Pingao (*Ficinia spiralis*) History and Propagation©

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INTRODUCTION

Pingao (*Ficinia spiralis*), sometimes called the golden sand sedge, is an endemic native sand-binding plant (Fig. 1). It grows naturally on the most active of coastal foredunes and is not found anywhere else in the world.

Fig. 1. Pingao (*Ficinia spiralis*) grows naturally on the most active of coastal foredunes.

Before European colonisation, pingao was widespread through the North and South Islands of New Zealand (Cockayne, 1911). It was used by Maori to decorate their wharenui (meeting houses), in the tukutuku paneling and in weaving kete (kits), and whariki (mats). However the introduction of farm animals and the spread of goats and rabbits decimated the colonies of pingao. The spread of maram grass (*Ammophila arenaria*) and lupins (*Lupinus* sp.) and other European grasses choked out pingao. More recently dune buggies and trail bikes have mutilated the sand hills.

By 1975 the status of pingao was described as vulnerable and this was reinforced in the 1981 publication of the Red Data Book (Essler, 1975; Williams and Given, 1981).

At the same time, the 1970s to 1980s, there was a renaissance in things Maori. It began with Te Kohanga Reo (the language nests) for preschoolers and there was also a focus on marae and refurbishing wharenui. With this came a greater interest in weaving using

harakeke (*Phormium* spp.), ti kouka (*Cordyline* spp.), kiekie (*Freycinetia* spp.) and pingao (*F. spiralis*). It became vitally important to research the propagation of pingao.

LOW GERMINATION RATES

At this time growing pingao from seed had the reputation of being difficult with very low germination rates (Bicknell and Butcher, 1986; Courtney, 1983).

Since pingao flowers in September in the Auckland area, seed heads were collected between mid-November to mid-December in 1983 at Whatipu (the north head of the Manukau harbour). After drying for 2 weeks the seed was sown and it germinated within the month at an estimated rate of 80% (Fig. 2). Seed collected in February in other areas was found to be largely infertile (Bicknell and Butcher, 1986).

Fig. 2. Germinated pingao (*Ficinia spiralis*) seedlings growing in a greenhouse.

Viability tests using tetrazolium on seed picked in April showed a potential for germination of 87% (Courteney, 1983). It seemed possible that a dormancy mechanism was laid down in the seed in the last stages of maturation. This problem can be negated by the early collection of seed heads.

Growing pingao by seed, after repeated trials in following years, proved to be the most

successful method of propagation. Taking cuttings or whole transplants, while successful in some instances, involved cutting down plants from an already scarce resource. All of this was reported at the IPPS New Zealand conference in 1985 (Oliphant, 1986).

SPREADING THE WORD

The problem at this stage was how to disseminate the knowledge that the hitherto negative reputation of growing pingao from seed had now become a definite positive.

The word was spread through conferences; the Maori and Pacific Island Weavers and the IPPS in 1985 and the New Zealand Maori Artists and Writers in 1986. Seedlings were grown, transported around the East Cape and donated to schools and interested individuals for 3 consecutive years. A television documentary was made under the Koha series which showed how to grow pingao from seed. The big breakthrough came in a letter to *The Listener* in 1986 which bemoaned the fate of pingao and the difficulty of its cultivation. In an immediate reply, notes on the propagation of pingao from seed were offered to anyone who requested them. There were over 50 individuals who wrote as well as people representing Regional Councils in Auckland, Wellington, and Hamilton; the Department of Conservation, Lands and Survey; Native Forest Action Council; Friends of the Shoreline; The Wildlife Service; Kokiri; high schools, Polytechnic Institutions; and the DSIR Botany Division from Christchurch and Havelock North.

The indigenous section of the New Zealand Forestry Research Institute (NZFRI) began rehabilitation trials with pingao at Waikawau Bay, Coromandel Peninsula, and Nuhiti Beach north of Gisborne. It was found that the application of a slow release fertiliser at planting gave a substantial boost to plant growth and is now recommended practice. On the other hand the use of hydrogel (Crystal Rain) did not improve growth or survival of planted seedlings during the following season (Bergin and Herbert, 1997). The NZFRI also evaluated provenance differences in pingao for growth and weaving characteristics and with the assistance of the Department of Conservation seed was collected and seedlings grown from 34 locations throughout New Zealand.

Research began on spinifex (*Spinifex sericeus*) (known also by the Maori name kawhangatara) propagation and re-establishment in the dunes as a companion sand-binding plant with pingao (Bergin, 1999). By 1990 there were thousands of pingao seedlings being grown in Polytechnic, Department of Conservation, and private nurseries, and planted out on the foredunes. A booklet “Pingao: The Golden Sand Sedge” was compiled with the participation of many individuals and published by Nga Puna Waihanga.

In 1991 Cambie and Cooper published their book “New Zealand's Economic Native Plants” in which they quoted “ Botany Division DSIR and the Department of Conservation had succeeded in developing techniques for growing pingao from cuttings and from seed: it will now be possible to set up pingao gardens to supply weavers with all the fibre they want and to increase wild pingao with nursery-grown plants” (Cambie and Cooper, 1991). These claims were inaccurate. The truth was that hundreds of people had been involved in sharing knowledge and in actively growing pingao from seed and planting out in the dunes from the early 1980s. This work had been documented and it predated the DSIR publication.

From the beginnings as the Coastal Dune Vegetation Network in the mid-1990s, the Dune Restoration Trust of New Zealand was formed in 2007. This is a non-profit charitable trust whose aim is to support and encourage the development of cost-effective practical methods for coastal communities and managing agencies to restore natural dune form and function focusing on the use of native plants.

Throughout New Zealand there are now 118 active beach care groups who have help from the Dune Restoration Trust, local councils, the Department of Conservation, and some local businesses. Given that 90% of the population of New Zealand live within 50 km of the coastline, beaches are an important part of their lives. Directing people with the use of boardwalk beach access through fenced dune areas has made a big difference to the survival of plants and to the general awareness of protected areas. All regional councils

throughout New Zealand have encouraged and funded beachcare groups from their dune restoration programmes.

At Kawhia in the early 1990s there was a total of 2,500 pingao seedlings planted on the coast over 3 consecutive years. Subsequent storms washed away part of the foredunes, the west coast being more vulnerable than the east to the prevailing winter winds. Rabbits have not been eradicated and cause damage. Vehicles can access the beach at low tide.

But 20 years later a Kawhia Beachcare Group has begun planting pingao and spinifex on the foredune again and remnants of the earlier pingao plantings were found.

The east coast of the Coromandel Peninsula is also under the Waikato Regional Council's control. At Pauanui beach the foredune had eroded away. Machinery was brought in to reform the area and it was planted in spinifex and pingao. This work was done between 2004 and 2006 (Fig. 3).

Fig. 3. Planting pingao on a foredune.

CONCLUSION

In conclusion, pingao the beautiful and useful golden sand sedge, a once vulnerable species, has in the space of 30 years become a much more appreciated and plentiful plant. This is due in part to the perseverance of plant propagators but mostly to the enthusiasm of all those volunteers who actively care for the seashore and its flora.

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