

THE RAPID PRODUCTION OF ERICAS, CALLUNAS AND DABOECIAS

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Trends and developments. There is a modern tendency to use ground-cover plants for areas where low maintenance costs are necessary. As a result, the mass market for such subjects is rapidly increasing and the nurseryman had the opportunity of filling this need by growing large numbers of ground-cover plants, reasonably priced. The especially suitable growth habit of these plants and the sensible use of modern herbicides will reduce maintenance to a minimum.

Heaths and heathers are examples of subjects being more commonly used for such purposes, and whilst generally in good supply are often too expensive to be considered for this role on a large scale. The costs and system of production dictate the selling prices and, as a result, these aspects were investigated at Kinsealy to ascertain how best to produce saleable plants that: (a) require the minimum handling during the various stages of production, and (b) spend the shortest time in the nursery after propagation.

Production systems. The following production system should quite easily fit into the nurseryman's propagation year. The system aims at cutting handling costs to a minimum. Cuttings of *Erica*, *Calluna* and *Daboecia* species are inserted in moss peat in a glasshouse bench, with a base temperature of 21°C. The cuttings are covered with 80 gauge polythene film. The bench is ventilated at intervals of ten days and after one month (*Calluna*, *Daboecia*) and two months (*Erica*) the plastic film is pierced in a number of places to allow air to circulate freely amongst the plantlets and thereby reduce gradually the humidity under the plastic. After some more days during which the hardening off process is completed, planting can commence in a 4 in. layer of moss peat in simply constructed wooden frames at a spacing of 3-4 in. between and within the rows. After the plants are watered in, the frames are covered with shaded Dutch lights or white opaque polythene.

The feeding programme can commence some days later. A 1% solution of a liquid feed containing 9% N, 9% P and 7% K together with trace elements is applied as a drench. When the plants are firmly established and growing (May) the lights are removed. The liquid feeding is repeated at fortnightly intervals until early September. It is necessary to trim the leading shoots of the

APPENDIX 1 — DETAILS OF PRODUCTION

October/November. Mother Crop — During the autumn period 5000 mother plants are purchased and planted into prepared ground at a spacing of 9 in. x 9 in. These will occupy 0.1 acres.

COSTS	Resources
Land Preparation	Land 0.1 acres
(rotovation, fertilising) £13.00	Labour 53 hours
Purchase of mother stock £750.00	
Planting 53 hours £ 40.00	

February. Mother Crop — Cuttings to be taken this month.

Crop 1 — 25,000 cuttings are taken from the mother plants. It is not necessary to treat these cuttings with hormone. The cuttings are immersed in a 10% solution of captan prior to being inserted in a moss peat medium in a warm bench, temperature 21°C. The glasshouse temperature is maintained at not less than 15°C. The cuttings are covered with a layer of 80 gauge polythene which gives them a warm, humid micro-climate. Distance apart 1½ in. The cuttings are inspected each week and ventilated for thirty minutes. Using this method about 80% of the cuttings will root.

COSTS	Resources
Bench preparation 35 hours £26.00	Frames Nil
Collection and insertion of cuttings, laying polythene (100 hours - 2000/man/day) £75.00	Glasshouse 450 sq. ft. bench space
Plastic £1.00	Land Nil
Heat £50.00	Labour 135 hours
Peat (25 bales) £ 25.00	
<u>£177.00</u>	

April/May. Mother Crop — The plants are top-dressed with fertilisers and pesticides are applied where necessary. Some handweeding may be required also.

COSTS	Resources
Herbicides £ 4.00	Land 0.1 acres
2.7 hours £ 2.00	Labour 13.4 hours
Fungicides £ 4.00	
2.7 hours £ 2.00	
Handweeding 5.3 hours £ 4.00	
Fertilisers £ 8.00	
2.7 hours £ 2.00	
<u>£ 26.00</u>	

Crop 1 — The 25,000 cuttings are lifted and those rooted after an appropriate hardening-off period are planted into cold frames. The frames may be cheap temporary structures. They will contain a 4 in. deep layer of moss peat. The plantlets are spaced at about 10 per sq. ft. After being watered-in, the plants should be covered by placing Dutch lights over the frames or by stretching 500 gauge white polythene over the frames, fixing it with battens. After a few days the first liquid feed should be applied and thereafter at fortnightly intervals until early September. At the end of May the Dutch lights/plastic should be removed.

