

# PRODUCTION OF POT-GROWN LINERS USING THE "LEVINGTON TRAY"

DEREK C. ATTENBURROW

*Fisons Nurseries  
Levington, Ipswich*

**Abstract.** Traditional methods of growing-on rooted cuttings in 7 or 9 cm pots (pot grown liners) commonly consist of standing the pots in small open mesh trays or similar carriers. These methods are often expensive in handling costs, apart from the difficulty of applying water evenly and avoiding attacks by soil-borne diseases. The use of an isolated pallet handling system ("Levington Tray") eliminates these problems and thus produces a higher percentage of good standard pot-grown liners. Additionally the "Levington Tray", holding  $294 \times 9$  cm or  $442 \times 7$  cm pots allows for mechanical and lower handling costs from potting up the rooted cutting until it is returned for potting in the final container.

## INTRODUCTION

Standing down trays of pot-grown liners and later picking them up for transfer to the potting machine is a tedious, back-aching job for the operator and an expensive handling exercise for the employer. Additionally, it often proves difficult to water the small pots evenly which either results in the plants on the edges suffering from drought or, conversely, if the trays are stood on polythene, of some plants suffering from standing in puddles of water. In many instances, even if the pots are isolated from the ground with a layer of polythene, the area is walked on so extensively that it is difficult to ensure complete freedom from soil-borne diseases. Therefore, at Fisons Nurseries a system was looked for which would meet the following needs:

- Evenness and ease of watering or feeding.
- Cleanliness and isolation to give disease prevention.
- Easy, low cost handling to allow optimum use to be made of the various growing environments available on the nursery.
- Easy management that would allow for the use of less skilled people.

It is believed that the use of the "Levington Tray" meets the above objectives and offers the opportunity to standardise and improve the production methods of pot grown liners.

To date the above programme has kept the propagation house free of algae and any obvious signs of the usual diseases expected, particularly *Rhizoctonia*, *Fusarium*, *Botrytis* or *Phytophthora*.

**Pot-Grown Liner Production.** Pot-grown liners (liners) on the nursery are produced in two basic sizes of pots, these being 9 cm for conifers and 7 cm for mixed shrubs. Fisons Container Compost is used throughout with the Ficote addition being used for early/mid-summer potting.

At first the liners were placed in Empot Trays which, in turn, were stood on the floor of the house which had previously been covered with a porous woven polypropylene fabric (Mypex), the pots being watered by an overhead sprayline. This produced reasonable results and avoided puddling, but it did not provide sufficient isolation from the soil.

The next step was to place the liners, still in Empot trays, on polythene covered pallets, again with watering via an overhead spray line. This provided isolation, overcame puddling, but did not overcome watering problems or excessive handling — Empot trays not travelling down the roller conveyors in use on the nursery. Therefore, it was decided to see if traditional methods could be dispensed with. The result of this thinking is the production of a palletised handling system, or the “Levington Tray”.

## METHODS

**Propagation.** Growing clean plants begins at the cutting stage, and every effort is made right from the start to produce clean, healthy, and vigorous plants. Cutting material is taken from disease-free plants and all cutting preparation is carried out under clean conditions.

Propagation is on sub-heated mist sand beds, each bed of a size which avoids the need to step onto them. Propagation trays are plastic with a mesh base. The compost used is peat-based with perlite or grit added to ensure that the drainage characteristics are adequate to cope with the amounts of water applied via the mist nozzles. Disease prevention during the propagation stage is as follows:

— the mist beds and cutting trays between crops are drenched with a chlorine solution using Fi-Tab R/D tablets (sodium dichloroisocynurate) at 4 tablets per 100 litres to give 100 mg/l chlorine concentration.

— the mist beds are not walked on.

— the cutting material, on arrival from the field, is washed in Captan before preparation and then inserted into the compost which has received a prior watering with Filex (propamocarb hydrochloride). Thereafter, the cuttings are sprayed at two-week intervals with either Rovral (iprodione) or Benlate (benomyl).

