SINGLE NODE VS. DOUBLE NODE CUTTINGS FOR THE PROPAGATION OF *PYROSTEGIA VENUSTA, HARDENBERGIA VIOLACEA* 'HAPPY WANDERER' AND *CLYTOSTOMA CALLISTEGIOIDES*

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Training and experience show that there is greater root development around a node than there is along the stem so it is a general practice to propagate cuttings with a minimum of two nodes, one below, in the medium, the other above it.

This is a practice that research and long usage has proven effective. However, there are disadvantages with some species. These are:

a. when the internodal length is exceptionally long, the cuttings are difficult to handle and become unwieldy when placed in a community tray.

b. if the plant material is badly tangled (as often happens with climbers) it is difficult and time consuming to extract "two node" cutting material. There is also a risk of plant tissue damage.

c. There are obvious arithmetical disadvantages if each cutting has to have two nodes should there be a shortage of plant material.

Whilst over time there must have been research into root production on single-node (leaf-bud) cuttings, a brief search of the literature revealed little information and, in particular, nothing on the three species mentioned in this paper.

It is not easy for a commercial grower to conduct rigorous plant trials (and record the results), while still operating on an economic basis. It was decided therefore that initial trials would only be brief, unreplicated, and limited in size.

The objective was simply to assess whether there was a satisfactory strike rate from cuttings with only one node. Three kinds of plants were selected:

a. *Pyrostegia venusta* [syn. *P. ignea*] (orange trumpet creeper). An evergreen, vigorous climber with brilliant scarlet-orange flowers in great profusion. Grows well, but does not flower well, if at all, in southern Victoria.

b. *Clytostoma callistegioides (Bignonia lindleyi' Tecoma lindleyana).* The Argentine trumpet-vine. An evergreen, large climber bearing in spring and summer, large trumpet flowers of lilac, marked with yellow and purple.

c. *Hardenbergia violacea* 'Happy Wanderer' (purple coral pea). Evergreen, this cultivar is a vigorous climber with masses of purple pea shaped flowers from July to October; other colours are pink and white.

Each trial consisted simply of a control and the treatment. The nursery's standard propagating techniques were used.

The propagation medium consisted of 85% sharp sand and 15% peat moss. Propagating trays (350 mm × 300 mm × 50 mm) were filled to the top with the medium. Pre-watered it was left to drain before the cuttings were inserted in rows at approximately 25 mm centres, giving 150 to 200 cuttings per tray. The cuttings were dipped in a 1% Benlate solution before sticking.

The two-node cuttings averaged 70 to 100 mm long and the tips were removed if they were unduly soft. The basal cut was made immediately below the node and was horizontal, (there may be more than two nodes if the internodal length was short). The bottom leaves were removed and the remaining leaves were trimmed if too large. The top cut, if any, was made immediately above a node.

With the single node cuttings, the top cut was made just above a node and the bottom cut (horizontal) approximately 50 to 70 mm below the same node.

All the trial cuttings were treated with an IBA powder, which was a commercial 12,000 ppm IBA reduced to required strength with talc on a daily basis depending on the specific needs. The propagation trays of cuttings were placed on sand bottom-heated benches in a fibre glasshouse with solid walls. The bed temperature was set at 21°C and the mist frequency was adjusted daily to suit the ambient conditions. Fungicides were applied as required.

Rooting results are given in Table 1.

Table 1. Rooting obtained with either single or two node cuttings of *Pyrostegia venusta*, *Hardenbergia violaceae* 'Happy Wanderer', and *Clytostoma callistegioides*.

Trial 1. Pyrostegia venusta

Propagated	Number of Cuttings	Type	IBA	Tubed	Number Struck	% rooted	Comment
27-11-87	111	Single Node	4	11-1-88	48	43	Cuttings from 2 yr old 1.2 m high plant in 20 cm container in igloo.
27-11-87	85	2 Node	4	11-1-88	65	76	Cuttings from 5 month tubes held in igloo.
27-11-87	85	Single Node	4	22-2-88	29	34	Cuttings from 5 month tubes held in igloo.

Trial 2. Hardenbergia violacea 'Happy Wanderer'.

Propagated	Number of Cuttings	Type	IBA	Tubed	Number Struck	% rooted	Comment
26-2-88	520	2 Node	5	8-4-88	357	68.8	150 cuttings (28.7%) restruck 13 cuttings (2.5%) dead.
26-2-88	1205	Single Node	5	8-4-88	612	50.7	150 cuttings (12.4%) restruck 248 cuttings (20.7%) dead.

Trial 3. Clytostoma callistegioides

Propagated	Number *of* Cuttings	Type	IBA	Tubed	Number Struck	% rooted	Comment
16-2-88	90	2 Node	4	30-3-88	84	93	Dead 6
16-2-88	165	Single	4	30-3-88	160	97	Restruck 5

DISCUSSION

As with most trials the results raised more questions than answers. As always one would have wished for more replications, larger numbers and the elimination of more variables.

However from the results it would appear that single node cuttings were justified for *C. callistegioides;* of doubtful value for *H. violacea* 'Happy Wanderer'; and not justified for *P. venusta*.

Further research is required however, and until then there must be reservations about the results. In this trial the samples were small and the results were not statistically analyzed; no allowance was made for seasonal variation in cutting wood. For example, whilst poor results were obtained with *P. venusta* using young or juvenile wood, we normally propagate this species from older hardwood and, as a general rule, achieve higher strike rates.

The very high death rate of the *H. violacea* single node cuttings looks most discouraging. However, this was semi-hard mid-season wood (February). It may be that single node cuttings might strike more readily in late spring (November–December). Alternatively the incorrect hormone rooting powder may have been selected. It may also be that cuttings propagated in sub-tropical climates (south-east Queensland) will provide a higher number of adventitious roots.

The good results for *C. callistegioides* single node cuttings may not be replicated with cuttings taken at other times or at other stages of plant growth. Nonetheless we do know that cuttings propagated

in January from lush container-grown material will strike readily whether cuttings have one or two nodes.

Not enough attention was paid in this trial to where the roots developed and in what densities along the cutting. It is known that two node cuttings of *H. violacea* produced roots from the basal node only, but the root development patterns of the single node cuttings were not closely observed.

It is not known how the struck cuttings will develop as they grow in the tubes, and whether the effect of different root production patterns will affect subsequent growth patterns.

Finally, in conjunction with the results and these reservations any economic benefits must also be evaluated. There are many climbers where the cutting material is so tangled that a degree of loss is acceptable if single node cuttings permit faster production rates, albeit with a correspondingly higher non-strike rate. Offset, of course, by the extra cost of labour, nutrients, space and time. It becomes a bottom line decision.

KANGAROO PAW BREEDING—THE "BUSH GEMS" CULTIVARS

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I would like to dedicate this paper to my late friend and mentor, Mervyn Turner, who during the last decade of his life dedicated himself almost entirely to breeding kangaroo paws (*Anigozanthos* spp.). His breeding program gave rise to the "Bush Gems" range of hybrid cultivars. Merv had a vision for breeding not just kangaroo paws, but also a whole range of other Australian native plants, such as Christmas bells (*Blandfordia* spp.), pimeleas (*Pimelea* spp.) and numerous others.

As a tribute to Merv Turner I would like to review the results to date of the "Bush Gems" breeding program. I hope that the experience gained with kangaroo paws will be of assistance to those interested in the genetic improvement of Australian plants.

The genus *Anigozanthos* contains species with a spectacular range of colours and flower forms and often within a species a range of colour forms exists. The large range of colours and colour combinations available to the breeder has only been partially exploited to date.

The greatest limitation to the horticultural development of