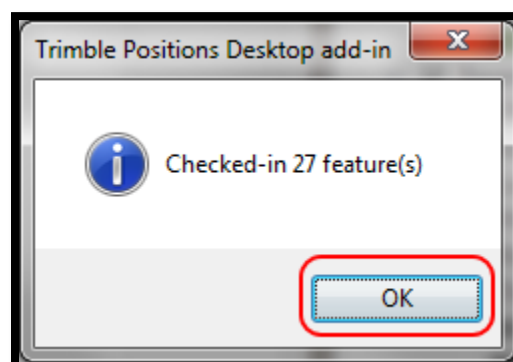
7. Be sure the "Current Project:_____" is the desired project name. If not, please review Step 4 and select the correct folder and data. Next, notice the Status of the data correction under the Status heading. If the Status is "Waiting For Correction" select the Correct button. To select more than one session listed, hold down the Shift key while selecting the other sessions, then select Correct. Otherwise it will only correct the sessions highlighted in blue.
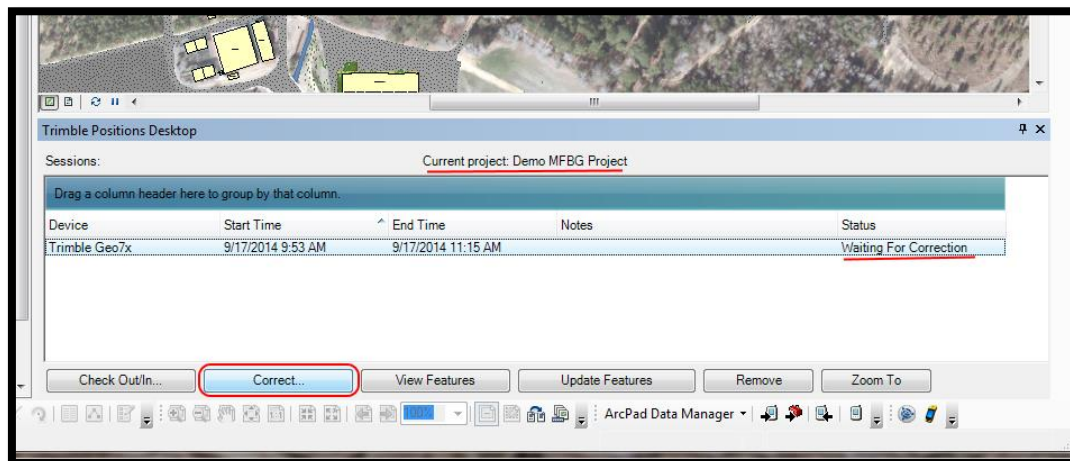
8. In the Correct Sessions window, select one of the "Sessions to Correct:" heading. Once selected press Correct to begin data correction. This process may take anywhere from 5 minutes to several hours.
   NOTE: Fun fact- the closest Cors antenna for data correction is in Lake City at the Fire Station.
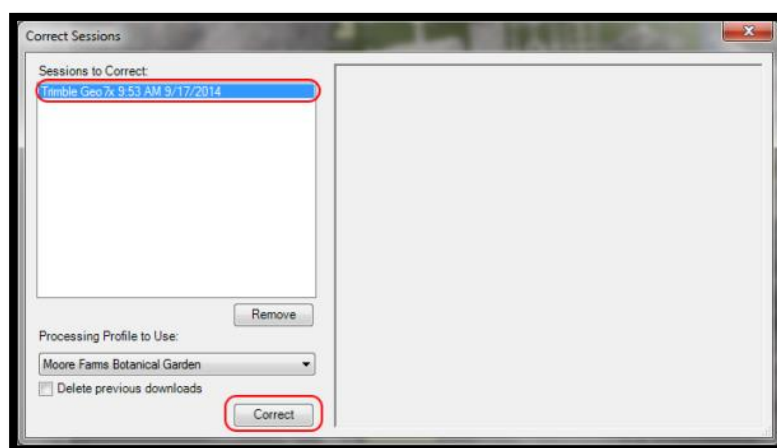
9. When complete, close out of the window. If you wish, you may click the "View Features" button to review each position taken. To apply the corrections to your data, you will need to

10. Verify the points in the attribute table of the Plant Center layer.

11. Remove the Trimble Positions project by highlighting the project name and clicking the remove button.

Entering a Note

To be completed by any staff-person with database access

1. Log into the database with an assigned username and password.
2. Click "View or Edit Plant Accession"
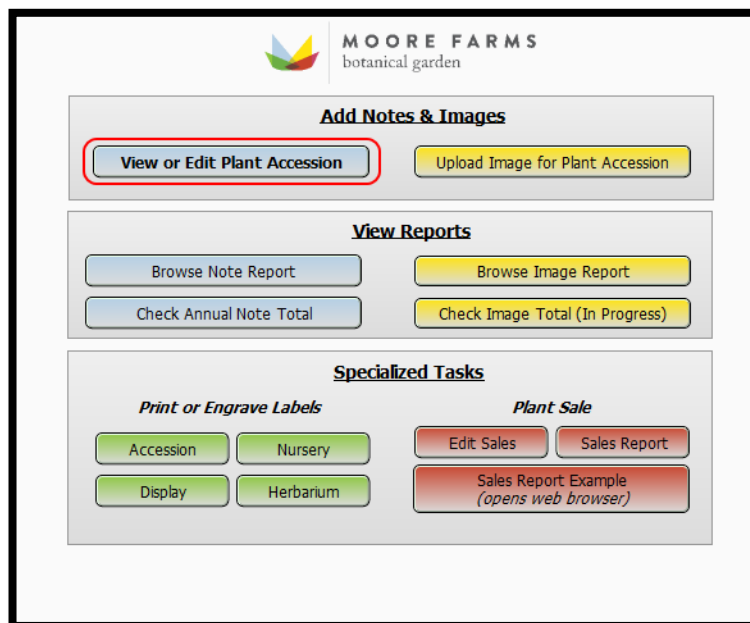
3. Make sure the "Locations and Notes" tab is selected. The space for notes is located on the bottom half of the tab layout.
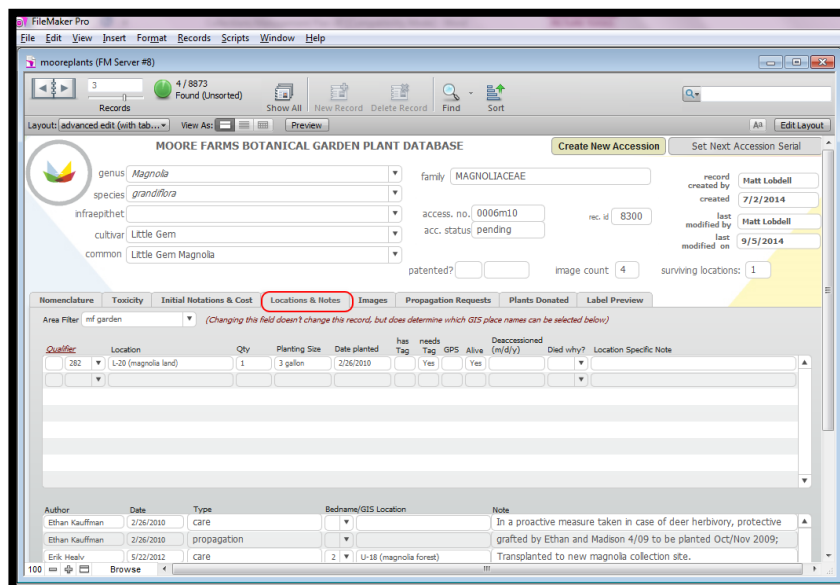
4. Locate the first blank line. In one with several notes, as pictured below, you may need to scroll down through existing notes until you reach the first blank line at the end.

