

What Time Is it: Propagation Scheduling at Bracy's Nursery[®]

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At Bracy's Nursery we grow over 650 different taxa of ornamental and fruit bearing plants. Bracy's utilizes 1.4 million liners to produce these taxa. Of these 1.4 million liners, Bracy's produces approximately one million liners in house.

Bracy's has two primary propagation structures that have a combined total of 2601 m² (28,000 ft²) of area. Due to the area limitation and the fact that the structures are not heated for winter propagation, scheduling becomes crucial.

BEGINNING PROPAGATION SCHEDULING

To begin propagation scheduling for a given year we compile a preliminary list of information:

- 1) Liners needed by type/group and size.
- 2) Time when liners are to be utilized.
- 3) The optimal time to root said liners.
- 4) The time range when liners can be rooted.
- 5) The cumulative time needed to acquire, prepare stick and finish the rooting process for each type/group.
- 6) Total area of propagation space available.
- 7) Man hours available to complete propagation.

CALCULATING OUR MACRO DATA

With this list we move forward with calculating our macro data.

- A. Plant/Group: (1) date liners needed, (2) cumulative time to propagate, and (3) determining how far in advance to schedule propagation.
- B. Plant/Group: number units needed + liner size = Total area needed to propagate.
- C. We now add up the total time needed to produce all liners required and the total area needed to produce all liners required. From this we calculate "C".
- D. Total time needed × total area needed = Space time needs (STN).
- E. We now take the total man/h available and the total space available to calculate "D".
- F. Total space available times total man/hrs available = Space time available (STA).

MAKING PROPAGATION DECISIONS WITH THE STN/STA RATIO

Using the ratio STN/STA ratio we can make managerial decisions. If the STN/STA ratio is less than or equal to 1, then our scheduling will be less complicated and critical. However, if the STN/STA is greater than 1, then scheduling becomes critical. At Bracy's the STN/STA ratio is typically 2 to 2.5.

At this point, we begin selecting high priority items from our liner needs. This high priority list is comprised of items that are difficult to root, are in large quantities that require significant man/hrs to produce or have a very narrow time period in which to propagate. Some examples include:

- Junipers: Late January and early February — time specific
- Crepe myrtles: June — large quantity and time specific
- Blueberries: July — time specific
- Dwarf yaupon: September — difficult to root

Once time slots are assigned to the high priority items, we begin filling in the schedule by grouping items by their optimal time to propagate. During this stage, we section off groups of plants in smaller time periods, typically 1 to 2 months. For each of these time periods we recalculate the STN/STA ratio. In these smaller time periods, the ratio must be 1 or less, or something will not finish propagation in order to open needed space for the next grouping period. If the ratio is greater than 1, then moving items around the schedule

will be necessary. In working the schedule, we try to place items as early as possible within their optimal rooting period. This allows more flexibility later in the propagation year for adjustments.

After the overall schedule is laid out the real work begins. The original estimates for completing the propagation for a given item or group rarely fall in line with what actually occurs. Constant monitoring of the propagation process is necessary to evaluate where we stand in regards to the original schedule. A crop failure, problems with the availability of cuttings and weather conditions all contribute to the schedule being off. New items being added to the needs list also creates the need to make adjustments. These occurrences make it necessary to reevaluate and rework the schedule. When reworking the schedule, we once again use our STN/STA ratio to ensure that we can complete the revised schedule. This is where early scheduling of items helps with our rescheduling by opening up available space for later items.

As we move through the propagation year, items that have completed the process are moved out from the propagation structures. This available space is then added into our STN/STA ratio for the next work period. If the propagation schedule is on track, the STN/STA ratio for the overall schedule should drop below 1 towards the end of the propagation year. If the ratio does not fall below 1, then a decision is made as to what remaining items to propagate have a high priority and which ones may need to be brought in as liners.