

POT MUM PRODUCTION*

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In our discussion today, I would like to cover a few selected short subjects on some of the situations which come up quite often during my travels.

The 3C + 2M Method

Just 13 years ago, Yoder's launched the 3-climate, 2-move concept of growing pot mums. At that time and today, we do not say this is the only way to go, because no one system is ideal for everyone.

*Presented at 1979 Minnesota North Central Convention.

Moving pots was not new then. At that time we were trying to define desirable conditions for the various stages of a pot mum crop to improve quality, particularly Fall through Spring. It pointed out the area savings and fuel savings which could be achieved if one could justify two moves, and the third climate.

At that time in Ohio, coal was \$5.50 a ton (delivered), 12¢ a gallon for #2 fuel oil, and 67¢/M Cu Ft for natural gas. Today we pay \$40 a ton (at the mine); 49¢ for #2 oil, and \$2.10/M Cu Ft for gas with every indication it will go up again soon! Growers everywhere are facing similar situations with no end in sight for price stabilization on fuel. Fuel costs are going up faster than labor, and it may be worthwhile reappraising that extra move and third climate.

Starting at 65°NT, at a close spacing for two to three weeks, growing-on at 60°NT for five to six weeks at a wider spacing, and finishing at the widest spacing for four weeks at a temperature of 55°NT, definitely provides fuel savings. It's difficult to quote a savings that applies to every grower, because greenhouse conditions, outside temperature, and wind speed are involved in fuel consumption, as well as the 5° temperature drop for finishing. A 55°F finish for four weeks doesn't seem like much when you think of it just that way, but when you think in terms of time x area (Sq Ft Weeks), it takes on a different aspect because you are growing those last four weeks at the widest spacing. For example:

Using a 3C + 2M System

| <u>Spacing</u> | <u>Weeks</u> | <u>Temperature</u> | <u>% of Crop per sq ft weeks</u> |
|----------------|--------------|--------------------|----------------------------------|
| 6" x 6" | 2 | 65° NT | 5% at 65° |
| 10" x 10" | 6 | 60° NT | 42% at 60° |
| 14" x 14" | 4 | 55° NT | 53% at 55° |

Using a 2C + 1 M System

| | | | |
|-----------|----|--------|------------|
| 6" x 6" | 2 | 65° NT | 4% at 65° |
| 14" x 14" | 10 | 60° NT | 96% at 60° |

If you choose not to use the cool finish, you can still reduce your energy cost per unit with the increased production and net income from a move system in the same amount of bench area you now heat. Using the same spacings on a 3C + 2M system just discussed, on a weekly constant rotation (14.11 vs 10.11 Sq Ft Weeks per 6" pot mum).

| <u>System</u> | <u>Pots Produced/Wk</u> |
|--|-------------------------|
| 3C + 2M | 990 |
| 2C + 1M | 710 |
| Increase in pots per week | 280 |
| % of increase in production or decrease in area utilized | 28% |

Costing

This is 280 pots a week x 50 weeks, or 14,000 additional pots per year.

This provides an added gross of \$770.00 a week @ \$2.75 per pot x 50 weeks, or \$38,500 a year.

From this added weekly gross, you would have to deduct added costs of materials and labor for the extra pots produced. Additional costs per year are \$15,000.00 for a net gross of \$23,500.00.

One major concern of growers is the work of moving pots twice. John Lockner of Kirkwood, MO answered that concern in his talk on pot mums at the OSU 1978 Short Course. "We couldn't do without our double spacing. We'd need a third more space if we went to a full spacing from the beginning. We use mechanical equipment to move the pots. Two or three men space 1,000 pots in under half an hour

(1-1/2 man hours maximum). Note, by the way, the mat irrigation system avoids installing Chapin tubes in the pots for the first two spacings. One thing for sure: On a system like ours, you've got to space those plants on time! It's a matter of self discipline." Self discipline, or execution on time, is the name of the game, no matter what you grow!

Another concern that growers express is: What if pots back up on the finishing area due to slow sales or heat delay? Here are some thoughts:

- 1) Scheduling with a 10 week response provides a week's cushion.
 - a) Until experience is gained, move systems should be based on a 10 week response as in the example above.
 - b) Our listed response for a variety is at the 2/3 open stage. Most 10 week pot mums are sold tight as late 8's or early 9's, so you have about a week's cushion to clear.
 - c) Also, many new varieties have 7, 8 or 9 week responses. Sold tight, they will move off the benches in 6, 7 and 8 weeks respectively. They give you additional cushion in present programs, and more later, as these earlier varieties slowly become a bigger part of your production mix.
- 2) Depending on the situation, move pots to the cooler, packing area, walks or even a bed in another area.

Finally, keep in mind the multi-move concept can and should be applied to other pot crops to make your entire pot plant business more profitable.

Cyclic Lighting

In the past, electricity has not been a major cost but like all energy, it continues to increase and the long term projection for the costs of electricity is UP!

Cyclic lighting can save 60-80% of your mum lighting bill every year.

You only light 6 of every 30 minutes in the North during the prescribed 2-3-4 hour lighting period, depending on the season of the year.

One point of caution: You must have a minimum of 10 foot-candles at all points on each bed. You do not have the cushion that conventional lighting provided. Things to check: Inadequate spacing of bulbs, old wire, and power drain in the peak demand period that does not give you 10 foot-candles (if your greenhouse is located in a residential area).

