REDUCING COSTS BY CHANGING FROM INTENSIVE TO EXTENSIVE PROPAGATION METHODS

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When we speak of reducing costs we usually think in terms of cutting down on the use of our resources — reducing our use of land, labor and capital. But, by contrast, the propagation methods we are using require *more* space, *more* labor, *more* time and therefore *more* cost — but they do reduce the overall cost of producing a saleable plant.

I should say, however, that none of these ideas is new. We have merely adapted the methods used by other people or, in some cases, our own methods used by other people or in some cases our own methods but we think that they are useful. We have selected four examples to illustrate what we are doing.

(1) For a start consider pyracantha. We used to put the cuttings in seed trays in a conventional mist house and, being economical people, we put 54 cuttings in a tray. When they were rooted we knocked them out and potted them into 3" pots to overwinter in the glasshouse ready for containerizing the following spring.

There were two problems with this system — firstly, it meant double handling so we considered how we could cut out one operation. And secondly, we were getting a very high rate of loss. So we tried putting the cuttings directly into small pots. But using 2¾" square pots we only get 15 to a seed tray, which takes up a great deal more space, so we moved them out of the mist house and placed the trays on the floor of the glasshouse. Over the cuttings we have an ordinary irrigation line linked to a solenoid and a time switch (no bottom heat) and the cuttings root here in 3 to 4 weeks. They are then left *in situ* until they are ready for containerizing in the spring.

Of course it costs more to put the cuttings in pots than it did to put them in seed trays — more in terms of labor, compost, pots and space but we do save one potting operation. The comparative costs are:

Cuttings in seed trays:

collect, make and put in 100 ph @£ 1.40[1]	1.4 p.
seed trays @ 13p for 54 cuttings	0.25
compost, including mixing 3.6p/tray	0.67

[1] Ed. Note. In November, 1975, the British pound was equal to about $2.10.

mist, 2.5/tray/wk for 3 weeks	0.14
weaning	0.14
potting 100 ph	1.4
pots	1.0
compost	0.25
watering	0.25
glasshouse space @ 10p/sq. ft/ann	0.5
	6.00p.

Losses up to 50% - overall cost 12p.

Cuttings in Rapidex pots:

collect, make and put in 100 in 110 mins	1.54
seed trays (used at least twice)	0.50
pots @ £ 16 per 1000	1.6
compost	0.25
sprayline, solenoid and time switch	0.01
glasshouse space	0.5
	4.40

Losses 5% - overall cost 4.62p.

So we save a little by using the second method but the really significant difference is in the losses.

This seems to be a useful method of rooting many of the plants which will not tolerate root disturbance. We use it with slight modifications for viburnums, large-leaved cotoneasters and *Ceanothus* 'Gloire de Versailles', etc. as they can put on a bit of growth before being containerized.

(2) Another subject which now takes up a great deal more space than it once did is *Hypericum calycinum*. We used to put our cuttings into seed trays — about 50 cuttings to a tray (or 450 to the square metre) and then plant them out. We estimate the cost of this method as:

collect, make and put in	1.4
seed tray, compost and house	0.5
knock out, prepare and plant	1.0
weeding, etc.	2.0
	4.9

losses 40% - overall cost 6.86p.

Now we put out cuttings (unrooted) directly into the field and get just over 40 to the square metre! As I said before, this method is not new, in fact, our friends across the Atlantic were using it at least 20 years ago. But we haven't yet seen anyone else using it in quite the same way that we are.

The land is first cultivated and treated with Basamid and then a layer of sand is spread over the entire surface. If we were on lighter soil this probably wouldn't be necessary - in fact we have

omitted it on one occasion elsewhere — but the soil on this particular site is heavy and clayey; the sand makes it easier to insert the cuttings, helps to hold down the polythene and improves the soil for future use. The bed is then marked out, the cuttings collected and put in (we don't bother to "make" hypericum cuttings these days — just cut them off and put them in) about 150mm apart, give them a good watering and cover with weldmesh and polythene. The weldmesh is cut into short lengths from the roll so that we are left with "legs" which push into the soil and we dig out a small trench along each side in order to bury the edges of the polythene to hold it down. We used to use white opaque polythene, which was much better, but as we can't get it to our specifications now we either cover the tunnel with thick layers of lenoweave or brush on ordinary glasshouse shading. (Incidentally, shading won't stick on new polythene but as we use the sheet two or three times we use lenoweave the first time and shading on subsequent occasions.)

The cuttings usually take 3 to 4 weeks to root, then we hook up the sides of the polythene at intervals to let in some air and after a week or so take the sheet off and use it again. If the cuttings are put in in May, as soon as the shoots are long enough to handle, they don't need watering until they are rooted. Some of the plants are big enough to sell in the following winter — 7 to 8 months from cuttings. We grade out the biggest and leave the others for another year. If we don't get the cuttings in until June we have to put in a sprayline which increases the cost and, as they don't get away so early, the percentage saleable in the first year is very much lower.

The cost of this method is:

Basamid @ 10p/sq metre (42 cuttings)	0.3
Sanding £ 10/bed (1600 cuttings)	0.7
collect and put in @ £ 1.40/hour	1.4
polythene and weldmesh	0.2
weeding, stopping, etc. 10 hours	1.0
	3.6

losses 20% - overall cost 4.32 - compared with 6.86 for the original system.