5. Click the blank field under the "type" heading. A dropdown menu will appear.

6. Database notes are defined as belonging to several categories. From the dropdown menu, select the category which best fits the note to be entered.
   a. **Care:** Used to document horticultural tasks completed on an accession (pruning, mulching, fertilization, pest control, etc.)
   b. **Nomenclature:** Used to clarify or note nomenclatural debate or changes for the taxon which the accession represents. Most often used by the Plant Recorder.
   c. **Observation:** For any general note about the horticultural performance of the plant or its current phenology (whether or not the plant is flowering, fruiting, etc.). This will be the most common during the inventory and field checking period.

d. **Propagation:** Used to document dates and procedures for plant propagation. Most often used by Production Coordinator or Grower.

e. **Source:** Used to clarify the source of a plant when not listed from the source dropdown menu while creating a new accession or adding quantities to an existing accession (See Pg. 25).

f. **Comment:** Used to make a general comment about an accession which does not fit into another category.

g. **Question:** Used to ask a question to the Plant Recorder or other staff member. See **Asking a Question** (pp. 86).

h. **Question (closed):** Indicates a question which has been answered. See **Answering a Question** (pp. 86)**.**

i. **Answer:** Used to answer a question. See **Answering a Question** (pp. 86).

j. **Answer (closed):** Indicates an answer which has been seen by the person who asked the initial question. See **Asking a Question** (pp. 86)**.**

7. The date and current user will be added automatically. If these are incorrect, they may be changed by clicking in and modifying the text of the relevant field.

8. By their nature, notes may refer to all plants belonging to a certain accession, all plants in one area belonging to one accession, or just one specific plant comprising this accession. Before

entering the note, it is imperative to indicate which level of organization this note will pertain to. Failure to complete this step introduces a level of confusion and drastically reduces the usefulness of the note.

9. If the note only refers to one specific plant, indicate the qualifier of the plant in the "Qualifier" field. (Note: Only Qualifiers listed for this accession in the upper half of this layout will appear).

10. If then note refers to all plants in an area, click the down arrow in the dropdown box labeled "GIS place name/bedname" and select the proper location. (Note: Only Garden Locations listed for this accession in the upper half of this layout will appear).

11. Finally, enter the note itself in the "note" field. (If the note refers to all plants comrpsiing the accession, clarify as such in the body of the note).

Asking or Answering a Question

It is possible to use database notes to ask a question to the Plant Recorder or other personnel utilizing the database. However, this is not the most efficient way to accomplish this task as the questions must be manually searched for and can go for some time prior to being seen. It is generally recommended to contact the plant recorder directly through email.

Asking a Question

1. Enter a note and select the type as "question". Clarify whether the question refers to a specific qualifier, and entire location, or all plants. See **Entering a Note** (pp. 82)
2. Make sure the note is addressed to a specific person (i.e. enter "Erik: Where was this image taken?)
3. Wait for the question to be answered.
4. Once an "answer" note has been entered and the question is resolved, change the type of the answer note from "answer" to "answer (closed)".

Answering a Question

1. If on a record where a question has been addressed to you, enter a note answering the question and select the type as "answer". See **Entering a Note** (pp. 82)
2. Change the type of the question note from "question" to "question (closed)".

Checking Note Totals
To be completed by any staff-person with database access

1. Horticulturists are required to enter 300 database notes over the course of the year. To check the raw total of notes, select the "Check Annual Note Total" button in the menu menu.
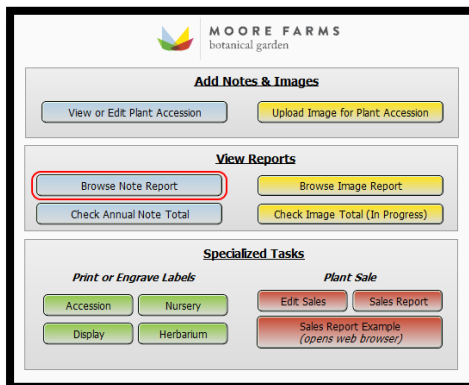
2. A table will appear summarizing the number of notes created by each user in each category.

User_Name	Care	Observation	Prop	Nomenclature	Source	Comment	?'s Active	?'s Closed	?'s Answered	Total Public	Total Private	Total
Erik Healy	306	256	0	4	0	0	0	0	0	562	15	577
Matt Lobdell	14	282	1	161	125	119	136	58		296	604	900
David Poston	170	276	0	3	0	0	1	0	0	446	6	452
Alex Cooley	131	151	0	0	0	1	0	0	0	282	1	283
Katie Dickson	92	151	0	2	0	1	1	1	0	243	5	248
Kirk Laminack	54	39	1	0	0	0	0	0	0	93	1	94
Ethan Kauffman	17	340	2	14	0	6	4	1	0	357	58	415
Madison Turnblad	3	32	2	3	15	0	0	0	0	35	33	68
Leanne Kenealy	0	4	5	0	0	0	0	0	0	4	5	9

3. In some cases, it may be more desirable to search for specific notes in order to determine how many were completed in a specific time frame. In this case, the "Browse Note Report" button on the main menu.

