The Propagation of Native Plants

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INTRODUCTION

In giving this paper I feel that I may provide more questions than answers. In spite of its all-embracing title I intend to deal with just one or two aspects of the propagation of native plants. I must say that, the more I travel around the country and talk with various people, the more I discover that there is a wealth of knowledge out there. The main problem with it is that so much of it is only in a particular person's head and is not recorded for others to use.

Some of this is because of professional jealousy and that phrase which is becoming so common these days — "the information is commercially sensitive". Quite often I believe it is because the person concerned has just not thought about recording it, or does not feel that anybody would be interested. I well remember the very generous help I was given when I was in the process of gathering information for my book *The Propagation of New Zealand Native Plants*. Four people, in particular, provided me with a great deal of information. Had they not done so, much of their information might never have been recorded and we would have all been the poorer for it.

PROPAGATION HISTORY

Before continuing I am going to give a brief historical overview of the propagation of native plants in New Zealand. As might be expected, the first people to attempt to propagate some of the native plants of this country were the early Polynesian immigrants, the Maori. From their tropical homeland they brought with them some of their staple plants such as the kumara (sweet potato), yam, taro (*Colocasia esculenta*), aute (*Broussonetia papyrifera), Cordyline terminalis*, and no doubt the coconut and banana, as well as possibly one or two other species. They must have been quite disheartened to discover that most of these plants could only be grown successfully in the warmest and most favourable areas of New Zealand and that some, such as the coconut and banana, could not be grown at all.

Naturally, the Maoris then turned their attention to suitable native plants, but their new homeland was not as well endowed with economic plants as the other Pacific islands. One plant that they found almost indispensable was the flax, *Phormium tenax*. Over a period of several hundred years they had recognised and named over 50 different kinds of flax according to their uses, strength of fibre, and so on. They also propagated these different kinds of flax so that they had ready access to ample supplies of them.

Another plant, which was of considerable importance, being prized for its nuts or kernals, was *Corynocarpus laevigatus* or karaka, which was second only to the kumara (sweet potato) in economic importance. The Maoris discovered that it was easily propagated by seed and they used to plant groves of it adjacent to their villages or at seasonal camping places, where it would be useful to them. They also cultivated the para or king fern (*Marattia fraxinea* [syn. *M. salicina*]) for its starchy rootstocks. Apart from perhaps one or two kinds of variegated flax, about the only plant they are known to have cultivated for ornament was the kaka beak, *Clianthus puniceus*.

The establishment of towns, following the arrival of the first European colonists, saw the beginning of the nursery industry in New Zealand. The first ones appear to have been established in the early 1850s and 1860s. It is interesting to note that as early as 1865, overseas-produced cultivars of *Hebe* were being imported into New Zealand, from England. *Hebe* ×*andersonii* 'Andersonii' appears to have been the first, but *H.* ×*franciscana* 'Lobelioides' and some others followed from the 1870s onwards.

Apart from the odd specialist nursery, few different species and varieties appear to have been propagated. The 1899-90 catalogue of the well known Nairn's Nursery in Christchurch revealed that no more than 12 different kinds of native plants were being propagated. No doubt some other nurseries may have grown more but the number appears not to have significantly increased until late in the 1900s. Back in those days some nurseries adopted the practice of obtaining seedlings from bush areas and then growing them on for sale — hardly plant propagation. This practice continued until quite recent times. Even as late as 1948, Duncan and Davies, and no doubt other nurseries, had an arrangement with people, living in bush areas, to supply them with seedlings of trees such as rimu (*Dacrydium cupressinum*) and totara (*Podocarpus totara*) which they then grew on.

Nowadays, large quantities of native plants are propagated either vegetatively or sexually, depending on the kind of nursery, and few would resort to growing seedlings collected from the wild. Obviously there are exceptions to this where seedlings and sporeling ferns are gathered from pine plantations prior to clear felling taking place. With nurseries that specialise in growing re-vegetation lines most plants are propagated from seed, whereas those which produce mainly ornamentals would produce most of their plants by vegetative means.

From here on, I wish to discuss one or two aspects of native plant propagation which interest me.

ASTELIAS

In 1994 I became interested in the propagation of *Astelia*. They are plants for which I have a great deal of regard, because of their horticultural and landscape possibilities, and I also consider that they have for too long been overshadowed by the plethora of variegated flaxes with which we have been bombarded for the last 20 odd years. Anyway, a chance remark by a nurseryman friend about the effect of frost on his plants of *A. chathamica* set me thinking. He commented that when their young plants of *Astelia* were frosted in the winter they stooled from the base and they were then able to easily divide-off young plants.

Having had my own plants of *A. chathamica* killed or almost completely killed by frost I decided that this was a very chancy way of propagation and just too risky. Therefore, I mulled over the problem for a while and eventually came to the conclusion that it should be possible to solve the problem by artificial means. If the apical bud could be mechanically destroyed so as to induce the plant to branch from the basal plate then there would be a more certain method of propagation, particularly for cultivars, which cannot be propagated from seed.

