fronted with difficult logistical problems with large plants grown with the traditional heavy mixes. Use of PPP-grown plants would eliminate many of the problems presently encountered during installation of large plants indoors. Since both production and installation of large plants for interiorscapes are rather specialized professions, it is reasonable to assume that people in these professions would accept a new concept of plant production in a relatively short time.

One of the most serious obstacles to the use of the PPP with large plants is devising some systems of plant support during production. The heavy mixes now being used greatly assist in keeping large plants from tipping over in shadehouses and open field situations where wind is a factor. With a little effort effective support systems can be designed to prevent plants from tipping over in the nursery.

Acceptance of the PPP system of plant production rests with proper introduction of the concept to selected specialized producers and users of the product. Ultimate acceptability of the system is dependent upon economics of manufacturing the PPP and getting one or more of the potting media blending companies to package the product in units of the most desirable shapes and sizes.

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AN OLD ROOTING BENCH REVISITED

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In 1972 Morrison's Farm and Nursery began as a hobby-type operation with the construction of a shade arbor for the rooting of plant material and a hot-house for the growing of foliage plants. We were originally in the chicken business and still do have two houses in production. From this meager beginning blossomed the present operation, which encompasses an area of 80 plus acres of production.

During the past 24 months our nursery has doubled in size. This accelerated expansion demanded a rapid method to propagate plants in large numbers. The method chosen to accomplish this necessary production of plant liners was the rooting bench procedure. This type method allows a large number of cuttings to be placed in a small area while the rooting process is taking place.

The benches chosen for our needs contain 648 ft^2 each. Each bed is 6 ft. wide and 108 ft. long. These benches are laid out using concrete blocks for the lower portion of the bench. Each bench requires 170 concrete blocks laid loosely to allow water drainage to seep between them. These blocks are then filled level full with cypress *(Taxodium distichum)* sawdust. This sawdust allows drainage below the rooting medium and serves to collect and store heat at the base of cuttings.

The second step is construction of the rooting area itself. This section of the bench is constructed on top of the concrete blocks and contains the rooting medium. Cypress boards are used to make forms 6 ft × 7 ft × 4 in. These forms are placed on top of the concrete blocks with woven soil covering placed between the forms and the concrete blocks and sawdust. One hundred percent shade cloth could be used for this purpose. This upper section is then fitted with irrigation.

Two types of mist irrigation have been tried for these benches. The first type is a fog system consisting of Geor-Jet mist nozzles fitted to PVC risers extending 6 in. above the rooting medium. Unfortunately, these clog easily. The supply lines for this system are laid directly upon the cloth divider under the upper rooting forms. Mist nozzles are spaced on 4-ft × 4-ft settings.

The second type of mist irrigation consists of Spraying Systems brass-nozzle type heads. These heads are attached to ¼-inch steel rods, which can be lowered or raised depending upon plant material placed under them. The head is connected to the lateral lines by flexible plastic tubing. These heads are spaced on 7-ft. intervals with one line per bed.

Both mist nozzle assemblies are connected to electric valves with a 10-min. timer. This timer can be adjusted for a mist cycle with intervals ranging from 2½ sec. minimum cycle to a higher "on" time, as needed for uniform coverage.

The rooting medium consists of the following mixture:

18 ft^3 Canadian peat moss	1½ lbs. Micromax micronutrient
20 ft^3 perlite	30 lbs. dolomitic limestone
27 ft^3 raw pine bark	8 lbs. Osmocote 18-7-11

This mixture is placed inside the forms constructed and is

allowed to settle before usage. The final grade for this mixture is level with the top of the wooden forms.

Cuttings are then stuck into these prepared areas. We have been able to stick approximately 4500 to 5000 cuttings per wood-form unit. This allows each 6- × 108 ft. bench to contain 67,500 to 75,000 cuttings in an area containing 648 ft^2. We can, therefore, propagate approximately 110 cuttings per ft^2. Using this method of propagation, we can produce very large numbers of rooted liners in a limited space.

Cuttings taken for rooting in these bench areas vary in size from 2- to 6 in. in length. Cuttings such as *Ilex vomitoria* 'Nana' are the shortest in length, while cuttings such as oleander are longer. Most plant material is placed into the benches without the addition of hormone. Hormone compounds are used on plant material that may show accelerated root formation when treated. Most material will root in an acceptable length of time without hormone addition. This rooting is enhanced by the added heat supplied by the sawdust under the rooting bed. Bottom heat in propagation areas has always seemed to enhance the rooting of cuttings.

IMPROVING UNIFORMITY IN CONTAINER NURSERY STOCK

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Abstract. Poor uniformity in container-grown nursery stock increases production and labor costs and decreases effective space utilization and customer satisfaction. Ten major factors that affect crop uniformity are discussed and suggestions are made for improvement.

INTRODUCTION

In most container nurseries poor crop uniformity is a subtle but major factor affecting production costs and customer satisfaction (5). Studies suggest that production costs in a container nursery should be assigned on a square foot of production area per month basis (3,7). With this approach some nurserymen estimate costs based on the period from planting time until sale of the first portion of that crop. However, in many cases the time between the sale of the first portion of the crop and the last may be from a month to a year or more. A more realistic procedure would be based on the time from planting until the last plants from that crop are sold and the space is