WORKING DRAFT: 10/2/2014: Complete save for Herbarium procedures
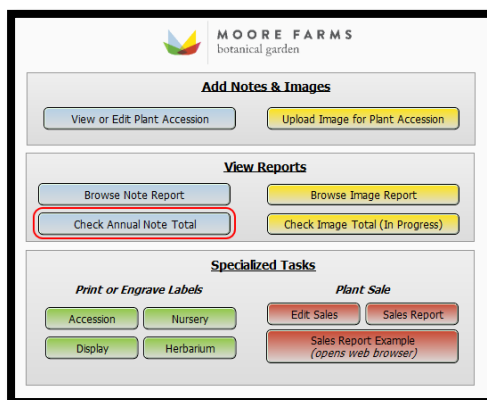
4. Using this layout, it is possible to complete detailed searches of all notes to perform those tasks.

Adding an Image

To be completed by any staff-person with database access

1. Prior to uploading an image, reduce it to a maximum file size of 500 kb (See **Appendix II** for a procedure on how to do this).
2. Log into the Database with an assigned User Name and Password. See **Logging in to the Database** (pp. 15)**.**
3. Click the "Upload Images for Plant Accessions" button
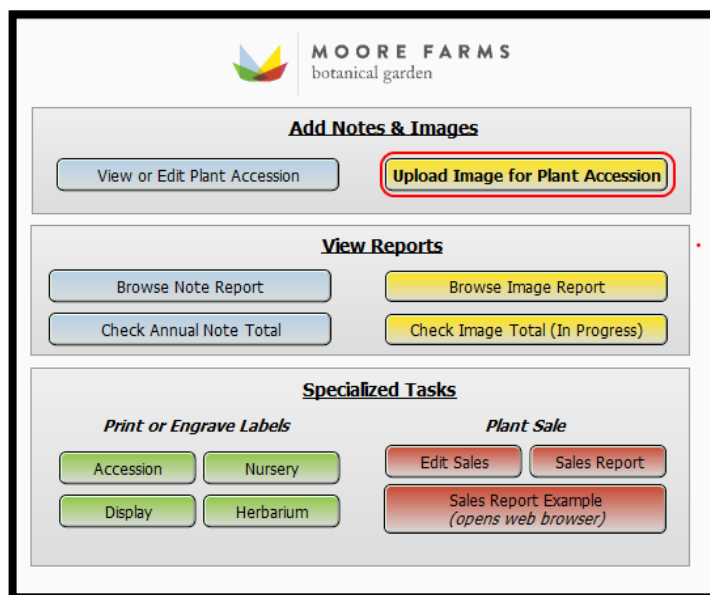
4. Search for the accession captured in the photograph. See **Searching for a Plant** (pp. 16).
5. Next, locate the container field. It's the large blank rectangle underneath the "Image Preview" heading. Right click then select "Insert Picture..." from the side menu or drag and drop the image into the container field.
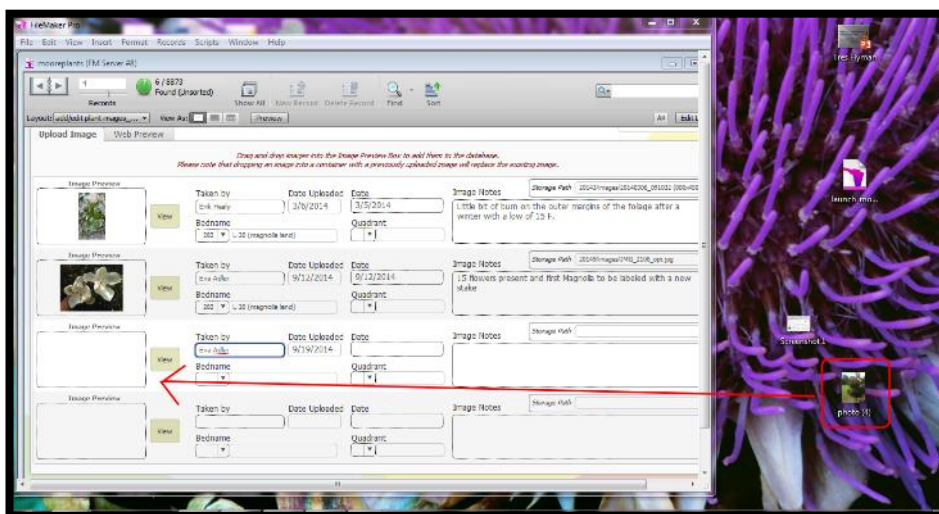
6. If the image is too large, you will receive the following error message.
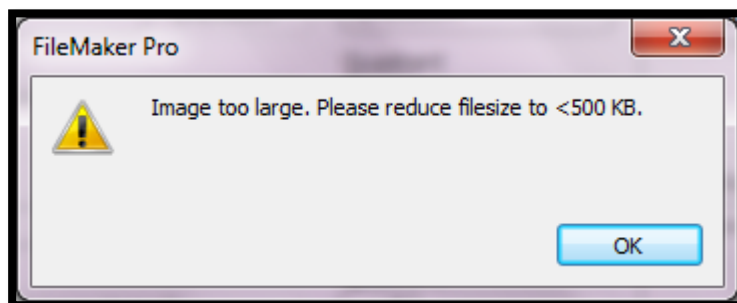
7. The container field will change to display the image, and the "photog." field will automatically update to display the current user's name. Click in the "bed field". A down arrow will appear. Click the down arrow to bring up a drop-down menu. Select the garden location where the plant is located (Note: Only locations where the plant is currently indicated as being located will appear).

8. If necessary, specify the quadrant where the plant is located. At time of writing, this is only used for plants on the Green Roof.

