

there is time for a second pruning in December without losing the beauty of the summer and autumn blooms.

Double node cuttings 30 to 35 mm long are taken from the last 1½ m of the previous season's growth or from new growth, not younger than 2 months. Variable, but mostly poor results are obtained with other wood.

To prevent damage to cuttings when planting into gravel use a stick with a central groove and plant cuttings 6 cm apart. After 3 to 5 weeks callused and rooted cuttings will be producing new trailers and can be planted out. Between 95 and 100% strike is obtained with the recommended wood (Table 1).

**Table 1.** Effect of cutting wood type on hydroculture propagation of *Ipomea horsfalliae*.

Time	Age of Wood	Number of cuttings		
		Started	Rooted	Planted out
October, 1982	Old wood; last year's growth	96	94	94
October, 1982	New growth (2 months)	104	104	104
October, 1982	Hardwood (No leaf)	48	2	2
October, 1982	Tips and other	56	20	18
December, 1982	New growth (2 months)	56	53	53

Plantlets are carefully removed from the gravel using a grooved stick and then potted into a good open mix, such as pine bark and sand, and then staked. They are kept in the glasshouse for 5 days to avoid shock and then shifted to 50% shade. Root growth is rapid during the first weeks and plant growth is normal.

## USE OF HERBICIDES IN TUBE-STOCK PRODUCTION

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There are a number of points that should be checked before using any herbicide on your tube stock.

1. Read any available literature on the herbicide, noting such things as frequency of application.

2. Pay particular attention to the climatic factors in the data.

3. Pay particular attention to the soil mix being used in obtaining the data.

4. Frequency of irrigation needs to be noted also.

5. Having done all that, see if the literature deals with any of the plants you are growing.

6. Before embarking on large scale treatments do small trials with all plants and sizes then assess the results.

Weed control in a wide range of tube stock can be accomplished if raised benches are used, with windbreaks around holding areas, and with the headland and underbench areas sprayed with Tryquat or Roundup.

Tryquat is non-residual, very toxic to the operator, but very effective on any germinated weed seedlings, causing death within 48 hours except to such weeds as couch, paspalum, and Cyperus which will regrow. Roundup can be used on those not killed by Tryquat but up to 3 weeks are required to achieve a kill. In our climate we use a wetting agent and some dissolved urea in the tank to make the Roundup more effective. If used according to the manufacturer's directions a most unsatisfactory kill is generally obtained under our conditions.

It is important to use clean soil, clean containers, and clean water, i.e. free from weed seeds.

Regulating the amount of water and liquid fertilizer applied discourages the growth of liverwort and/or mosses. The time that tubes are held before repotting should be minimised.

Using such an approach gives tubes with none or very few weeds. We keep them that way by spraying with Yield and/or Tenoran. Both these products have advantages and disadvantages. Yield is applied as a spray every 3 months over any plants that do not have a set growing period. Do not spray on anything that is deciduous or semi-deciduous or bulbous or on evergreens such as *Hardenbergia*, *Lantana*, *Cyathea*, *Abelia*, *Rosa* or *Tamarix*. It is recommended on eucalypts, *Grevillea*, *Callistemon*, *Boronia*, *Banksia*, and assorted palms.

Yield can be used as a growth retardant on such plants as willows, roses, weigelas, hydrangeas, and flowering quince. It generally does not kill plants but just retards growth for up to 6 months when they again commence normal growth. On our soil mixes we use 1 kg of 36% active ingredient per hectare or about 1,800 ml of 26% strength in a 200 litre tank. One needs to do his own calculations because of pressure variations in pumping equipment and different nozzle sizes.

On non-susceptible plants up to 3 kg per hectare can be used but this is unnecessary. All paths and below bench areas and plants are sprayed by a hand-held wand or boom spray. Watering in summer is at least twice a day and under these conditions weed control can be had for 12 weeks.

Any of the problem weeds commonly found in Western Australian nurseries, e.g. flick weeds, oxalis, milk weed, pampas grass, summer grass, crab grass, and thistles are being controlled by regular applications of Yield. Presently our soil mix consists of  $\frac{1}{3}$  silica +  $\frac{2}{3}$  sawdust-woodwaste (all hardwood). Any weeds that we happen to miss can be sprayed with Tenoran, particularly flick weed, even up to the seedling stage. Care needs to be taken not to spray Tenoran on groundcovers, asparagus ferns, or grevillias.

Yield can be applied all year round but we do not spray in temperatures over 30°C and the automatic water follows along when scheduled. Tenoran, on the other hand, is allowed to dry on the weeds and plants overnight for best results.

We have conducted trials with Goal, Dacthal, Devrinol, Casoran, Ronstar liquid, and Simazine and are presently doing some trials with Ronstar granuals which look very promising.

## **PLANT PROPAGATION IN THE MIDDLE EAST**

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The growing of palms for food production is one of the most ancient forms of plant propagation. The arid countries of the Middle East such as Saudi Arabia and surrounding nations have propagated palms since time immemorial. The oasis and wadis surrounding sweet water wells and the areas under the palm plantations are used for other forms of plant propagation for many vegetables and fodder crops. Lucerne (alfalfa) is the main green crop grown for their animals.

Each palm tree forms an orchard square, approximately 8 metres by 8 metres, a small mound surrounds each square and holds the water for both palms and green crops. This water is drained off to the next square and the process of irrigation continues.

Over the last 10 to 15 years a great demand has developed for propagation resources which do not exist as we know them.

Seed production of eucalyptus, casuarina, and other Australian native plants is now well established. Other trees and shrubs are also produced from seed under these palm trees.