By the same method we are also rooting other hypericum cultivars and laurel, including the dwarf laurel cultivars, putting the cuttings in during the autumn and winter. And during the summer we put in any easy rooting subjects such as *Forsythia*, *Philadelphus* and *Potentilla*, but these need a sprayline which is hand-operated three times a day, gradually reducing the amount and frequency of watering as the cuttings begin to root. This increases the cost by 0.5p per cutting, but by spacing the cuttings we aim to undercut the plants and sell directly from the bed.

This is all right for plants which will be sold bare-root but basically we don't like the idea of putting cuttings in the ground and then digging them up and potting them so we looked at the possibility of putting the cuttings directly into a pot in a similar tunnel — and the results are as follows:

(3) Frames were constructed using concrete blocks for the paths with the whole thing being on a slight slope for drainage. A sprayline was placed along the centre of the frame, the pots stood down and filled with compost, the cuttings put in, watered, then covered with weldmesh, polythene and shading as before. Once rooted, the polythene, weldmesh and sprayline can be moved away and used again and the plants sold directly from the frame.

The alternative, of course, is to root the cuttings in a cold frame and dig them up and pot them. The comparative costs are:

Cuttings in cold frame —	
collect, make and put in 100/hour @ £ 1.40	1.4
cost of frame and dutch lights	0.2
compost and frame preparation	0.05
watering, shading, etc.	0.6
lifting	0.014
potting	2.8
3½" poly pot	0.3
compost	0.8
	6.164
Cuttings directly in pots —	
collect, make and put in	1.54
pots (2¾" square)	1.6
compost	0.25
watering	0.3
frame construction	0.2
weldmesh, polythene and sprayline	0.1
	3.99

We found that many subjects such as cotoneasters, *Euonymus* and *Hebe* rooted very well like this but we then had several frames full of liners which still needed containerizing so we now confine this method to ground covers, such as *Vinca* and *Hypericum calycinum* which can be sold in a small pot, sub-shrubs such as *Pachysandra*, rosemary, *Salvia* and *Santolina*, which can be put in a 4" pot, and a few liners which we want for our own use.

(4) The other subjects which rooted well under these conditions now go into a larger pot. We tried senecio in poly pots in these tunnels and they did reasonably well provided that the weather was coolish and we didn't have to give them too much

water. However, poly pots are not ideal in these small tunnels as it is difficult to see what is happening without taking the top off two or three times a day so we moved back into the glass house. We would prefer to use a walk-in poly tunnel but did not have one available at the time. Here we put unrooted hydrangea cuttings directly into a 5" poly pot (2 cuttings per pot) with a sprayline operated by a time switch; they rooted in about three weeks. The same method is particularly successful with *Caryopteris*, *Fuchsia*, hebes and *Ampellopsis* . . . all of which we used to root in seed trays and then pot on.

The comparative costs of the two methods are:

Cuttings in seed trays:

collect, make and put in 100/hour @ £ 1.40	1.4
seed trays	0.5
compost, including mixing	1.4
mist	2.5
weaning	0.14
potting — 40/hour @ £ 1.40	3.5
5" poly pots @ £ 5/1000	0.5
compost	3.00
glasshouse space	0.62
	13.56

Cuttings directly into poly pots:

collect, make and put in 30 pots/hour	4.7
5" poly pots	0.5
compost	3.00
sprayline, solenoid, time switch	0.3
glasshouse space	0.62
	9.12

However, like any other system there are problems:

(i) First of all, there is the problem of additional cutting material as we are putting two and three cuttings to a pot; and it is difficult enough sometimes finding material for one cutting per (hoped for) plant.

(ii) Secondly, there was the unexpected problem of over-production because some of the plants we produce in this way are saleable earlier than those rooted in seed trays and because we didn't suffer the losses to which we had become accustomed.

(iii) Thirdly, there is the problem of timing; because we are pushing more and more of our propagation into the summer months, we run into difficulties with holidays and other outside jobs which demand attention. If one is not careful there could also be the problem of what to do with the propagation staff in the

winter; although I don't see that as being much of a problem for us as we have several other ideas lined up.

(iv) Finally, there is the problem of space, which is an ever-increasing concern as we think of more and more subjects which we would like to try on the extensive system.

Once we were content with a small mist house and a few cold frames; now our propagation area extends to nearly three acres and we're still looking for more but if it reduces the cost of production it will be well worth it.

A TECHNICAL DESCRIPTION OF THREE PROPAGATING UNITS IN GUERNSEY

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The past four years in Guernsey are remarkable from a plant propagation point-of-view because a large and concentrated horticultural area — some 2000 acres on a small island — took a great leap into the propagating business; because there was little experience in any aspect of this particular field there were many unexpected problems. In any event, out of over 30 nurserymen initially interested, less than 10 remain in business. However, one of the benefits of this lack of experience was an open mind — uncluttered by previous conceptions. We were fortunate in having a large equipment industry backing up the existing tomato and flower crops, and so the open mind and technical expertise got together and produced some most interesting and advanced propagation units. These units only worked when they had been evolved with the closest co-operation of someone experienced in propagating the particular plants concerned.

I shall describe the technical side of three propagating units that were built for very different purposes. You will notice many similarities in them because we all came to the same conclusions on many basic design points.

John Allen had the idea, which he developed with George Thorburn, of establishing from scratch a large wholesale business for hardy nursery stock. The site was a not too old tomato nursery in a fairly exposed situation. George Thorburn's experience stemmed from Holland and Germany and he knew only too well the importance of an extensive plant list. He embarked on the production of a wide range of plants including rhododendron, camellia, deciduous azalea, skimmia, mahonia, magnolia, miniature roses,