9. Enter the date when the photograph was taken in the "date taken" field.

10. Finally, enter any relevant information about the photograph in the "photo note" field. The process is now complete and the image will be made available on the website following the next synchronization.

WORKING DRAFT: 10/2/2014: Complete save for Herbarium procedures

Recording Death or Removal of a Plant

To be completed by Plant Recorder, or Horticulture Supervisor, Research Horticulturist, Horticulturist, or any other staff-person responsible for maintenance of a garden area

1. Log into the Database with an assigned username and password (See **Logging in to the Database** pp. 15).
2. Push the "View or Edit Accession" button. Search for the accession from which propagules are to be requested (See **Searching for a Plant** pp. 16).
3. Select the "Locations & Notes" tab
4. Under the "Qualifier" heading, locate the row corresponding to the plant which has died or been deaccessioned.

5. Enter the date the plant died or was deaccessioned in the "Deaccessioned m/d/y" field.

6. Click the down arrow in the field labeled "Died why?" Select the cause of death which most closely explains why the plant died or was removed. If you have any additional information to contribute, enter a separate database note. See **Entering a Note** (pp. 82).

Printing an Inventory List

To be completed by Plant Recorder, or Horticulture Supervisor, Research Horticulturist, Horticulturist, or any other staff-person responsible for maintenance of a garden area

1. From the main menu, click the "Print Inventory List" button
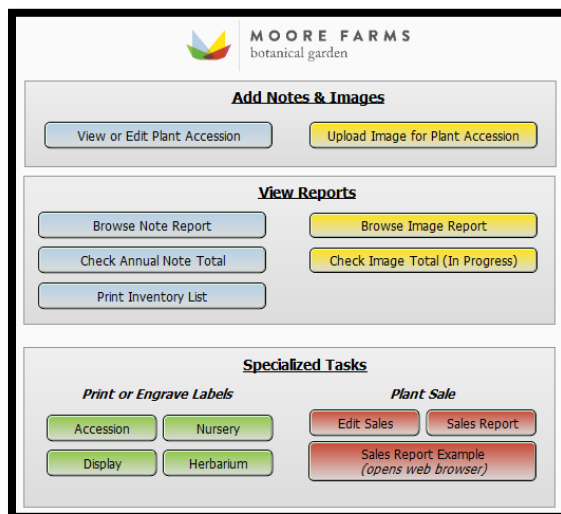
2. Use the Find function to perform a find for the garden area of question. *Hint: Also search for alive = "yes" if you only want living plants on the inventory.*
3. The inventory checklist will be generated. Click the "preview button".

4. You may either print, save as excel, or saveas a PDF.

Requesting Propagation

To be completed by anyone requesting a plant propagated at the Production Center.

1. Log into the Database with an assigned username and password (See **Logging in to the Database** pp. 15).
2. Push the "View or Edit Accession" button. Search for the accession from which propagules are to be requested (See **Searching for a Plant** pp. 16).
3. Switch to the "Propagation Requests" Tab

4. Create a new request by clicking the down beneath the "Req. By" heading. A Drop-down menu will appear. Select your initials (or the initials of the person making the request).

5. The word "pending" will appear under the "Req. Stat." heading. A calendar will appear. Click the date the request was made (by default, today's date will be selected). The date will appear under the "Req. Date" heading.

6. Click in the field under the "Need by Date" heading. Another calendar will appear. Select the date when the plants will be needed. Use the left and right arrows at the top of the calendar to change month.

7. Specify the location of the plant from where you would like the propagules collected. Push the inverted triangle to access the dropdown list of bed locations.

8. Enter the quantity of plants needed under the "Qty req" heading.

9. Click in the field under the "Size Needed" heading. From the dropdown menu, select the requested size of the plants.

10. If the specific type of propagule requested is known (cutting, seed, division, etc.), select it from the dropdown "Pr. Type" field.

11. Enter the garden location in which the requested plants are intended to be located. Use the dropdown for "Prop. Use Farm" if located on Moore Farms Botanical Garden property, "Prop. Use DM" if located on Darla Moore property, or "Prop. Use LC" if for Lake City Landscapes. Reference the map (Appendix V) for delineations of the two zones. Plants requested for sale should be indicated as such in the "Prop. Sale Use" field. Note in the comment field which sale these plants are intended for (Plant Sale, Farmers Market, etc.).

12. Ignore the remaining two fields (Pr. By, Hormone) as they will be completed by the Production Coordinator during the propagation process. Click the email button at the end of the line to forward the request to the Production Coordinator.

Produce a Herbarium Specimen

To be completed by any interested staff-person

(Procedure to Follow)

Print a Herbarium Label

To be completed by Plant Recorder

(Procedure to Follow)

Appendix I: Garden Areas of Responsibility

David

- **Front Meadow** M-03
- **Sevens/South Lawn** J-08, J-07, H-07, F-07, F-09, G-09 (north end), H-09 (north end)
- **West Pecan Grove** D-03
- **Swimming Pond** Y-10, Y-14, Y-15
- **Formal Garden** M-07, M-08, M-09, N-07, N-08, K-09
- **Truck Border** T-10
- **Security Office** X-01
- **Crepe Myrtle Lane**
- **Kennel** C-15, C-11
- **Intern House** A-01
- **Morris St. Planting Beds**

Katie

- **Main House and environs (including Mailbox Beds)** J-04, I-04, I-03, G-04, J-04, G-02, G-03, H-02, J-02, K-02
- **Cut Flower** N-10
- **Fishing Pond** O-13/O-14
- **Pond Boardwalk** M-10, L-12
- **FT Gardens** V-15, U-08, V-10, V-11, V-12, U-09
- **Lake City**
- **Honey Bees**
- **Christmas Tree Plot**

Leanne

- **Production Center** X-00

Kirk

- **Green Roof** J-20
- **Living wall** J-21
- **Trial Garden** C-22

Alex

- **Pine Allee** H-01
- **Rose Field** V-01
- **Goat Pen** B-01
- **Peach Meadow** O-12
- **East Pecan Grove** Y-01
- **Muscadine Vineyard** B-20
- **Crepe Myrtle Allee** M-04
- **Maintenance facility** J-19, E-20, E-22
- **FT Gardens** V-15, U-08, V-10, V-11, V-12, U-09
- **GR Woods** J-18

