

HEATED BINS FOR ROOTING WOODY CUTTINGS

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Bins in the past have generally been associated with the propagation of fruit tree rootstocks. From simple beginnings in the early 1950's, when they were just utilized for storage, uses for them in rooting hardwood cuttings have developed, with the inclusion of soil warming procedures. Firstly, temperatures of 45° - 50°F were used, but more recently 70°F appears to be the optimum, especially for apple rootstocks.

Why use bins?

1. To increase the number of field liners over that which can be obtained from using more traditional methods such as hardwood cuttings in the open or in cold frames, e.g. *Cotoneaster x watereri*.
2. To propagate ornamental plants closely related to fruit tree rootstocks, e.g. *Prunus cerasifera* 'Nigra', *Malus* 'Profusion'.
3. To propagate ornamental plants not normally propagated by hardwood cuttings, e.g. *Crataegus* 'Paul's Scarlet', for use as a hedging plant. By simplifying, the cost of production can be reduced.

Siting. Ideally the bins should be placed on the north side of a building where the fluctuation of temperature is reduced to a minimum. Cooler air conditions on the north side help in reducing bud break. Some form of shelter over the bin helps in regulating the amount of water applied to the cuttings. In order to keep as even a temperature in the bin as possible a further insulating barrier of straw bales can be used round the outside of the bin.

Time of propagation. Following work carried out by Dr. Howard at East Malling Research Station (primarily with apple rootstocks), the 3rd week in February until early March appears to be the optimum time for taking the cuttings.

Source. The best cutting material is obtained from well-maintained hedges which have been pruned annually, thus giving good vegetative growth with high regenerative capacity.

Type of cutting. The basal portion of the one-year-old shoot makes the ideal cutting, prepared with secateurs to approximately 6-inches long, cut as closely to the previous season's wood as possible. Nodal cuttings are made if material from further up the stem is used.

Treatment. A quick-dip hormone of IBA. A selection from the following concentrations are used depending on the plant: 0.5%, 1.0%, 1.5%, 2.0%, 2.5%, 3.0%.

Examples (3 concentrations used per plant):

2%, 2.5%, 3% have been used on *Malus* 'Profusion' as these concentrations were nearest to those recommended for apples.

0.5%, 1%, 1.5% have been used on *Corylus avellana* 'aurea', as lower concentrations are recommended for cobnuts.

1%, 2%, 3%, have been used for plants where no information was available.

The basal 1/2-inch of the cuttings are dipped for 3 to 5 seconds and then allowed to dry. The cuttings are then packed into bundles of ten to minimise drying out in the centre of the bundle.

Temperature — soil warming. One each of three bins are set at 60°F, 70°F, and 80°F, 70°F being the generally recommended temperature. However some difficulty was experienced, due to the unreliability of the thermostats.

Insertion. The bundles of cuttings are buried to half their length in a peat/grit compost.

Watering. It is important not to allow the compost to dry out at the base of the cuttings. Watering should be reduced as soon as hardening off commences.

Summary: A considerable percentage of cuttings from a wide range of ornamental plants callused and rooted whilst in the bin. The subsequent check to these cuttings when removed and bedded out in a cold frame proved too much of a setback and generally, therefore, the final results were poor.

A close watch must be kept on the cuttings whilst in the bins, as callusing takes place rapidly at that period of the year, and a very close watch must be made on the moisture content of the compost at all times. Careful and gradual hardening-off is necessary in order to prepare the cuttings for lining or bedding out.

Bundling of the cuttings is not recommended as the cuttings callused into one another and as a result a large number decayed. We were, however, able to assess the plant's ability to callus.

We would have liked to have been more successful but we were sufficiently satisfied with the results to decide upon further trials in the coming season.

Plants used in our trials:

<i>Tilia x euchlora</i>	} Callus and roots
<i>Tilia platyphyllos</i> 'Rubra'	
<i>Tilia petiolaris</i>	
<i>Crataegus</i> 'Paul's Scarlet'	100% callus
<i>Crataegus arnoldiana</i>	Callus
<i>Corylus avellana</i> 'Aurea'	} Callus and roots
<i>Corylus avellana</i> 'Contorta'	
<i>Corylus maxima</i> 'Purpurea'	

