

Once the plant is established it will then grow away with vigour, if supplied with water and warmth. By carrying out the procedures described in this paper, a profitably saleable plant can be produced, with minimum losses, within 10 months.

Discussion

John Gaggini inquired as to the effects of pinching *Garrya* plants when growth was still soft rather than awaiting the end of a growth flush. Arthur Carter indicated that only about 50% of the shoots broke, the remainder produced only a continuing leader shoot. Bernard Van Elk explained that they had a similar problem with hibiscus in Boskoop.

PRELIMINARY TRIALS WITH PULVERISED PINE BARK AS A ROOTING MEDIUM

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INTRODUCTION

In September, 1970, Mr. J. R. Aaron of the Forestry Commission visited Wisley and asked if we could use pulverised pine bark experimentally for various purposes around the garden and offered a generous consignment of the material to enable us to assess its merits. Some of the uses were fairly obvious and these included mulching, plunging material and inclusion in growing composts for orchids and bromeliads; its use as a rooting medium was less obvious although it has the physical properties needed in cutting composts. It is capable of retaining moisture, although absorbing somewhat less than peat, and it drains off any surplus water rapidly, thus remaining well aerated.

Pine bark is available in large quantities from felled timber and not many years ago was regarded as a waste product not easily disposed of; now, in its pulverised state, it is proving a very useful commodity in horticulture. It lacks any readily available plant food and can create nitrogen deficiency if mixed in the raw state with soil. This food shortage is not an important factor whilst cuttings are rooting and can be corrected by applications of liquid feed or compensated for by foliar feeding when this is necessary. Although the pH of the material is not specifically stated in Forestry Commission literature, a sample tested at Wisley gave a reading of pH 5.5, nicely on the acid side and very suitable

for ericaceous plants. Perhaps it should be pointed out at this juncture that bark ammoniated by the forestry commission in early experiments jumped to what is for many plants an unacceptably alkaline reading quoted by Aaron (1) as about pH 8.0.

MATERIALS AND METHODS

The pine bark used in our initial trial had been stacked and weathered for a year. Experience gained since then indicates that there is no inhibition of rooting or other ill effect when new material is used. No sand, grit or other drainage material was added and on a subsequent occasion when 1 part polyolefin granules were added to 3 parts of pulverised pine bark, no significant advantage was noticed.

Cuttings were taken over the period October, November and December, 1972, were lined out in the bark in plastic seed trays and then placed under intermittent mist with bottom heat thermostatically controlled at 75°F in the bench sand bed. Air temperature in the glasshouse was maintained within the range 50-55°F. Woody subjects were wounded with a ½" slice wound and dipped in I.B.A. powder at a strength of 0.5%.

A wide range of plants were used and these included rhododendrons, camellias, ericas, cassiopes, X *Cupressocyparis leylandii* and *Ilex aquifolium* 'Golden King'. Sundry glasshouse plants needed in our routine replacement programme were also rooted in the pine bark.

RESULTS

Results in most instances were extremely good. Early inspections showed that most of the cuttings from woody plants were forming roots in about four weeks, softer cuttings naturally rooted much more rapidly.

Twenty-two species or hybrids of rhododendrons were inserted and these gave us between 90% and 100% potted with extremely good root systems within 8 weeks of insertion, with the exception of *Rhododendron* 'Emerald Isle' (50%), *R* 'Jalisco' (60%), and *R oreotrephes* (30%). *R. oreotrephes* is inclined to be partly deciduous and may have given better results if taken earlier. The poor percentage of *R* 'Emerald Isle' can probably be accounted for by its constitution, its health has never matched the beauty of its bloom.

The worst response was from X *Cupressocyparis leylandii*, surplus material of clone 11 received for the I.P.P.S. experiment and given the treatments prescribed for the experiment, except that pine bark rooting medium was used. At the same time of assessment none was rooted satisfactorily although they had

formed callus and were still alive. A repeat trial under the same conditions in 1973, although giving better results, only produced 30% cuttings satisfactorily rooted by the time they were lifted, compared with 69% from the sand and peat mix.

Ilex 'Golden King' gave 80% rooted for potting in 6 weeks, *Cupressus* 'Cost of Living' 100%. As anticipated the heathers, cassiopes, hebes, euonymus and sundry other hardy plants rooted rapidly and with virtually no losses, as did all of the glasshouse plants.

None of the rooted cuttings showed any inhibition of growth by the move from bark to our normal potting composts; the particles of bark adhered well to the roots and the young plants quickly grew away.

LITERATURE CITED

1. Aaron, J. R. 1970. The utilisation of bark. *Forestry Commission Research and Development Paper No. 32.*

Discussion

In general it can be said that whilst most rooting percentages were no better or worse than one would expect if using an orthodox peat and sand mixture, rooting commenced earlier than anticipated and most of the root systems were particularly good. The behaviour of X *Cupressocyparis leylandii* was somewhat inexplicable and I can only assume that the poor result was due to the lightness and extreme aeration of the bark.

No overall system of controls was used as there was no intention of carrying out a formal experiment. We were asked to try the bark as a rooting medium; we did and found it, in most respects, a good medium. The trial was carried out whilst handling our normal throughput of plants. Perhaps those better placed to do so will explore in depth.

In answer to various questions the following information was given

The pulverised bark was of ¼"-3/8" grade and was very consistent; it had been stacked in the open in approximately 10 ton lots and had received no additives. Hardwood bark had not been used. About 10 cuttings of some 22 different plants had been used in the observations.