- **Burn Pile**
- **Mrs. Lorraines**
- **Morris St. Turf**

<u>Erik</u>

- **Vegetable Garden** O-08
- **Turf**
- **Orchard** K-08 FG
- **Tropical Border and environs** E-15, E-12, E-11, E-10, F-11
- **Pack House** H-11, H-10, H-09 (south end), G-09 (south end)
- **Garden Pond** J-09, J-10, J-12, J-13, J-15, L-12, L-15, M-14, M-15, I-10
- **Magnolia Land** L-20 and 378 (to be given bed number
- **Formal Garden** M-07, M-08, M-09, N-07, N-08, K-09
- **Entry Roads, Mounds, and Stumpery** F-98, F-99, E-98, E-99, E-20, E-25, E-30, E-50. E-51, J-25
- **Truck Border** T-09
- **Christmas Tree Plot**

<u>Ethan</u>

- **Pine Bay** R-01, R-07, T-01, T-02, T-08, S-01, S-02, S-03, S-09
- **Bog Garden** V-13

Appendix II: Editing Images in Picasa

Picasa is a free image editing software produced by Google. It provides numerous tools for resizing, editing, and organizing images. Below is a procedure to utilize Picasa to edit an image in preparation to upload to the Moore Farms Botanical Garden Plant Database.

1.   Download Picasa from http://picasa.google.com. Google will automatically detect the proper version for your operating system.
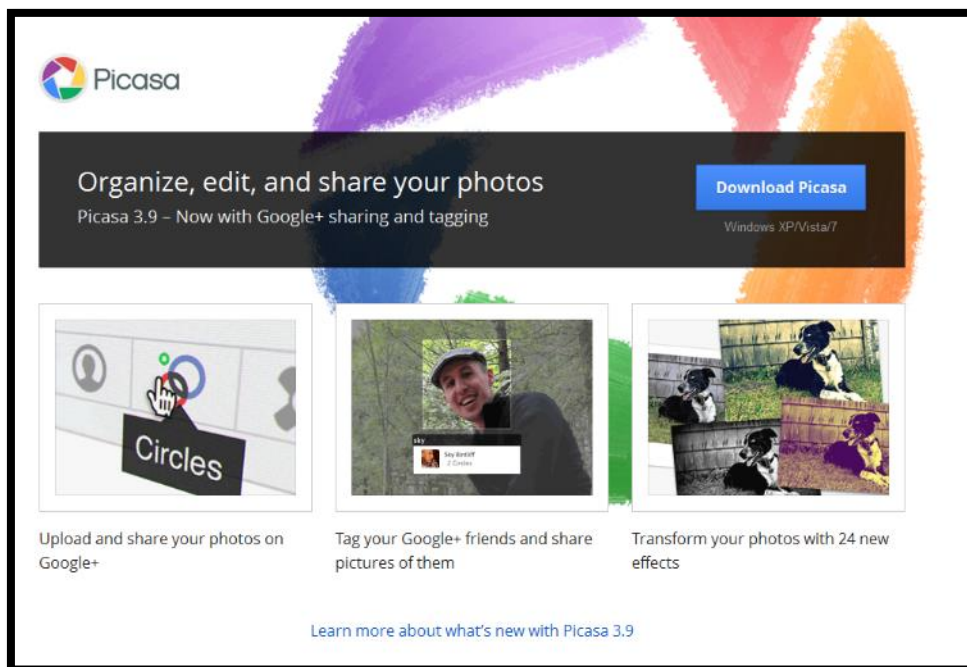
2.   Run the Installer, agree to the license agreement, and install the program on your machine.
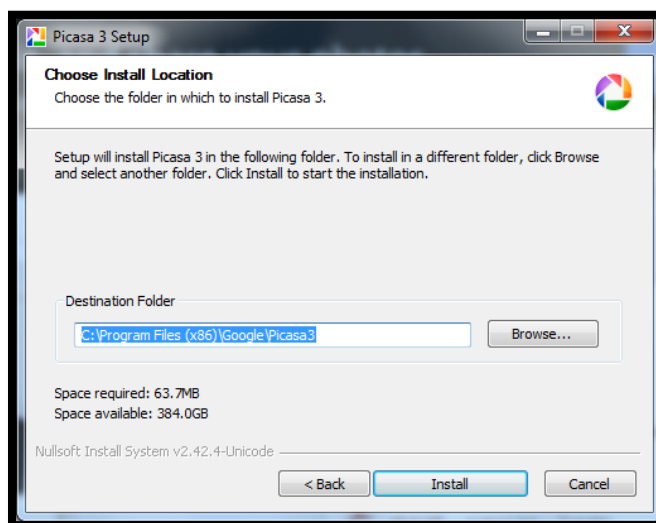
3.   Open and Run Picasa. Picasa will automatically search the hard drive for any images.

