



PINGAO

expert sandbinder and weavers' gold

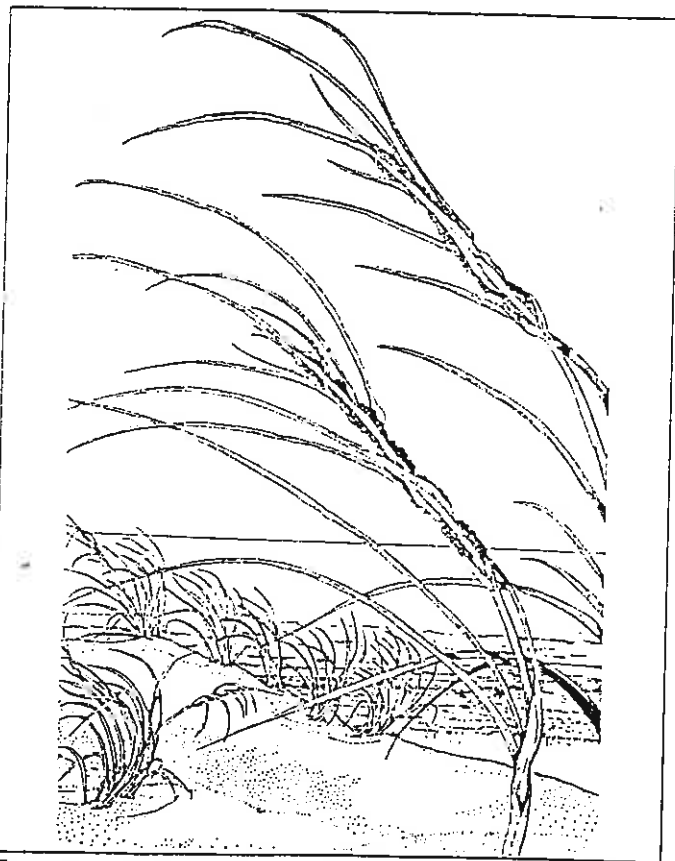
Anywhere along the coast, where breakers and wind have built dunes of sand above high tide, is the natural home of pingao (*Desmoschoenus spiralis*). Here, the sand is deep and constantly drifting: blown away or piled deep by winds from different directions. Surface temperatures become untouchable under the summer sun, and near freezing on calm winter nights. Except after rain, this surface sand is bone dry. The main source of nutrients is foam containing plankton, blown from the sea. Few plants can tolerate these extreme conditions, but pingao thrives. The only other native plants that do are sand daphne (*Pimelea arenaria*), and spinifex (*Spinifex sericeus*) whose elegant trailing runners, with their silvery leaves and tumbling seed heads, often grow alongside pingao. Both pingao and spinifex are specialist sandbinders.

Pingao is a large robust sedge (in the family Cyperaceae), found naturally nowhere else in the world. Its thick rope-like stems stabilise the sand, sending down long fine roots with moisture-collecting coverings: there is always moisture below the sand surface. From the same strong stems arise curving tufts of narrow grass-

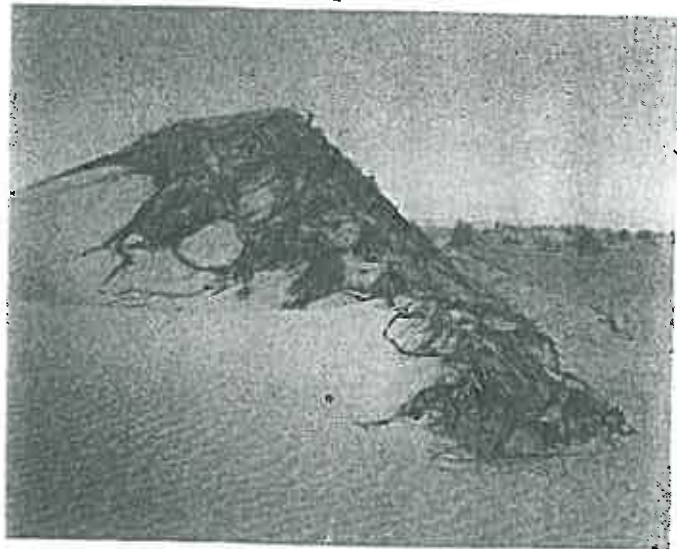
like leaves, some a metre long. It is these leaves that give pingao its wonderful colour, making it stand out from all other vegetation: green-gold in winter turning bright orange and later deep yellow in summer. This is the traditional Maori weavers' gold: carefully harvested leaves hung to dry, to be used in intricate tukutuku panelling and special decorative woven articles. No other plant or dye in nature could supply the same vivid longlasting colour.