<i>Prunus spinosa</i> 'Rosea'	}	Callus and roots
<i>Prunus cerasifera</i> 'Nigra'		
<i>Prunus serrulata</i> 'Sekiyama' (Kanzan')		
<i>Prunus serrulata</i> 'Shirofugen'		
<i>Prunus</i> 'Accolade'		
<i>Cotinus coggygria</i> (<i>Rhus cotinus</i>) 'Folius purpureis'	}	Callus and roots
<i>Cotinus coggygria</i> (<i>Rhus cotinus</i>) 'Rubrifolius'		
<i>Malus</i> 'Profusion'		Callus and roots
<i>Morus alba</i>	}	Callus
<i>Platanus x acerifolia</i>		
<i>Acer saccharinum</i> 'Pyramidale'		

Materials required for building a 'Garner' Bin, with approximate cost:

SIZE OF BIN — INTERNAL DIMENSIONS — 10 feet x 4 feet x 2 feet, 3 inches. (40 sq. ft. of bin capable of holding 10,000 to 12,000 cuttings)

	£	s	d
13 sq. yds. Thermalite blocks at 13s.8d. per sq. yd.	8	17	8
2 gallons bitumastic paint	2	0	0
1 thermostat and soil warming cable	9	16	3
1 cwt. cement and sand		10	0
40 sq. ft. wirenetting, 1/2 inch mesh		15	10
Peat/grit compost		15	0
5 asbestos sheets 6 ft. x 2 ft. 6 inches x 3 inches	6	18	0
80 ft. timber, 2 inches x 2 inches @ 6d. per ft.	2	0	0
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	£31.	12.	9.

Additional cost would include connection of the soil-warming cables to the mains supply.

Procedure:

Level site and cover with 2-inch layer of coarse gravel to give good drainage. Paint blocks required for base (42 blocks), allow to dry. Lay blocks for base close together; do not use cement, this allows for free drainage.

Build sides of bin using unpainted blocks; provide for damp course between bin and building and make sure that pointing is of a high standard. Keep blocks dry. When building is complete, paint all exposed surfaces with bitumastic paint.

Place 2 inches of grit in base of bin. Attach heating cable to piece of wire netting at correct spacing, this provides for easy removal of heating cables when clearing out the bin. Place 3 to 4 inches of compost (equal parts peat and 1/4-inch grit) over heating cables. Drill hole in side of bin for insertion of the thermostat. This should be placed so that it is at the

same level as the base of the hardwood cuttings. Build the shelter.

J. WELLS: Has anyone used pure sphagnum moss as a medium for these bins?

PETER HUTCHINSON: Not straight sphagnum, though sphagnum has been included in mixtures which have been used.

J. WELLS: I think that it would be worth trying pure sphagnum. We have found it to be successful with cuttings of such plants as *Thuja occidentalis*, taken in February and treated with hormones, then bundled and packed with their bases in sphagnum and kept in artificial light for six weeks in a cellar. These callus and begin to root and develop most successfully when placed in sand in frames, perhaps six weeks later. In this way we can extend the propagating season when conditions outside are severe. Sphagnum has also proved a very good medium for rooting *Chamaecyparis obtusa* 'Nana Gracilis'.

R. GARNER: With these problems we are, of course, concerned with sphagnum from the point of view of root development rather than root initiation.

B. H. HOWARD: The hardwood cutting bin was designed originally for long cuttings — 24 inches or so. Thus, when shorter cuttings are used and the compost reduced to about six inches there will understandably be greater fluctuations in temperature.

J. K. HULME: We have had some excellent rooting performances with these insulated bins though sometimes this has been followed by heavy losses subsequently. Our procedure has been to take cuttings from vigorous shoots when available, 7 to 12 inches long, depending on the species. The cuttings were prepared during the period from late February until the end of the third week of March. The cuttings were inserted in a 50/50 peat-sand mixture with a basal temperature of 70° to 73°F. Rooting generally took place quickly; in some cases good root formation occurred within 14 days. The cuttings were then lined out in nursery rows. The weather was colder than average in April, and May was excessively wet with a record rainfall for our site of over six inches.

Pterocarya fraxinifolia (*P. caucasica*) and *P. rehderiana* rooted well but 90% of the cuttings died in early summer. *Corylus avellana* rooted reasonably well but subsequently all died. The few *Alnus glutinosa* which rooted died. Only *Cornus alba*, 'Sibirica', and the common species of *Salix* and *Populus* continued to grow well; in all cases the species which did well can be rooted from hardwood cuttings without the aid of an insulated bin and high base temperatures. We shall be undertaking further trials in 1969-70.