COSTS		Resources	
Frame preparation		Land	0.1 acres
80 hours	£ 60.00	Labour	13.4 hours
Moss Peat (40 bales)	£ 40.00		
Lifting cuttings and planting into frames	120 hours		
	£ 90.00		
Watering and covering frames	10 hours		
	£ 8.00		
Watering when required and feeding each fortnight			
22 hours	<u>£ 16.00</u>		
	£ 214.00		

June/July. Mother Crop — These plants should be trimmed to produce suitable shoots for the following years cuttings. About half the plants will be excess to requirements and trimming will produce bushiness prior to sale in the autumn.

Spot treatment with herbicides and also handweeding will take place.

COSTS		Resources	
Herbicides	£ 2.00	Land	0.1 acres
1.3 hours	£ 1.00	Labour	8 hours
Fungicides	£ 2.00		
1.3 hours	£ 1.00		
Handweeding	5.3 hours		
	<u>£ 4.00</u>		
	£ 10.00		

Crop 1 — The plants remain in the frame throughout the summer. They are watered when necessary and feeding continues once fortnightly. A fungicide spray can be applied if necessary. Plants are lightly trimmed to produce bushiness.

COSTS		Resources	
Watering and feeding		Frames	2250 sq. ft.
22 hours	£ 16.00	Glasshouse	Nil
Fungicides	£ 2.00	Land	Nil
1.3 hours	£ 1.00	Labour	43 hours
Handweeding	5 hours		
	£ 3.00		
Trimming	15 hours		
	<u>£ 12.00</u>		
	£ 34.00		

August/September. Mother Crop — Spot treatments with herbicides are carried out, and handweeding where necessary.

COSTS		Resources	
Fungicides	£ 4.00	Land	0.1 acres
2.7 hours	£ 2.00	Labour	7.7 hours
Handweeding	5 hours		
	<u>£ 3.00</u>		
	£ 9.00		

Crop 1. — Watering, feeding, herbicide and handweeding operations continue. The plants should be trimmed for the second time, for stocky development.

COSTS		Resources	
Watering and feeding		Frames	2250 sq. ft.
22 hours	£16.00	Glasshouse	Nil
Fungicides	£2.00	Land	Nil
1.3 hours	£1.00	Labour	21.3 hours
Handweeding 5 hours	£3.00		
Trimming 15 hours	<u>£12.00</u>		
	£34.00		

October/November. Mother Crop — Due to increase in bulk, the mother plants will provide at least twice as many cuttings as one year ago. Therefore, half the original stock can be lifted and sold off for \$500.

COSTS		Resources	
Lifting, sorting, labelling, wrapping, packing 2500 plants		Land	0.1 acres
40 hours	£30.00	Labour	40 hours
Materials	<u>£18.00</u>		
	£48.00		

Crop 1 — Of the 20,000 plants originally planted into the frames, 90% will have survived. Of these, 75% will be sufficiently large to be sold off to retail nurseries, i.e. would be suitably sized for planting into their final quarters. Thus all young plants will be lifted from the frame, 13,500 will be sold and 4,500 planted into prepared ground for a further years growing-on.

COSTS		Resources	
a(Plants being lifted and sold (13,500)		Frames	2250 sq. ft. (until harvest)
Lifting, sorting, labelling, wrapping, packing plants 200 hours	£150.00	Glasshouse	Nil
Materials	£67.00	Land	0.1 acres
	<u>£217.00</u>	Labour	245 hours
b(Plants being lifted and replanted (4,500)			
Land preparation	£13.00		
Lifting and transplanting 4.500 plants 45 hours	<u>£34.00</u>		
	£47.00		
Total =	£264.00		

April/May. Mother Crop — The plants are top-dressed with fertilisers and pesticides are applied. Some handweeding may be necessary.

