

were as follows: (1) one week before cuttings were stuck in mix, (2) the day that cuttings were stuck, (3) one week after they were stuck, (4) when cuttings began to root or callus, (5) after they had rooted and mist was cut off, and (6) after the pot was rootbound. I was very surprised to find that I got the same results regardless of when I put out the herbicide. All cuttings rooted with the normal 10 percent or less mortality.

We feel that the safest time to put the herbicide out is 7 to 10 days after the mist has been cut off, which gives plants time to adjust to the absence of the mist. The area is weeded just prior to application.

## COST OF LINER PRODUCTION AT CARTWRIGHT NURSERIES

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We are all familiar with the increased costs in the production of nursery stock. Labor is our largest production expense. This fact has prompted us to try new techniques in liner production. As an example we found that if we reduced our labor force by 10 people, we could maintain our expenses at the same level as operating costs increased. Using the smaller work force did not allow us to increase productivity but did help us to maintain our production costs rather than increase them. Following is a description of our liner production system.

First of all, we use sand as a rooting medium because we can obtain this material within 15 minutes after we have ordered it. We use a mixture of 50 percent sphagnum and 50 percent Michigan peat for a potting mix. The liners are potted in rose pots and bedded in our lath house with about 1/4 to 1/2 inch of sand over the top. The sand helps to keep them from freezing out of the pot and also helps to hold moisture. These liners are grown here for one year and then planted or sold. During this period good cultural practices are followed. Plants are weeded, treated with insecticides, fertilized about twice with a foliar fertilizer, and given any other needed attention.

The itemized per unit cost of the liner production operation is as follows:

Sticking cuttings . . . . . \$ 0.01	Soil for potting . . . . . 0.01
Potting . . . . . 0.015	Maintenance and repairs . . . 0.01
Weeding . . . . . 0.01	Pots . . . . . 0.01
Fertilizer . . . . . 0.02	Bed preparation . . . . . 0.02

Supervision .....	0.02	Heat (natural gas) .....	0.035
Employment taxes & insurance .....	0.04	Depreciation .....	0.005
		<b>Total Cost Per Liner</b> .....	<b>\$ 0.205</b>

We follow several practices that help cut the cost of producing liners. We are continuing to stick cuttings in the summer under mist. A large percentage of them will root and be ready for potting before winter, which reduces the cost of heat. We are also going back to one of the older methods of rooting. We are sticking cuttings in the winter in inflated poly houses with no heat. We leave them undisturbed until spring, at which time they will root and be ready to pot around June or July.

We formerly tried to maintain a 65°F bed temperature in our greenhouses. However, the price of natural gas continues to rise and we have decided to change to 50°F. We feel that the 50°F will still be warm enough to give us a certain amount of rooting during the winter.

Finally, we have found it is very important to keep a close count on the units a laborer turns out per hour or day. This makes it possible to identify and replace slow employees. In our area it is not difficult to hire new help at the present price of labor.

In conclusion there are three suggestions that can help a firm cope with inflation and stay in business: (1) Purchase only what is essential. (2) Keep good records of what each individual laborer does each day. (3) Watch finances as closely as possible.

## **SO YOU WANT A CLEAN NURSERY?**

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The objective of having a clean nursery must be important to management for it to be achieved. It must be top priority and it cannot be accomplished without work. By a "clean" nursery we mean one with a minimum of weeds. Plans are important and it is much easier to carry out those that are committed in writing.

Identification of the weeds to be eliminated is the first step. We have found the *Growers' Weed Identification Handbook* (1) published by the Agricultural Extension Service, University of California, to be very helpful. It has full color photographs and descriptions of most weeds. It also shows the weeds in both juvenile and mature stages.