4. Picasa will list any folders containing images in the left frame, and allow you to browse the images themselves in the right frame. If the images you wish to upload are already on your machine, skip to step 9. Otherwise, proceed to step 5 below to import them from a camera or SD card.
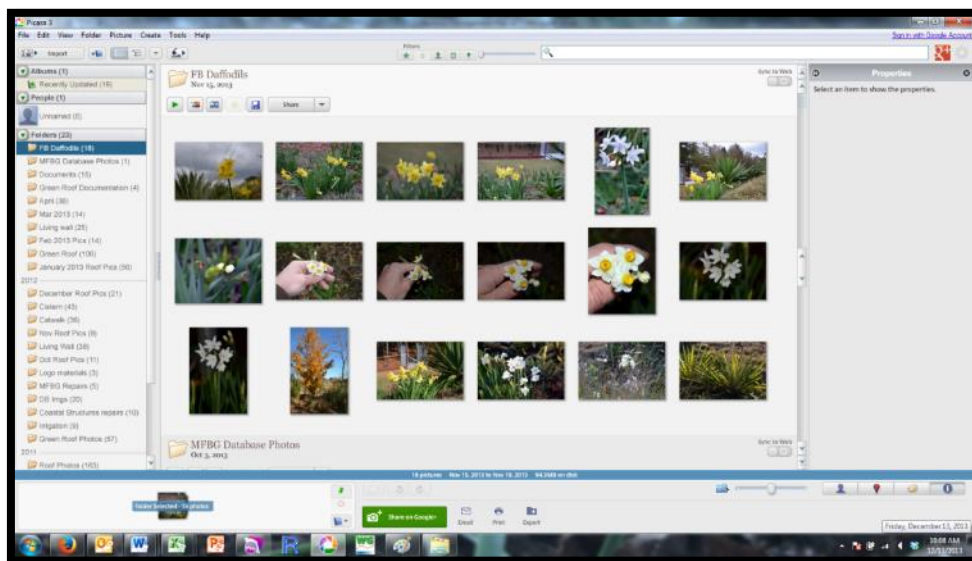
5. Click the "Import" Button on the top, left hand side of the screen
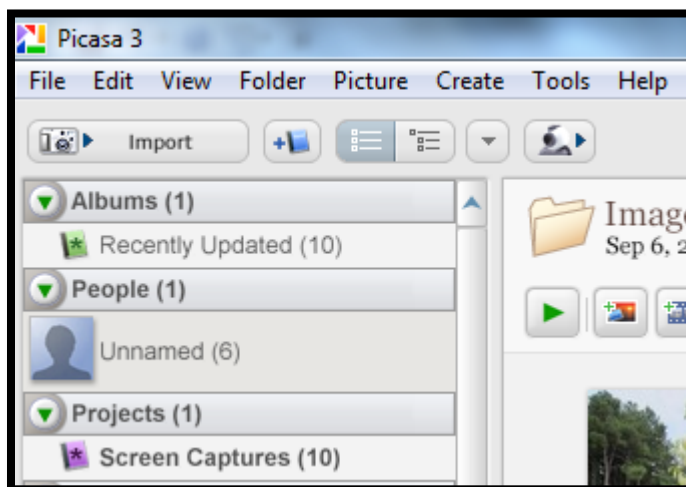
6. On the dropdown menu on the top of the import tab, select the device from which you wish to import images (on this specific machine, the SD Reader uses drive letter E)
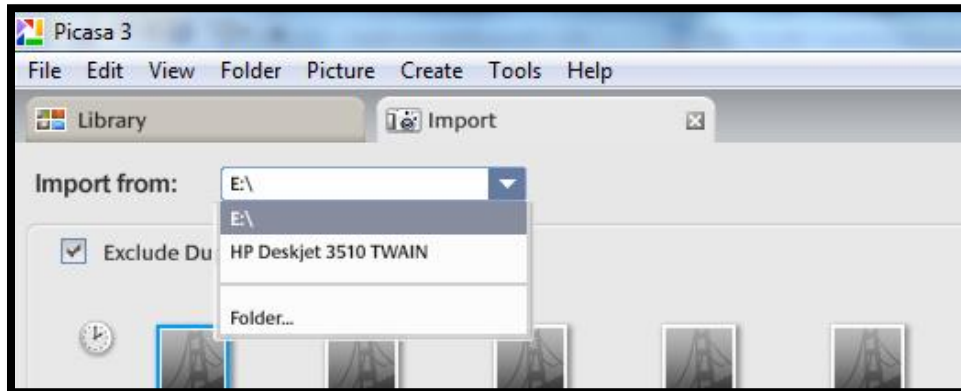
7. Select the image you wish to export from the camera. Multiple images may be selected by clicking while holding the control button.
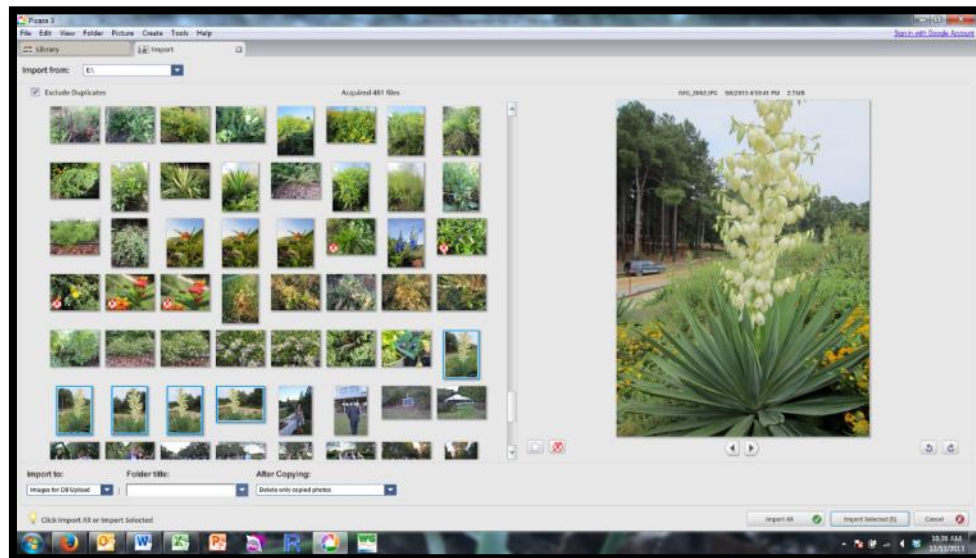
8. Select the location to where you wish to export the files. I've created a folder on my desktop called "Images for DB Upload" for this purpose. At this time, you may choose whether you wish to delete the images from the SD card after exporting them. After making your selection, click the "Import Selected" button (or "Import All" if you wish to import all images on the SD Card).
