

## INTERIM INVESTIGATION SUMMARY 1994/95

Title	Sustained yield harvesting of pingao						
Venue	All		Investigation leader and agency		J. W. Herbert and D.O. Bergin New Zealand Forest Research Institute, Rotorua		
Key Output	6.22	Investigation number	P1383	Investigation status:	In Progress	Completion date:	30.6.96

### OVERVIEW:

The requirements of Maori people for pingao for traditional weaving purposes (tukutuku, kete) is far in excess of the sustainable yield. Most local stands, and even the major traditional sources of pingao fibre, at places such as Himatangi, Raumatiu-Kotiata, the Northland Coast and other areas are in decline. This coincides with a resurgence of interest in traditional weaving skills. Being a fibre for which there is no substitute it is vital that existing populations of pingao are maintained or extended for new generations of weavers. The causes of this decline are many but for many populations there is no doubt that inappropriate harvesting methods are contributing to the decline. In the past the harvesting of pingao was governed by Tikanga Maori but now much harvesting is indiscriminate and even exploitive. The Indigenous Forest Management group, NZFRI, have been investigating the effects that different harvesting methods have on pingao plants.

### INTERIM CONCLUSIONS:

- harvesting by clipping is a more efficient and targeted method of harvesting weaving quality pingao leaves than by cutting
- clipping results in few leaves being rejected for quality or size; cutting results in a high reject rate for leaf quality and size
- there are indications that summer harvesting produces larger numbers of weaving quality leaves

### INTERIM RECOMMENDATIONS:

- that for reasons of plant conservation and fibre quality, and in the appropriate situations, that harvesting of pingao using the clipping method be regarded as the the first choice option.

### PUBLICATIONS OR OTHER SIGNIFICANT OUTPUTS:

- Bergin, D. O.; Herbert, J. W. 1994: Restoration of native plant communities on sand dunes in New Zealand. *Proceedings of Fourth Annual NSW Coastal Conference*, Terrigal, 18-20 October 1994. Gosford City Council, NSW, Australia.
- Bergin, D. O.; Herbert, J. W. 1994: Restoration of native plant communities on sand dunes. *What's New in Forest Research*, New Zealand Forest Research Institute, No. 232. 4p.

### OBJECTIVES:

1. To test the effects of at least two contemporary methods of harvesting on established pingao plants (June 1994).
2. To quantify the amount of useable fibre obtained from the different harvesting methods (June 1995).
3. To test whether the season of harvesting affects the plant's response and fibre quality (June 1996).
4. To make recommendations of harvesting methods for pingao most appropriate to sustaining the resource (June 1996).

### METHOD:

This trial, addressing objectives 1, 2 and 3 was established in mid December, 1994, on low dunes immediately to the east of the Rangitaiki River mouth, near Thornton, in the Bay of Plenty.

A complete randomised block design was used in which there were 25 blocks containing 5 randomly allocated treatments per block. Treatments were restricted to lateral (side shoots) because the leaves of terminal shoots are



invariably curved and less desirable for weaving.

The treatments were:	summer clipping (December 1994)	summer cutting (December 1994)
	autumn clipping (March 1995)	autumn cutting (March 1995)
	control (December 1994)	

Harvesting techniques used were:

**cutting** The whole leaf cluster was removed by cutting below the base. This is a commonly used method.

**clipping** The weaving quality leaves were selectively removed from the shoot by clipping with citrus secateurs.

**control** No removal of leaves or shoots.

The wrenching treatment used in the Santoft trial (reported on in the 1993-94 report) was not repeated because of difficulty in using it successfully on pingao, and because it almost invariably resulted in death of the shoot.

After harvesting the number and length of new (juvenile) shoots associated with the treated shoot were recorded in order to test for responses in subsequent growth (to be reported on in June 1996 when measurements are completed).

### Quantifying the amount of useable fibre:

The amount of useable fibre obtained from the different treatments was quantified using a sieve process. The total leaf material harvested from each shoot was divided into reject and useable material. Whole leaves were rejected if they were too coarse (usually the thickened outside leaves which tend to split or break when bent), discoloured (some leaves have discoloured spots on the leaf surface, and these spotted areas tend to quickly break down or split when the fibre is incorporated into woven articles), excessively curved (fibre sections will not lie parallel to each other when used in weaving). A fourth "other" reject category included browsed, broken and insect-damaged leaves.

The remaining leaves were measured and sub-divided into "large weaving quality" leaves - those with at least a 100mm long section of leaf greater than 4mm width - and "small" leaves many of which would be useable in weaving articles such as ear-rings and ornaments but less suited to larger, more conventional, articles. These latter two categories were originally derived for, and used in assessing, Manawatu coast pingao, which tends to be larger than the Bay of Plenty pingao. Consequently, most of the Bay of Plenty pingao was too small to be classed as "large weaving quality" and the analyses in this report group all weaving quality leaves together.

### INTERIM RESULTS:

- overall, the cutting method produced nine times as many leaves (75) as the clipping method (8 leaves)
- of the average of 8 leaves harvested using the clipping method, 4 were "large weaving quality" (a minimum 10cm length exceeding 4mm width) and 4 were slightly less. Because all were selected as being of weaving quality only a few were subsequently rejected as defective and this only because of selection aberrations.
- of the average of 75 leaves harvested using the cutting method, about 28 leaves (37%) were rejected for quality defects. On average, 3 were too coarse, 7 had colour defects, 3 were excessively curved and 15 had "other" defects. Of the remaining 47 leaves, 3 exceeded the "large weaving quality" criterion and the balance (44 leaves - 59% of the total) were classed as small. They were normally distributed about a mean of 32 cm and a range of 4cm to over 70cm with respect to length
- in all, 96% of the cut leaves were down-graded for defect or smallness. However, some of the small leaves were acceptable for some weaving purposes
- the average overall length of "large weaving quality" leaves for both clipped and cut leaves was 59cm
- there are indications that, for both harvesting methods, that there were more "large weaving quality" and total weaving quality leaves harvested in spring than in autumn. In all cases autumn harvested leaves tended to be slightly longer than spring harvested leaves but not to the extent that this would impact on weaving options.