**The 'Levington Tray'.** The first step in the development was to establish what was required from the system. The requirements considered of priority were: isolation from soil contamination including that from shoes; ease of sterilisation between crops; simple and even water application; movement of an economic load; fitting the standard trollies in use on the nursery; be able to pass through all tunnel or shade house doors; be comparable in cost with plastic trays holding a similar amount of plants; and finally, if necessary, be light enough to be lifted manually.

Timber was chosen for the construction due to the cost of approximately £15 per tray using treated wood, plus the fact that timber allows the trays to be repaired on site. The "trays" are constructed using  $4 \times 5$  sq. cm longitudinal bearers fastened to  $3 \times (7.5 \text{ cm} \times 4.4 \text{ cm})$  cross supports. An edge board 12.5 cm by 1.8 cm is then fastened all round to give an effective pot standing depth of 6.25 cm. The "floor" of the "tray" is 1.25 cm plywood. The whole of the interior is then lined with polythene on which is placed a capillary mat.

The "trays" will hold  $442 \times 7$  cm or  $294 \times 9$  cm square pots. The weight of an empty tray is approximately 42 kg, or 100 kg if filled with pots using a peat compost.

Irrigation of the trays is via a Cameron trickle system. A plastic elbow joint is placed in one end of the tray to provide drainage in case of excessive rainfall, or to control the level of water within the tray. In practice it is beneficial to place the trays so as to provide a slight fall towards the drainage point and away from the trickle nozzles.

The disease prevention programme started in the propagation stage is continued throughout the pot-grown liner stage as follows:

— Complete isolation for surrounding soil, which includes the absence of any "dirty boots".

— New pots used for each crop.

— Between crops, new polythene is used to line the trays, and capillary mats are either new or sterilised.

— Alliette (ethyl phosphate) is applied to all the pot-grown liners at potting, six weeks later, and immediately prior to potting in the final container.

— The basic pest control programme consists of Basudin 5G Granules (diazinon) sprinkled on the capillary mat against Sciarid fly, and the incorporation of Aldrin or a drench by Aldrex as a precaution against vine weevil or leather jackets.

## CONCLUSIONS

“Levington Trays” have been used for two years for growing a wide range of shrub and conifer species. The use of the “trays” is meeting all the objectives aimed for, i.e.

— easy, low cost handling, which means that short periods under cover after potting to get the roots moving and before standing outside become feasible;

— even watering to each pot becomes a reality, removing losses due to localised drought;

— complete isolation and protection from the soil and soil-borne diseases; and

— good management is possible with less skilled staff.

These all combine to assist in the production of a good, healthy, vigorous standard product by standardised methods at an economic cost.

## POT-GROWN LINER PRODUCTION IN DENMARK

ANTON THOMSEN

*Thomsens Plantskole*

*Skalborg, pr Aalborg, Denmark*

If I look back to 16 years ago most conifer production in Denmark consisted of striking cuttings in frames where they remained for two years, followed by two years set out in well prepared beds before being planted out in the field. Today, approximately 80% of the conifer liners are produced by four nurseries, on a similar but not identical method to the one we use, which I will describe.

In 1967 we built two aluminum greenhouses 20 × 61 m to rationalise production of liners. Half of one house was equipped with mist propagation, the remainder of the glass-house area was used for winter potting of rooted cuttings. This was to produce better liners and make good use of labour in the winter. Today we have four greenhouses of this size, using one for propagation and the others for potted liners.

Our present production of liners is outlined. From July to October *Juniperus*, *Chamaecyparis*, some *Thuja* and *Berberis*, *Euonymus fortunei*, *Skimmia*, and *Ilex* cuttings are struck in flats, using a medium of peat and styrofoam balls. From the end of January until mid-March they are potted in rigid plastic pots, using a potting machine. From the end of May to mid-June the liners are moved from the greenhouse to outdoor frames.