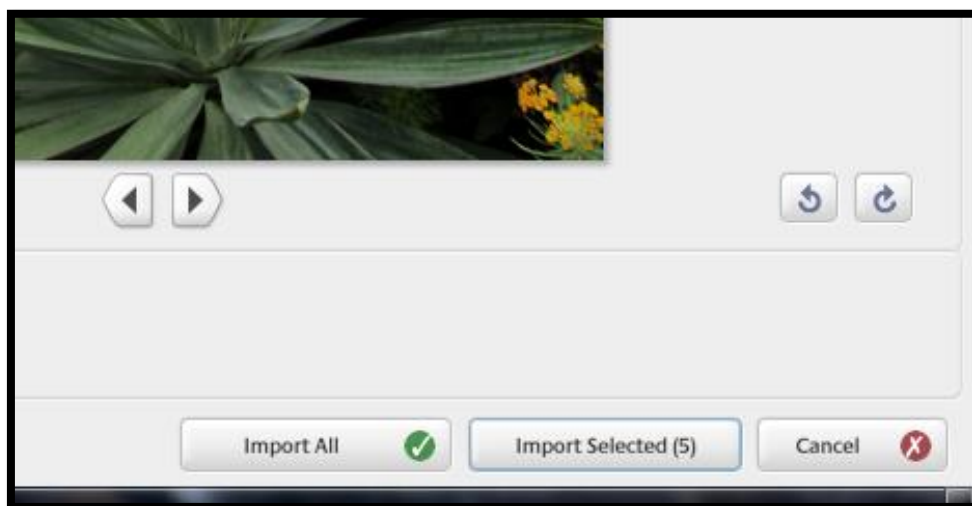
9. The selected images have now been moved to the "Images for DB Upload" folder. Select the image you wish to prepare for upload.
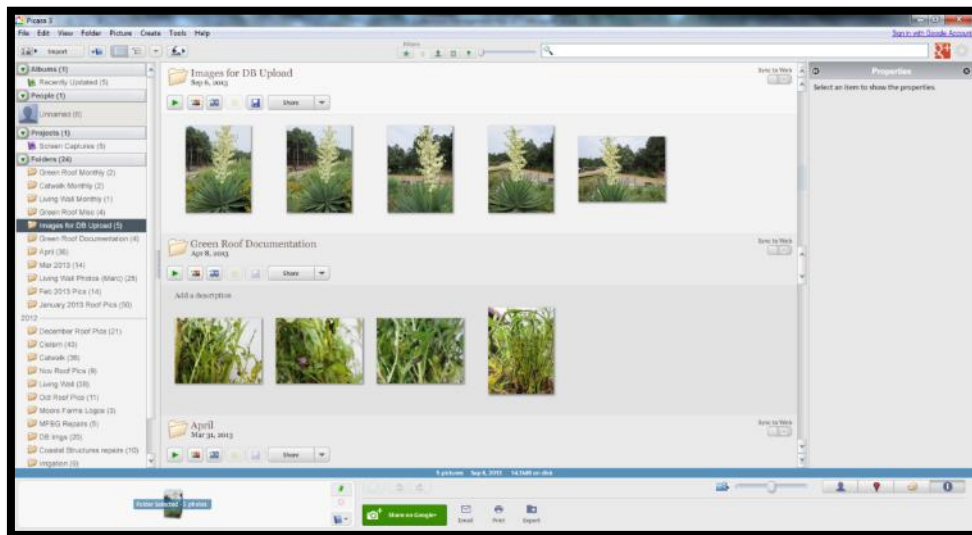
10. Numerous tools are provided to adjust the brightness and contrast of the photo, as well as other visual effects.
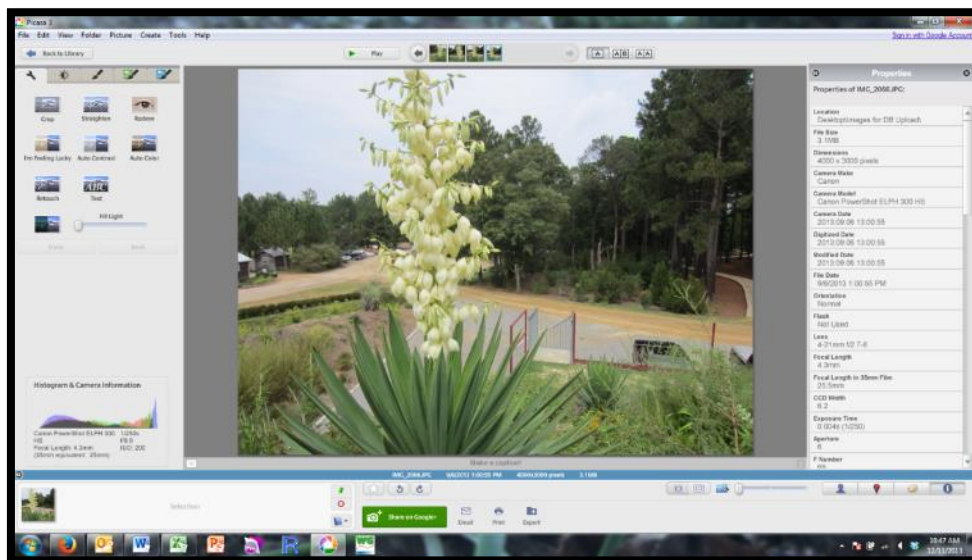
11. Once the image has been adjusted to your liking, select "Export Picture to Folder" from the File Menu.
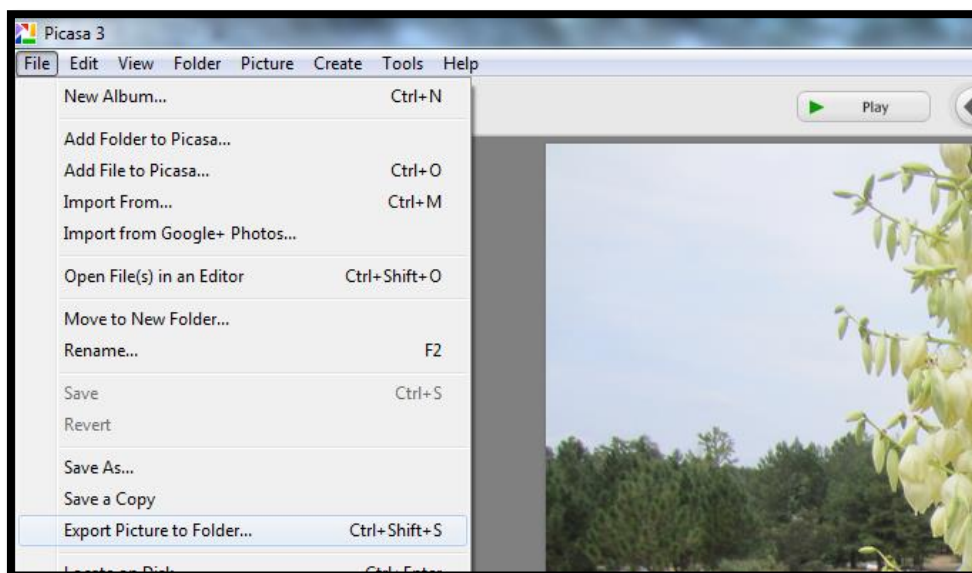
12. The following dialog box will appear. By default, Picasa will export to its "Exports" folder, and will create a subfolder within matching the name of the folder where the image is currently located. The most important step here is to resize the image in order to keep the file size under 500 kb. The default will resize to 1024 pixels, which is sufficient for our purposes. Click Export, taking note of the location where the file will be created.
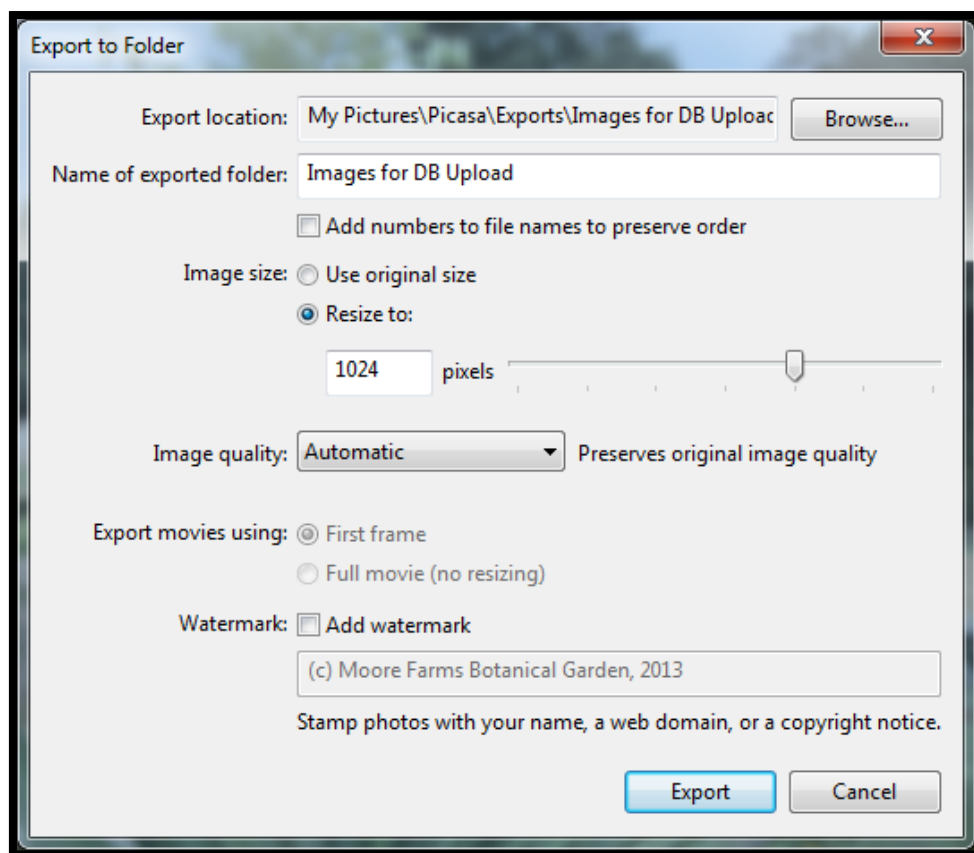
13. Navigate to the location where the file was created. The image is ready for upload to the database.