At the same time I was also aware of Kevin Gdanitz, of Camside Nursery, who had been struggling for some years to build up stocks of his *A. nervosa* 'Alpine Ruby'. I really think that he had a cultural problem with his container growing, because I had grown it in the open ground for a number of years and had had absolutely no problem with propagating it.

Accordingly, I then began to experiment with some seedling plants of *A. fragrans*, which I happened to have. The first thing was to slice down through the apical part of one of the seedlings in order to examine its structure and find out exactly where the apical bud was situated. Having determined that I then commenced to decapitate one or two plants so as to find out whether my idea would work.

In common with some similar plants, *Astelia* has a rather slow rate of branching so that propagation by division may be equally slow. This is caused by apical dominance, which is responsible for its relatively slow rate of branching. Mechanically induced branching, if successful, would obviously have a great deal to commend it. I discovered that the leaves all arise from a well defined basal plate at the crown of the rootstock, from which both the leaves and roots are produced. In order to gain easy access to the apical bud it is necessary to cut off all leaves quite close to it. This basal plate has a relatively flat, dome-shaped profile so that when cutting off the outer leaves care must be taken not to actually cut into the basal plate, or to cut off its top portion. Cutting off too much of the basal plate limits the number of new shoots which will be able to appear from it.

Once the apical bud has been located it is then carefully excised so as not to damage any more of the surrounding tissue than is necessary. This operation is best carried out during late winter or early spring, just as growth is about to commence. After about 4 to 6 weeks the first new shoots should appear, and then later in the season, as soon as they are large enough, it is possible to divide off the new plants. From then on, the plant should keep on producing a multitude of new growths, from which it is possible to repeatedly divide off new plants.

Some of you will probably be saying what is the point of all this when it should be possible to send material to a plant propagation laboratory and have new plants produced by tissue culture. Well, the simple answer is that this method of propagation can be done by anybody because special facilities are not required. You are not bound by the minimum quantities required by plant propagation laboratories, you can produce to your own requirements, be they 50 or 500 plants, and it is far less costly. The only possible disadvantage that I feel this method of propagation may have is that the new plants so propagated appear to have a tendency for the continuing proliferation of their growth buds.

A plant of a seedling-raised *Astelia* initially produces a plant with apical dominance so that the central bud makes strong growth before any branching occurs. With plants propagated by the mechanical branching method they very quickly commence branching and do not appear to have the one central bud that would normally assume apical dominance. The next step is to see what happens when these plants are planted out in garden conditions. Do they begin to behave in a more normal manner or will they forever continue to produce a proliferation of leaf buds?

COPROSMAS

The other aspect of native plant propagation that I am going to mention is that of root cuttings. For some time I have noticed that certain coprosma produce adventitious growths or suckers from their roots. These growths arise at varying distances from the plant and to me indicate that there is the possibility of propagating some species and cultivars by means of root cuttings. Most coprosma are quite easily propagated from stem cuttings so that propagating them from root cuttings may not have any practical application; however, purely out of interest, I intend to follow up

on this in order to see where it takes me. Very few native plants appear to have this capability and I feel that it will be interesting to explore it.

The main species, which sucker from their roots, are *C. acerosa* [syn. *C. brunnea*] and *C. rugosa*, plus any cultivars which have either of these species in their parentage. In particular, 'Hawera' and 'Lawrie Metcalf' produce suckers from their roots, the latter having *C. rugosa* as one parent.'Hawera' is possibly just a cultivar of *C. acerosa* and not a hybrid. Interestingly, hybrids from *C. brunnea* which have *C. repens* or some other broad-leaved species as the other parent do not appear to exhibit this tendency to sucker. *Coprosma ×kirkii* 'Kirkii' is a good example. Never in all of the years that I have known it have I ever seen any indication that it would produce suckers from its roots, however, that is not to say that it will not reproduce from root cuttings and so it will be necessary to experiment with it.

SEED DORMANCY

Seed dormancy is another aspect of native plants about which we know so little. What are the factors, which cause dormancy in many species, and what treatment is necessary for that dormancy to be overcome? One grower may find that miro seeds (*Prumnopitys ferruginea* [syn. *Podocarpus ferrugineus*]) will germinate within a relatively short time (say 12 to 18 months) and another finds that germination is very erratic and may extend over a period of up to 5 years.

Some growers do not bother to give their native plant seed any kind of treatment before sowing. They just clean the seed and do whatever else is necessary to facilitate sowing and sow it, and then wait for it to germinate, regardless of how long it might take. Others religiously stratify the seeds or give them some other treatment. However, it appears that in either case the results can be variable. This is where we need more experimentation and research so as to find answers for these questions.

THE BEST CLONAL CULTIVAR

And finally, just a word about never being satisfied that the particular clone of a native plant being grown is the best one. It may be that it is a very old one which was brought into cultivation many years ago, and nobody has thought to see whether there might be a better one. In this respect I am referring to hardiness, pest or disease resistance, horticultural qualities, and anything else that will make it a good garden plant. It does not matter whether it is *Pittosporum tenuifolium* or *Hebe salicifolia*; there are always better clones out there and we should always be seeking to grow the best. I know that some propagators are doing this, but there are probably just as many who do not and just propagate whatever they have or happen to get.

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