

By becoming instructors in specific work skills and particularly in the new techniques of nursery stock propagation; and

By stimulating interest among fellow members in the benefits of instructional techniques training both in their own work and when passing on their skills to others, and the benefits to the business as a whole of training in work organisation (studying the method of the job, work planning, and work place lay-out).

Finally, "seeking and sharing" by continuously striving to ensure ever more credible and acceptable proficiency tests by working with the testing service as skills examiners and assisting in the development of standard work systems and techniques, and identifying and agreeing achievable standards of performance. To conclude in the vernacular of this city:

"Lang may ye seek and share".

## **THE PRODUCTION OF POT-GROWN LINERS IN FRANCE**

ANDRE BRIANT

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The story of a pot liner starts either with a seed, a cutting, or a graft; let us start it with cuttings.

The cutting material is collected from the stock plants each morning while it is still cool. Then it is kept in cold storage until the cuttings are made (never more than 2 days). All the cuttings are made with secateurs. The speed depends on the worker, of course, but mainly on the species, and it can vary from 200 to 500 per hour. Cuttings are dipped in hormones; we use IBA at concentrations between 1 and 5 parts per 1000.

Polythene tunnels are used for propagation. These are 8 metres wide and 30 metres long, double skinned with windows for ventilation. They are whitened for protection against the sun; we do not use any other shading system. The cuttings are stuck either in frames or in multipots. In both cases the compost used is a 50/50 mixture of peat and sand.

During the first three weeks humidity is kept as high as possible (around 97%) either with mist, with "Humid Air" — which is very close to a fog system — or with a low level tunnel. Then when roots appear, vents are gradually opened.

Cuttings made between June and October are potted the following spring. During this period they are protected from pests and diseases. Very few tunnels are heated during the winter.

Rooting success varies considerably according to the species and cultivar and can range from 20 to 100%. Overall we use about 75% of the cuttings we make.

The breakdown of labour costs to produce a rooted cutting is as follows:

Care of stock plant, 4%	Sticking cuttings, 16%
Collection of cuttings, 10	Care while rooting, 5
Preparing cuttings, 6	Lifting of cuttings, 3

(Two workers collect cutting material for 10 to 13 propagators)

**Potting.** As mentioned earlier, most of the softwood cuttings are potted between March and June. Most of the conifers are potted in September and October. We use a German Plan-tarex potting machine. We think it is the most efficient for bare-rooted cuttings but may be a little slow. Since we are moving towards the use of more multipots, we think that in the near future we will be able to use more sophisticated machinery and so speed up the process of potting.

We generally have six people working two machines. One supplies compost, two are potting, two are supplying pots and putting into trays, and one transports the pallet to the tunnels. The compost operator also carries trays from the rollers to the pallets. In total they pot about 18,000 plants in an 8-hour day, i.e. 3000 per person.

Polystyrene trays are used containing thirty-five 8 cm pots. The pots are spaced 10 cm apart to encourage a bushy plant habit. We find that if plants are placed too close they become too thin.

The compost is made up of 40% fine bark, 30% very fine bark, and 30% peat. An 8 to 9 month formulation of Osmocote is added at a rate of 3kg/m<sup>3</sup>. The bark, which is generally pine, is not composted but used immediately after delivery.

After potting, the young plants remain 3 to 4 weeks in tunnels until they have rooted around the pot then they are moved outside. The quality of the liner will depend on the aftercare we provide — irrigation, weeding, feeding, spraying, and trimming.

**Irrigation.** Water is given through oscillating spray lines which are portable. They are programmed to operate twice daily, from 6 a.m. in the morning and from 4 p.m. each evening. The amount applied, 3 to 5 mm each session, is decided by the foreman in charge. There is no hygrometer.

**Feeding.** Initially, the Osmocote in the compost provides adequate nutrition, but from early June liquid feeding is given via the irrigation system. We start from a concentrated solution which is injected in impulses into the pipes and diluted at 3 parts per 1000. The stock solution is adjusted according to the analysis of the water. The interesting thing about this system is that we can use any type of water; the pH is lowered with nitric acid. We generally cease feeding at the end of August to allow the plants to harden before winter.

**Weeding.** The weed problems are reduced by the use of our sterile compost. Herbicides we use are Simazine at ½ kg per hectare, Tenoran at 3½ kg per hectare, and Ronstar 2G (granular form) at 120 kg per hectare. In the last two years we have tried a new chemical called Boulherb, which is a mixture of lenacil and neburon. Used at a rate of 7 kg per hectare it lasts two months, and seems to be an efficient chemical. Most plants have tolerated it quite well up to now. An important aspect with herbicides is the method of application. To be effective it must be done very carefully. Overdosing causes accidents; too little avoids accidents but gives poor weed control. We spray with a boom which is the same width as the beds (3 m); the rate of application is controlled by the walking pace of the two operators at either side. The pressure is constant. For the last two years hand weeding has been reduced to 1 minute per 400 pots for the whole season.

**Spraying.** Pests and diseases are a constant problem so we spray all plants at 3-weekly intervals with a fungicide and insecticide. We use alternately Benlate, Aliette, Thiram, Captan, Decis, and Kilval.

In addition, plants are shaded, pruned and staked to make them saleable by the end of September.

## **THE PRODUCTION OF POT-GROWN LINERS IN DEVON**

**NIGEL JOHN TIMPSON**

*Hewton Trees and Shrubs*

*Bere Alston, Devon*

The nursery at Hewton was established 14 years ago. Since I took over in 1976 we have considerably expanded the facilities and production output. On the 3½ hectare nursery, 1½ hectares are used for production and 2 for stock planting. Most of our facilities are under polythene and we have space for ½ million plants under cover. Our current production is