Appendix III: Accessing the Database through FileMaker Go

FileMaker Go is a mobile app designed to allow the editing and updating of FileMaker databases from mobile devices. As of FileMaker Go 13, full editing capabilities of existing records are supported, though creation of new records is not. In other words, though accessions can be updated and edited from a mobile device, new accessions must still be added from a workstation. At time of writing, FileMaker Go is only available for iOS. Android, Windows Mobile, and Blackberry devices are not supported.

1. Download FileMaker Go 13 from the App Store.
2. Open the App. The following screen will appear. Press the "Hosts" Button in the lower right.
3. Press "Add Host".
4. Under "Host Address", enter (without quotation marks) "fmnet:/fms8.longtermsolutions.com/". Enter a Host name if you wish. Push Save.
5. Push "Enter Filename".
6. "Network File Path" should consist of the host name entered in Step 4. After the forward slash, enter (without quotations marks) "mooreplants.fmp12". Press "Open" or "Done"
7. An error will appear stating "The Field is not modifiable". This is due to the fact that FileMaker Go has circumvented the usual database login screen, so is currently logged in under the guest/read-only account. To gain general access privileges, press the "MOBILE Login" button on the top right of the screen.
8. Log in with your assigned username and password.
9. You may be redirected to the Mobile Layout. If not it can be accessed from the main screen by the "MOBILE Menu" button. From here you may access three layouts: PLANT NOTES, PLANT LOCATIONS, and PLANT IMAGES. As you may be able to guess, PLANT NOTES is best for entering observation notes, PLANT IMAGES allows you to upload an image (and can even directly use the iPhone camera to take an image). PLANT LOCATIONS provides more location-specific fields, which may be useful in some cases where you wish to enter a note but are not necessarily aware of the accession number.

Appendix IV: Database Privilege Sets

The below summarizes current levels of database access based on job title.

[Full Access]: No restrictions

- **Plant Recorder**
- **Contracted Database Consultants**

Plant Records Intern: This set allows for full usage of the database including the ability to create layouts, though withholds the ability to delete records from the plants table as well as the ability to modify database architecture (no creation of fields or relationships)

- **GIS Intern** or equivalent

Create with Full Edit: This set allows for the ability to create any records in the plants table as needed, though doesn't provide access to any of the development tools.

- **Garden Director**
- **Operations Manager**

Create with Partial Edit of Accessions: This set is similar to the above though blocks access to some of the nomenclature tables (Family lists, etc.) and blocks the ability to change accession numbers and approve or reject accessions.

- **Horticulture Supervisor**
- **Production Coordinator**

Partial Edit of Accessions (Can't Create): Does not allow for the creation of new plant records, though existing records can be edited. Notes and location level information can still be created

- **Research Horticulturist**
- **Horticulturist**
- **Education and Events Coordinator**

Intern Privilege Set: Can edit existing records in Plants table and has minimal access to other tables.

- **Horticulture Intern**
- **Education Intern**

Appendix V: Map of Property Delineations