COSTS			Resources	
Herbicides		£ 4.00	Frames	Nil
2.7 hours		£ 2.00	Glasshouse	Nil
Fungicides		£ 4.00	Land	0.05 acres
2.7 hours		£ 2.00	Labour	13.4 hours
Handweeding	5.3 hours	£ 4.00		
Fertilizers		£ 8.00		
2.7 hours		<u>£ 2.00</u>		
		£ 26.00		

Crop 1 — Continue to care for growing-on crop. These plants should be lightly trimmed and should be treated with pesticides where necessary. Handweeding must also be done.

COSTS			Resources	
Trim once	6.7 hours	£ 5.00	Frames	Nil
Herbicides		£ 4.00	Glasshouse	Nil
2.7 hours		£ 2.00	Land	0.1 acres
Fungicides		£ 4.00	Labour	17.4 hours
2.7 hours		£ 2.00		
Handweeding	5.3 hours	<u>£ 4.00</u>		
		£ 21.00		

October/November. Mother Crop — The remaining 2,500 mother plants are reduced by 100, which are lifted and sold. The 1,500 plants now left in situ will be ample for providing 25,000 cuttings per annum.

COSTS			Resources	
Lifting, sorting, labelling, wrapping and packing 100 plants	15 hours	£ 11.00	Land	0.03 acres
Materials		<u>£ 6.00</u>	Labour	15 hours
		£ 17.00		

Crop 1 — The 4,500 planted into open ground from the frames one year ago, are now lifted and sold.

COSTS			Resources	
Lifting, sorting, labelling, wrapping and packing 4,500 plants	45 hours	£ 34.00	Land	Nil
Materials		<u>£ 16.00</u>	Labour	45 hours
		£ 50.00		

APPENDIX 2. CASH FLOW OF PRODUCTION SYSTEM OVER 3 YEARS

	YEAR 0						YEAR 1						YEAR 2					
	Oct./Nov.	Feb.	April/May	June/July	Aug./Sept.	Oct./Nov.	Feb.	April/May	June/July	Aug./Sept.	Oct./Nov.	Feb.	April/May	June/July	Aug./Sept.	Oct./Nov.		
Mother																		
Plants Costs	803		26	10	9	48	-	26	10	9	17	-	26	10	9	-		
Returns						500					200							
Crop 1 Costs		177	214	34	34	264	-	21	-	-	50	-	21	-	-	50		
Returns						1,350					540					540		
Crop 2 Costs						675	177	214	34	34	264	-	21	-	-	50		
Returns						-	-	-	-	-	1,350	-	-	-	-	540		
Crop 3 Costs											177	214	214	34	34	264		
Returns											-	-	-	-	-	1,350		
Cash Flow																		
Costs	803	177	240	44	43	312	177	261	44	43	331	177	261	44	43	314		
Returns						1,850					2,090					1,890		
Net Cash Flow	-803	-980	-1,120	-1,264	-1,309	+231	+54	-207	-251	-294	+1,465	+1,288	+1,029	983	940	2,516		

APPENDIX 3. RESOURCE REQUIREMENTS OF PRODUCTION SYSTEM OVER 3 YEARS

	YEAR 2															
	YEAR 1				YEAR 2											
	Oct./Nov.	Feb	April/May	June/July	Aug./Sept.	Oct./Nov	Feb	April/May	June/July	Aug./Sept	Oct./Nov	Feb.	April/May	June/July	Aug./Sept	Oct./Nov.
Mother Crop																
Land (acres)	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3
Labour (hours)	53	-	13	8	8	40	-	13	8	8	15	-	13	8	8	-
Crop 1																
Bench space (sq. ft.)		450	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frames (sq ft.)		-	2250	2250	2250	2250	-	-	-	-	-	-	-	-	-	-
Land (acres)	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Labour (hours)		135	232	43	21	245	-	17	-	-	45	-	17	-	-	45
Crop 2																
Bench space (sq ft.)							450	-	-	-	-	-	-	-	-	-
Frames (sq ft.)							-	2250	2250	2250	2250	-	-	-	-	-
Land (acres)							-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1
Labour (hours)							135	232	43	21	245	-	17	-	-	45
												450	-	-	-	-
												-	2250	2250	2250	2250
												-	-	-	-	0.1
												135	232	43	21	245
All Erica Crops																
Bench space		450	-	-	-	-	-	-	-	-	-	450	-	-	-	-
Frames		-	2250	2250	2250	2250	-	2250	2250	2250	2250	-	2250	2250	2250	2250
Land	0.1	0.1	0.1	0.1	0.1	0.2	0.15	0.15	0.15	0.15	0.15	0.25	0.13	0.13	0.13	0.13
Labour	53	135	245	51	29	285	135	262	51	29	305	135	262	51	29	290

plants twice during the growing season, as this results in more stocky growth.

