

BRINGING HOME THE BACON BY SAVING HUMAN ENERGY¹

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Floriculture crops are physically demanding crops to both produce and market. For the producer, media preparation, transplanting, watering and moving both in and out of the greenhouse are the major labor users. For retailing at the garden center, chain store or roadside market, the setting up of the flats and pots, maintenance and actual sale are very demanding.

Some growers feel the business is really a materials handling business. When we consider most of our casual labor is \$3.00-\$5.00 per hour, it's no wonder labor-saving devices have been developed by many. The following outlines some of the major phases of pot plant production and ideas on labor-saving devices. We wouldn't be concerned about labor efficiency if our costs were like those of greenhouses in Bogota — \$2-\$3.00 per day, but our producers are under constant cost pressure with rising prices of fuel, plastic and labor.

Soil Preparation

Some growers buy prepared media in bales. In Ontario, these are usually growers who don't have a lot of labor and run basically one-man operations. Most of our growers, however, purchase the component parts (peat, perlite, vermiculite, sand and/or soil), and mix their own.

Mixing can be done in a manure spreader (hammer beaters), cement mixer (large or small) or a purchased soil mixer. One of the simplest ways I've seen is to layer out the components on a cement floor and then mix with a rototiller. It is easy and involves a minimum capital investment. Some growers mix their soil right in the greenhouse where the crop is to be grown — putting in the correct amount of soil for the number of flats needed. A few people are in the custom soil mixing/delivery business. This involves large equipment such as a loader, shredder and screener for blending or delivering.

For soil pasteurization we are using a granular soil fumigant. It is worked into the soil with a tiller, covered for 2-3 weeks, then worked up and the soil is ready to use. Costs are about 25% of steam pasteurizing.

Flat and Pot Filling

There are a multitude of flat and pot fillers on the market ranging in price from \$100 to \$12,000. A simple type

developed by a grower with about \$100 worth of old parts fits most of the requirements for a good flat-pot filler. It is easy to move around, simple, and can be readily adapted to larger operations by attaching a larger soil mixer-hopper. These are now being "mass produced" so the price is closer to \$1,000.

One of the real good labor-saving devices seen at this year's SAF Grow Show is a gadget that will pick up a tray full of pots (3½" or 4½") out of the cardboard shipping box and place them into a flat. You can pick up 18 pots at a time rather than one or two.

I like the idea of putting the filled flats or pots on skids so they can be moved to the transplanting area by forklift. This allows you to use school kids to do your filling at night or on the weekend for the next day's or week's transplanting needs.

Seeding and Transplanting

Attach a delivery spout to an electric razor or clippers for very even flow of seeds onto your medium. Electric hand seeders can also be purchased but many growers just make up their own with old razors.

I like to use a seed flat that is divided into rows. They are not only easy to get out for transplanting but also confine any disease problem within the one row so as not to ruin the entire flat.

There is a lot of interest in direct seeding to minimize transplanting costs. Simplicity is the key in this area, and one of the simplest systems is the one used at Speedling. The pelletized seed is set on a perforated plate that allows only one seed per hole. By sliding a second plate underneath, the one seed per hole is delivered down a poly tube to a pre-punched cell. A paint brush is used to get the seed into the small holes.

There are a few new, more complex designs out in seeding machines but I have seen a few collecting dust in greenhouses. So be sure yours is simple or it can be very frustrating. Direct seeded crops can include marigold, zinnias, dahlia, salvia, alyssum, portulaca and some vegetables.

For transplanting, I would suggest a foot-operated dibble board to fit ahead of your transplanting line. This is relatively inexpensive and is a lot easier on the operator than the hand-operated ones.

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I like a transplanting line on a conveyor belt where each person puts plants in a predetermined spot. This can be 2, 3, or 4 plants depending on the speed of the belt, the variety and how many people are working that day. The person at the end can check to ensure each person is planting properly. The label can be inserted and a watering can be given right on the conveyor before going to the growing area. It is a good idea to have the "line" on wheels so that it can be moved to your different greenhouses. This system ensures an equal number of plants are done each hour and especially just before or after coffee break or lunch. It also uses the "team approach" which some people managers feel is good.

There are a couple of mechanical transplanters, such as the Blackmore, in Ontario. The growers who have them are very mechanically inclined and this I feel is a requirement at this stage in technology.

Watering

Watering can make or break the bedding plant crop. A couple of ideas may make the job easier for you. The Van Wingerden "Come-Along" system hangs the hose overhead, suspended on wires and rollers. This allows you to pull the hose 50' in either direction of the water header and not have it "hang up".

Another idea was recently observed at Greilings in Wisconsin. The watering hose is coiled on a car wheel and hub so it can be quickly rewound. This is portable (on wheels) so can be moved from section to section. It also is equipped with a quick coupler so can be easily connected to the water header. In order to keep the hose from pulling over the flats, roller guides on metal stakes can be placed into the cement. These can be moved from section to section.

For spaghetti watering of hanging baskets, some growers use 3/4" or 1" galvanized water pipes to support the baskets and have them drilled to accept the spaghetti tubes. This gives you the support and water system in one. The water pipe must be level and a loop must be tied in the spaghetti so it does not putt out.

A portable fertilizer injector that can be moved on wheels from greenhouse to greenhouse is also a labor saver. I like

the Smith or Gewa types as they are very accurate in their proportioning.

Structures — Heating — Cooling

Many growers roll up the sides of their cold frames with the aid of a pipe with a handle. These can be tied up at the peak during the day and easily unrolled to close up for the night. Some growers buy or rent portable heaters (oil, kerosene or propane fired) to move into the cold frames at night. The only thing to keep track of is adequate fresh air for the burner (1 square inch per 2,000 Btu's).

One of the slickest ways of putting on Sun Clear (anti-drip spray) is with an air compressor with a siphon sucking up the liquid. It is fast and gives a nice even spray. It is also useful for applying shade.

Some growers have hooked a pipe onto their front end loader to lift the rolls of poly up onto the roof. There are many designs for this, depending on how high the greenhouses are and whether you want to lift up the poly or have it suspended over the ridge and unroll it from the spool.

Moving and Shipping

There are many ways to help speed up the shipping of plants: push carts, double-decker wagons, racked carts, rollers and the like. Many growers rent trucks for shipping and rack them. An idea is to weld up side supports (1" pipes with L-shaped hooks every 10-12"). These are clamped to the truck sides with 2" x 4" boards running along the hooks on the side of the truck. Shelving (1" x 10") etc. can be supported by these 2" x 4"s.

Other growers who ship to garden centers with asphalt-cement have made up many wheeled carts (multi-tiered). These are loaded in the greenhouse, pushed out to the truck, loaded with a mobile tailgate and rolled into the truck. This really saves at both ends of the delivery. Some growers have their loading ramps cut down into the ground — below the greenhouse floor level. This allows carts to be pushed directly onto the truck and is faster than a tailgate loader.

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