Decisions a Grower Makes Concerning Propagation

- Purchase liners from specialists who efficiently propagate species on a large scale or employ a staff propagator.
- It is a matter of economics vs. quality.
- Materials, labor and space must be considered.
- Do you have the time?

Advantages and disadvantages of buying from a specialist

- Grower does not have direct control
- Quality may not be as high as desired
- Product may not be delivered safely
- Product may not be delivered on time
- Cultivar may not be available due to quantities and season of the year

Seed Production and Marketing

The goal of plant propagation is to reproduce a plant with a desirable set of characteristics. Although these characteristics may occur through spontaneous mutations (sports), new cultivars are typically produced through a long term breeding program.

Cultivar Protection, Licensing and Leasing

- **Plant Patents** for asexually propagated material, last for 17 years.
- **Plant Variety Protection** for inbred lines produced from seed.
- **Plant Utility Patents** for genes, etc.
- **Trade Secrets** for parental inbred lines.
- **Trade Marks** are words, symbols, or designs often combined with patents i.e. Sunblaze roses. Do not expire with the patent.
- **Proprietary Rights** to control propagation and marketing of a unique plant without a patent.

Once a cultivar has been legally protected, propagation by anyone other than the developer requires a license or a sublicense.

Generally a grower pays a **royalty** to the plant developer.

Growers cannot legally propagate patented plants without a license from the developer and must appropriately label each plant.

Illegal propagation of a plant is known as infringement and is **illegal.**
Advantages of plugs vs. open flat propagation

- Allow for mechanization
- Can be automatically transplanted
- Shorter production times
- Longer holding periods
- Reduced disease spread
- Increased crop turnover

Disadvantages of plugs vs. open flat propagation

- Difficult to grow
- Plug size restricts water drainage
- Dry out quickly because they don’t hold much
- Rapid EC and pH swings
- Require expensive seed sowing equipment
- Larger propagation area required
- Some species are difficult to sow and germinate
- Require high quality, expensive seeds
- Labor saving technology is needed

Seed Storage

- Try not to buy too much more than you need each season.
- However, some seed will be leftover and need to be stored.
- Temperature should be as low as possible but above 35°F.
- Humidity should be low.
- Store in an air tight container with fresh Dryright™ packets.
- Humidity plus temperature should = 70 or less.
- Seed of some species does not store well.

How a Grower can test his/her own seed

A simple method is to count out a certain amount of seed. Put the seed between two layers of paper towels, moisten and put in a plastic bag. Keep moist and warm (70-75°F). When germinated, count the number germinated. Divide # of germinated by # of seeds soaked and take times 100. If below 60%, don’t use that seed lot.

Four Stages of Plug Production

Stage 1 – radicle (root) emerges.
Stage 2 – root system and cotyledons emerge.
Stage 3 – first true leaves develop.
Stage 4 – seedling is almost ready to transplant.

Four Stages of Plug Production

The temperature should become cooler as you go from Stage 1 to 4.
The humidity should become less as you go from Stage 1 to 4.
Light may or may not be needed in Stage 1.
Fertilization increases from none in Stage 1 to regular CLF in Stage 4.
Plug Technology

- Automatic seeders
- Flat fillers
- Plug poppers
- Transplanters
- Dibblers
- Taggers
- Conveyors and other methods of moving
- Heating cables
- Growth chambers
- Containerized benches
- Boom or flood irrigation

Ways to keep the media as warm as the air

- Electric heating cables
- Unit heater with fan jet below the bench
- Wrapping the bench with plastic to the floor
- Biotherm® microclimate tubing
- Use a thermometer to monitor the media because moisture evaporating from the media will cool it.

Irrigation for plugs

- Mist, fog or high humidity chambers for germination
- Plastic sheeting
- Remay® or Vispore® spun fiber cloths
- Use high quality, low EC water
- Never let seedling dry out
- Booms or flood for growing on
- Low feed at 25 to 75 ppm N after 2 weeks if the germination media has no nutrients

Transplanting Plugs

- Transplant seedlings as soon as possible.
- Transplant when root balls can be removed intact.
- Delay in transplanting can cause stunting and induce flowering and lower the quality of the final crop.
- Growth can be slowed by lowering temperatures, water and fertilizer, if necessary.
- Plugs can be stored in a cooler.

Plug Connection - Vista, CA
Specialist Plug Growers

Established in 1987, the Plug Connection was the first wholesale ornamental plug producer on the West Coast. From the beginning, the Plug Connection has specialized in young plant production and remains one of the few specialist plug and cutting facilities in the US.