By October/November the plants have reached a suitable size for sale (top growth 4-6 in. diameter). Cutting through the layers of peat between plants from the front of the frame to the back and along its length enables the plants to be removed with a substantial root block. At this point they can be:

- (1) planted directly into their permanent quarters,
- (2) stood out and loosely bedded by shaking peat through them.

(In this condition, whilst on display, they can be easily lifted and bagged at sale), or

- (3) containerised for standing out in garden centres.

Economics. The costs of production and cash flow for the system are shown in Appendices 1, 2, and 3. It is being assumed that the strike of rooted cuttings is 80 per cent. Therefore, although 25,000 cuttings are taken, the costs after propagation relate to the handling of 20,000 plants. The number eventually sold is 18,000. The costings take no account of management, capital investment or of rent, overheads, etc. It will be appreciated that no nursery will have exactly these costs and returns, but suitable adjustments can be made for individual circumstances.

SUMMARY

It can be seen that this system involves taking cuttings earlier than usual. The cuttings, although of hardwood, take only slightly longer to root than those propagated in July or August. Having plantlets available for planting into frames in April ensures maximum use of the growing season. The harvesting and sale of the majority of one-season-old plants in October means no over-wintering on the nursery, and releases resources (i.e. frames) for the autumn operations of planting up or of propagating other genera.

There is no potting carried out on these plants. The manner of their harvesting and the cohesiveness of the peat root-ball will enable the plant to pack and travel well and removes the painstaking operation of de-potting the subject, particularly if this task has to be done on a large scale.

No figure has been included for transport costs of the crop. This will vary between nurseries and according to the bulk of orders etc. In many cases the purchaser will pay for these, but when large numbers of plants are required for ground cover (and it is for this mass market the system is principally designed) then transport costs could be a consideration.

If the value of stock plants is not considered, a profit of approximately £200 (Appendix 2) is shown after year one, and of

£1465 in year two. The selling price of 10 to 12p, depending on the age of the plant, has been applied. At this price the purchase of stock for mass ground cover purposes would be attractive for municipal authorities and industrial site planting and may indeed rival the grassing of areas in view of the high maintenance costs of the latter.

THE BUDDING OF HAMAMELIS

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The successful budding of quality plants like *Hamamelis* is naturally more important to me as a Specialist Propagator, than the routine budding of standard nursery stock like roses and other main varieties. From a commercial aspect it should also be very important to all nursery owners.

Everyone knows the quotation that, "big oaks from little acorns grow." May I therefore suggest that "big profits from little *Hamamelis* could grow." By this method of production you can obtain a good saleable end product in the same time it takes to produce a rose. The main difference being that you can sell the *Hamamelis* at 6 to 10 times the price which you could obtain for the rose (currently *Hamamelis* sells for approximately £3.00 to £5.50 and the rose for around 50p).

I should emphasise that the budding itself is not a new way of producing these plants, as I understand it was done in the pre-war period. I will now endeavour to explain the whole operation with the aid of slides to illustrate the sequence of events.

First, we have to find the appropriate understock — in this case we use *Hamamelis virginiana*, the north American species. Although it was first introduced into this country around 1736, it is now virtually impossible to obtain here — or in Europe either, in the quantities required by the trade. We, therefore, have to rely on our American friends to produce the understock for us, in our case Gulf Stream Nursery, Inc. I should, however, mention here that in 1972 I did carry out experiments with de-budding onto *Distylium racemosum* an evergreen member of the *Hamamelidaceae*, as an alternative understock. Results were promising at first but subsequent scion growth was very slow. However I intend to continue experimenting to resolve the growth problem of this particular understock.

When the *H. virginiana* stocks arrive they are usually very thin and often do not improve as much as one would like in order to make the budding operation as easy as possible.