Unit J-33 Cyclic Lighting Programmer handles 50 relays. Each relay will service 30 100-watt bulbs, or 50 60-watt bulbs.

Split Night Lighting

The most common procedure today is to light from 10 p.m. to 2 a.m. Vegetative growth can be maintained if some areas are lighted 9 p.m. to 1 a.m. and others from 1 a.m. to 5 a.m.

The significance of this is that many utility companies establish your yearly rate on the peak demand used in any 15 minute period. Split lighting cut the peak demand by 50%.

Combined with cyclic lighting, peak demand can be reduced significantly. Our stock program on split cyclic lighting is 25% of our original peak demand because we use a 50% cycle on our stock.

On flowering programs where a 20% cycle is used, offers even greater efficiency. Five stations lighted 6 minutes in each 30 minute period from 9 p.m. to 1 a.m., followed by 5 stations lighted the same way from 1 a.m. to 5 a.m., reduces the power used in any 6 minute period to 10% of the amount used without cyclic split night lighting.

B-9 Dips & Sprays

At certain times of the year, or with certain tall or long internoded varieties, the conventional B-9 spray just does not do the job. Plants get too tall, they lack compactness, or the plant stub stretches after pinching, causing up-right and/or top-heavy stems.

In addition to the regular B-9 applications, two approaches can be utilized on problem varieties, the pre-plant dip or a post-plant spray.

1) Pre-Plant Dip

Use 1250 ppm

- a) Hold a handful of cuttings by the root system; dip in the B-9 solution just long enough to thoroughly wet all leaves and stems. Then remove the pot. Allow B-9 to dry on the foliage before watering-in. Normally, by the time you are at the end of a bed, you can start watering-in those plants first potted.
- b) Unrooted - Remove unrooted cuttings from the box. Dip them in the B-9 solution, remove, and place in a flat. Cover with cheesecloth to avoid dehydration and place in the cooler over night. Stick the next day and go onto your normal misting program.

2) Post-Plant Spray

Spray rooted cuttings just as soon as the cuttings establish themselves. Approximately 3-5 days after potting.

The cuttings will respond to this early application once the root system begins to establish itself.

Concentration will vary from 1250 to 2500 ppm, depending on variety and time of year.

Benefits of Dips & Sprays:

- 1) Eliminates after-pinch stretch.
- 2) Develops breaks closer together and lower on the plant.
- 3) Produces a wider breaking action.
- 4) Sum total - a more attractive plant with a sturdier under-structure on troublesome varieties.

Reminders:

- 1) Work on all varieties (if required) except Spirit, Spark and the Intrepids.
- 2) The dip is more effective than the sprays.
- 3) Sprays are more practical for rooted cuttings, the dip easier for unrooted direct stick.

Multiple Bud Removal

Spray pots, both decoratives and daisies, are continuing to become a larger part of the total pot mum production in North America.

Most daisy varieties must be grown as spray pots, and they have created a share of the market. With decorative varieties, this development was probably due more to production needs than the desire to provide a new appearance to pot mums.

Spray pots eliminates disbudding costs and are especially helpful on holiday crops when all the extra disbudding can be a real labor problem. Besides the savings, I believe well grown spray pots can add a new dimension to your sales.

The market does not like clubby spray pots! "Clubbiness" of the spray formation is one difficulty growers encounter in their efforts to produce attractive, full spray pots with good flower placement covering the head of the pot.

Two basic approaches to minimize clubby spray pots are:

- 1) Avoid late B-9 applications. Apply the last application about a week before one would normally remove the center bud. Later applications shorten peduncles and dilute flower color.
- 2) Center bud removal. Removing 1-2 buds should be done as the lateral buds elongate away from the terminal bud far enough to conveniently remove the center bud(s). Two buds can be removed as easily as one, when one is not enough to open up the spray formation.

Unfortunately, these approaches did not always solve the problem on all varieties, so a new technique has been developed. We call it MBR, or Multiple Bud Removal.

MBR is different, and done much earlier than CBR or the traditional center bud removal.

How is it done?

Tip pinch each break that develops from the first pinch (the old Yellow Delaware tip pinch).

When is it done?

When a minimum of 4, maximum of 6 leaves have developed on the breaks, or when you can just feel the bud, but not yet see it.

If the leaf count is there, don't wait to feel the bud. Pinching a little earlier is better than being late. A late pinch causes uneven growth and response. If you see the bud before the proper leaf count develops, the variety is not suitable for MBR (Annes), but more likely the potential growth of the plant is not being maximized.

Benefits:

- 1) More attractive spray pots. Eliminates clubbiness.
- 2) Usable on many pot varieties.
- 3) Increases head size, particularly on up-right varieties.
- 4) Reduces height. Particularly on tall growers.
- 5) Eliminates cost and labor of one B-9 application on tall varieties.
- 6) Could be used to spread workload on holiday crops by growing a combination of disbud pots and spray pots which are handled with the MBR and CBR approach.

Reminders:

- 1) Minimum of 4 leaves before you MBR.
- 2) When you can just feel the bud or earlier.
- 3) Works on most disbud varieties except Annes and some of the soft flowered varieties.