

PLUG PRODUCTION FOR THE SMALL GROWER

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When you talk about plugs, it's usually in reference to large producers. It might surprise you to learn that many small- to medium-sized growers are producing plugs in their own quiet and satisfying way. Why don't all of them buy in material from specialty propagators?

The answer is not the same for any two growers. Here are some of the reasons I produce my own.

Minimums per variety and per shipment are too rigid for my complicated retail needs. There are many times during the spring bedding plant season when I need to transplant one, two, even three 606 flats of a given variety. That's less than a full 288 tray, my standard plug size. Maybe it's my New England frugality, but I don't want to have to buy a whole tray just to dump half of it.

To battle the recession and mass merchandisers in our region better, our family business has made a commitment to specialize in new and different items. Our niche is to have one or two flats of an unusual color of impatiens or of a new and exciting cutting flower.

We work hard to keep up with these new offerings; it makes my life difficult, but it forces me to keep up with the times and learn more about plants. I can't tell you how many times my father hears customers say, "I have been all over and nobody has the selection and quality you have." He usually peeks his head around the corner into our bedding plant sales area, catches my attention, and winks at me in his characteristic way. Somehow, no matter how difficult business has been, those winks make it all worthwhile.

Variety offerings and availability also influence my decision to produce my own plugs. My mother has put together a very demanding selection of bedding plants over the years, and I've learned the hard way that pink is not pink is not pink. She suggests tasteful combinations for our customers and demands the right shades. This requires growing the pink from one series, the blush from another and the rose from a third.

All of my seed orders carry the permanent instruction, "No substitution without customer's approval." When a certain variety is not available, I want to decide on the replacement.

The varieties I grow aren't different from those produced by the specialty plug propagators. However, my complicated schedules can't be easily met with the flexibility I need if I buy my plugs.

I know the quality of purchased plugs may even be better than mine for several crops. I have overcome my

shortcomings as a plug specialist by oversowing those items or allowing an extra week's time to produce an acceptable transplant.

THE NUTS AND BOLTS

If you are going to germinate seed successfully, your propagating facilities must meet minimum standards, including constant bottom heat and intermittent mist or fog.

At our operation, everything from filling to sowing to germinating takes place in a 30- by 146-foot greenhouse. The 5- by 13-foot wire mesh benches are in a peninsular arrangement with 18 benches per side (a total of 36 benches). We use Biotherm root-zone heat. Each side of the greenhouse is equipped with three separate zones (six benches per zone) for temperature flexibility. Additionally, the first zone of one side is equipped with manual valves on each bench to provide the option of not using bottom heat.

We use intermittent mist one-half hour before sunrise to one-half hour after sunset, usually for six seconds every four minutes. Each bench has four brass misting nozzles (Figure 1) and each side of the greenhouse is operated by a separate Mist-A-Matic timer. Each timer handles six zones with three benches per zone. HID lights are installed over three benches in one zone.

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Thirty-three plug trays fit on each bench. Throughout the year, my weekly needs range from as few as one plug tray to as many as 300 in late February. I record each week's space requirements on a chart at the front of the house. I include bench space needed for seeds and cuttings each week. I handle the seeds and my brother handles the cuttings. The 36 benches are just enough to handle the rotations we need.

Space is very tight for a few weeks from late March to early April, and an occasional plug tray has to be sent out a few days early to make room for the next week's sowing. As the demand for propagating space diminishes in late April, four-inch crops of Non-Stop begonias, gerberas, or lisianthus are finished on available benches.

I don't germinate begonia, petunia, *Salvia farinacea*, and verbena as well as I would like. I am considering building a small growth chamber to handle these items, but oversowing by an extra tray here and there is getting me by for now.

A few years ago I bought a Seed-E-Z vacuum seeder; of all the new technologies in my greenhouse this one is worth its weight in gold. For such a simple machine to be so versatile, easy to operate, and affordable for the small grower is amazing. I added seed plates to accommodate 128 plug trays for geranium sowings and 72 trays for direct sowing impatiens for hanging baskets. I have five or six plates for 288 plugs with varying sized holes to handle everything from raw petunia to zinnia seeds.

We use Metro-Mix 350 for most of our plug germination. In a few instances, we sow directly into our own potting medium, a steam pasteurized mix of topsoil, sphagnum peat moss, and rockwool in a 15-60-25 blend. Each year, as I learn to control moisture better, I find I am germinating more items without covering the seed. With those items that do need covering, I use a finely textured vermiculite.

I cut some 288 plug trays into various sizes (quarters, thirds, halves) to allow me added flexibility. Now I can sow as little as a quarter of a tray and not waste space on the bench. And thanks to GreenShield, I can disinfect and reuse my plug trays over and over.

GROWING-ON AND HARDENING-OFF

I try to group and place crops on the benches according to their germination requirements. As a bench germinates, I reduce the mist and begin hand irrigating. I follow that with light fertilization, eventually leading to a fertilizer application in the morning irrigation, followed by clear water in the afternoon. It is almost a full-time job for me to tend to plug trays from February to April. I am constantly rearranging plug trays according to their mist, fertilizer, and temperature requirements.

Early in the season, plug trays that are ready to harden-off are moved to production greenhouses and grown-on at 60 to 62°F nights. By mid-March, as transplanting picks up, plug trays are hardened on the ground in 17- by 96-foot bedding plant houses (Figure 2), heated to the 55 to 60°F range.

SCHEDULING

A few years ago I calculated how many crop schedules I was dealing with on an annual basis. I counted each sowing of each variety as a separate schedule since each needed to be handled and recorded separately. My totals were close to 700 seed schedules and over 300 cutting schedules! Now you may better appreciate why I refer to my production mix as being a complicated one.

I spend a lot of time with seed catalogs in early August. It takes a week to review comments from the recently ended bedding plant season and rework my crop schedules. My desk is usually covered with five or six catalogs and price lists. It seems the seed companies go to great lengths to confuse the ordering process; each one has its own discount policies and break points.

Hats off to our suppliers for leading us to the world of high tech germination. Specialty seed is finding its way into my program as each year passes. I now buy pelleted begonia, lobelia, nicotiana, and petunia seed. My dusty miller is improved "germ," my marigolds are detailed, and my tomatoes are defuzzed.

Each season more crops are being offered by seed count and fewer by weight. I estimate three 288 plug trays per 1,000 seed, allowing for some doubles because the seeder is not perfect and a few extra as a cushion in case of problems.

CONCERNS OF A SMALL GROWER

Species of plants we have never seen before are appearing in our catalogs, plants that are exciting and different. As small growers, our success seems tied to these new and different crops. Our challenge is to learn how to grow and market them to our customers.

Will small growers continue to have access to these new varieties, or will a few large producers manage to buy up an entire crop, forming strategic alliances with suppliers along the way? I hope it does not get to the point where the small grower has to wait until the large producers get what they want.

Finally, as we begin another bedding plant season, I hope you are not afraid to try producing your own plugs. It is a lot of work, but very satisfying and rewarding.

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