

MECHANISED NURSERY PRODUCTION

ROBERT MILLER

*Broadhouse Farm Nursery
Cutnall Green, Droitwich, Worcs.*

I want to show you how we produce cuttings, on the understanding that we are a young nursery, and have only been in existence for five years, four years on a full time basis. We started with an empty field and built a nursery to suit ourselves, so in theory we have no hangover of old habits and practices. After two years we built a purpose-designed barn which incorporates a separate propagation room. It is built of brick and fully insulated, with tiled floor and walls, so that it can be heated and easily washed down and sterilized. There is a bench and comfortable chairs for the workers, and good lighting conditions.

The only "mechanical propagation" is knives and secateurs, the tools of the trade. We employ two girls full time on propagation, and we hope they will do 2000 cuttings per person per day, which includes insertion and putting out the trays on the benches. In twelve months we do 600,000 cuttings, on a 300 working day year. Secateurs are used more than knives as the girls find them easier to handle.

We keep a full record of every batch of cuttings with dates of propagation, potting on, and numbers of plants at each stage, etc. The staff do this themselves, and the records are kept through to point of sale.

The plastic trays we use are made by Allibert in France, and are not common on English nurseries. They measure 24"×18" and are easy to handle. We like this tray for the number of cuttings it holds, and, more important, is the 32% space area in the base which is physically in contact with the sand on the propagation bench. There is very good heat transfer, and at any one time there is only a 2° to 4° difference in the bench and compost temperature. With the traditional seed tray the base is solid and this temperature differential can be 12°, so up to 8° is wasted in achieving the right temperature in the compost. The French trays have very good drainage, and can easily be sterilized by dipping or fogging in a sealed chamber. They are very tough and we expect a 10 year life, whereas similar trays from Holland at half the price are not UVI inhibited and break sooner.

We have a typical mist house with a three foot bench each side and a six foot wide one in the centre. These beds are laid out to take our trays exactly, so that no space is wasted. There is a conventional Macpenny mist system, and electric heating cables are buried on each bench, controlled by two thermo-

stats per bed; which allows us to switch off part and save heat. The beds are lined with polystyrene and this has given good control of heat.

The centre bed is watered from a coarser nozzle operated by a timeclock, and this has been quite suitable for broader leaved and evergreen cuttings. We put 40% shading over the roof, with an extra Lobrene shade cloth on the south end of the house. In the winter months we use polythene over the beds instead of mist. Paths are such a width that we can balance a tray across on the bench walls to make inspection easier.

A Robinson house has been put up for propagation, and the bottom heat in this is provided from hot water pipes buried at 6¼" centres and 6" depth. The water is heated in a domestic hot water boiler of 120,000 BTU capacity burning 28 second oil. Nobel control units operate circulation pumps which pump water at 120°F through the flow pipes, and it returns at 115°F. The heat control is very accurate; even in the last cold winter we had only a half degree variation, while we had 12° variation within beds heated by soil warming cables. More significantly, the hot water system costs only half that to run compared to electricity.

A bench in this house is 8 feet wide and 91 feet long. It is constructed with walls of 9" concrete blocks, and is lined throughout with 2" polystyrene, and filled to a depth of 7" with sand, the hot water pipes buried at 6". Polythene is draped over the beds, as so far we have no mist. It is used for shading and as a thermal screen, and we use different types and densities at different times of the year. In winter it makes an effective thermal screen, and temperatures under the polythene have been 6° to 7° higher compared with the glasshouse temperature. We maintain the latter at a minimum of 1°C. In winter we lay Xirofilm directly on conifer cuttings, but support it on hoops over softer material.

For our potting operations peat is stored in the barn, and a conveyor takes it to our Alvan Blanch soil mixer so one person can do the mixing. We make a peat/sand mix and use Q4 fertilizer, and the mixer delivers it directly on to the potting bench behind.

The cutting trays are stacked 20 high on plastic dollies with four wheels; with an iron handle attached we can pull these trollies over concrete floors. Another mechanised handling trolley is based on a hospital trolley, and holds 10 Allibert trays which can be slid in at the sides so there are two side by side. There is one pair of wheels on the front, and the

back pair are fixed, and it will turn in its own length. Two wheels on each side guide it along the walls of the concrete paths in the glasshouse.

Once cuttings are rooted they are brought on a trailer to the potting shed. We handle the potted cuttings in Empot carriers which take either 7cm or 9cm pots, and we developed a racking system which can be simply transferred on a track to the trailer. We pot by hand, and pots are transferred to the Empot racking. The trailer will hold 2000 pots, a morning's work for our two women. In the polythene houses we have more tracking for unloading racks from the trailers, or for loading up customer's orders later.

For weed control in the containers we have designed a boom to span a 7'6" bed; this has been an adaption of an old sprayer.

N. ROBERTS: Do you have any restrictions on the use of secateurs for cuttings of certain subjects?

R. MILLER: We do not use them on brooms or any *Cytisus* spp. or any soft material such as *Hypericum*, *Cotoneaster* and *Cornus*. With *Senecio* knives make a better cut, and for skilled labour I feel knives are better.

N. ROBERTS: Do the people doing cuttings collect their own material, and does this affect the rate of work?

R. MILLER: They collect if we have our own stock plants; the rate depends on material. We use shears on some species, but for difficult subjects such as *Berberis* it is a morning's work. We expect to do 2000 per day; taking and making cuttings is done in one stage and sticking is done outside the propagation room.

S. FRASER: With a temperature of 120°F in the bench heating pipes, what is the temperature at the base of the cuttings?

R. MILLER: 18°C (68°F). With 6" of sand over the pipes we get a very even and constant spread of temperature. Shallower sand means hot spots.

D. WHALLEY: Could you give more details of the shading?

R. MILLER: We have 40% net shading on top of the glasshouse, then a thermal sheeting 6' above the beds, but this is only on in hot sunny weather, making a total shading of about 62%.

A. WOOD: What is the cost of the trays?

R. MILLER: In small quantities, the Allibert trays cost £3 each, and the similar Dutch tray £1.39.

B. RIGBY: Did you make your own trolleys, or were they made by an engineer who could supply to the industry?

R. MILLER: Most roller conveyors clog with peat, so we consulted an engineer when we decided to build a system around the Empot carrier. It is too expensive to patent the idea, but I am prepared to sell the drawings. The handling time to unload the trailer is 20 minutes for 2000 plants; this is impossible to do by hand.

R. EVISON: Do you overwinter young plants in the trays, and do they get starved?

R. MILLER: We use no fertilizer in the compost, but we now top dress Q4 as soon as the cuttings are rooted and water it well in. Most get one application before they are potted.

R. EVISON: We are using smaller but deeper trays with a potting compost in the base and a normal cutting compost on the top. It has been very successful, but we shall have to see how they overwinter.

COST EFFECTIVE PROPAGATION USING POLYTHENE STRUCTURES

ROBIN B. TACCHI

Tacchi's Nurseries

Banks End, Wyton, Huntingdon

When I left college some 13 years, or so, ago; with ambitious plans to turn a small family retail firm into a production orientated wholesale business, there were three factors which determined our propagation set-up:

Firstly, large amounts of money were not available;

Secondly, the lack of any existing conventional propagation systems, which allowed me to start from scratch with a fresh approach. People are reluctant to change what they already have!

Thirdly, the reluctant realisation by horticulturists that polythene did have applications other than wrapping sliced bread, and that it might even be used as a glass substitute.

Using this magical substance it became apparent that not only did it work, it enabled one to erect large areas of propagation covering, simply and with a low initial expense.

I say initial because, over a period of time, re-cladding