Distribution and threats

Pingao once grew on almost every sandy shore, from the far north to Stewart Island and in the Chatham Islands. It provided food and shelter for small native shore-dwelling animals: spiders, beetles, moths and their larvae, earwigs, centipedes, sandhoppers and lizards, even nesting and roosting birds. Now colonies are few and far between, mostly under siege and in decline. Fires, coastal subdivision, roading, sandmining, dumping, farming, vehicles, overharvesting, weeds and wild animals are the problems.



From Moore & Adams: *Plants of the New Zealand coast* (1963)



The death of pingao will cause this dune to collapse.

Among farm animals, cattle are the most destructive, eating the leaves, uprooting stems and trampling plants. Goats, deer, sheep and horses also browse pingao. So too do smaller mammals: possums, rabbits and hares, which nip out young growing tips and, worse still, destroy seedlings as they struggle to become established. Marram grass, a vigorous introduced sandbinder, is pingao's severest competitor,

capable of totally excluding it from dune systems. Lupins, pines and pampas grass can overtop pingao and elbow it out too. While many weavers do little damage by taking only the leaves they need, some destructively and wastefully cut off whole growing tips. If any one of these factors were in operation alone, pingao might survive, but when they are combined - such as cattle with marram grass, or trail bikes with rabbits and heavy-handed harvesting - the onslaught is overwhelming and pingao is doomed.

Pingao in cultivation

Until recently, it was generally believed that pingao was virtually impossible to cultivate, but a few determined people have succeeded. Not only can pingao be grown from cuttings - so long as adequate lengths of woody stem are taken and looked after carefully like any special plant material - but it can also be propagated readily from seed. Using seed is better, because the parent plants are injured less, and seedlings are more adaptable for planting out. Seed must be gathered before it falls or is eaten by birds (early to mid summer) and either sown fresh or stratified (placed in a refrigerator with moist sand for 4-6 weeks) before sowing. No special germinating or potting mixes are required, provided sufficient (but not excessive) moisture, warmth, nutrients and drainage are given.

Surprisingly for a specialist dune plant, pingao can be grown successfully as a potted or garden plant, and will withstand considerable frosts. It fares best in well-drained soil, sand, pumice or sawdust, and responds to modest feeding. If partly buried periodically in loose material (such as sand or sawdust), it will send out vigorous new shoots. The greatest problems in cultivation are fungal diseases and grass mealybugs: not threats in the coastal wilds, these can both be dealt with using preventative applications of fungicides and insecticides.



Cultivation trial of pingao at DSIR, Hawke's Bay.

Planting out

The relative ease with which pingao can be cultivated gives real hope for this special plant. The Department of Conservation and the Ministry of Forestry are exploring this on a large scale. It should be feasible to establish pingao gardens that supply local weaving needs, taking the pressure off remaining wild populations. It should be possible to establish "new" populations in the wild from nursery-grown stock, even in the kind of dune rehabilitation work that marram grass is used for: the combination of pingao and spinifex would be best for this.

The revitalisation of existing declining populations using cultivated pingao is possible. Only plants propagated from the local source should be used, because pingao varies considerably in form from place to place. Thousands of plants have been raised and planted in several localities recently, but unfortunately most have died because of unsuitable treatment. There are several important considerations to make when planting pingao:

1. Larger and stronger plants will be more likely to become established: it is suggested they be at least 30cm tall and two or three years old, and have well-developed root systems.
2. Best sites for planting are dune hollows, where there is moisture and where sand movement is minimal.
3. Protection from browsing animals and vehicles is essential.
4. Planting should be done in autumn, so that plants can acclimatise before the heat and dryness of summer.
5. Competing weeds need to be kept in check. Marram grass, the worst, can be chemically controlled with 'Gallant' herbicide.

Pingao in the wild

More important though than planting pingao is the maintenance and encouragement of remaining wild populations. If fences are built to exclude farm animals and vehicles, small mammals are kept to modest numbers, competing plants (especially marram grass) are controlled, and harvesting is sensitive, we should be able to continue to enjoy the presence of this wonderful plant in its natural home.

Text by Geoff Walls 1989.

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