management system was developed which would overcome most of these problems. This management system has been described in previous Horticulture Technical Annual Reports.

4.8.2 MANAGEMENT TECHNIQUES FOR CASHEW

S McAlister and R Renfree

Two cashew selections, one from the collection of hybrids at King Producers' Venn block and one from the CPHRF Brazilian seedlings were outstanding. In previous experiments, these selections were grown in single tree plots. Competition from neighbouring trees and the lack of competition from neighbouring trees (where trees were missing) made fair assessment of 'per hectare' yields unrealistic. The new planting at KRS will assess these two selections in multiple tree plots while further developing management systems.

Originally, an observation block was planted at KRS in December 1997 as a demonstration of new genotypes and technology development. The planting consisted of five rows of 16 trees with 8 metres between rows and 5 metres between trees within the rows. The middle three rows contained 21 trees (3 rows x 7 trees) each of the Hybrid 6/1 from King producers and of the seedling 5/9 from CPHRF. The two outside rows and the end trees on the three middle rows were buffers of various scion rootstock combinations and including some promising cultivars from Kununurra. However, the trial was devastated by grasshoppers. Not only was the foliage affected but many of the young trees were effectively 'ring barked' as the grasshoppers stripped the bark, in some cases, to ground level. The trial will stop. Some trees of the 6/1 hybrid and the 5/9 hybrid have been kept as a source of propagating material.

5.1.1 CULTIVAR EVALUATION OF A HOST OF ANNUAL CROPS - KATHERINE

S McAlister

There was no plantings made as part of this project in 1999 as the vegetable research plots at the Katherine Research Station were planted with a green manure crop which was then ploughed in and the land left fallow.

5.1.2 BAMBOO RESEARCH

K Blackburn and M Traynor

The Bamboo Research Project is partially funded by RIRDC and is an Australia-wide research investigation involving Central Queensland University, Bamboo Australia, Queensland DPI and NT DPIF. The objectives of the project are:

- To identify suitable species for bamboo shoot production;
- To develop cultural methods to optimise shoot production;
- To assess the market potential of trial quantities of shoots; and
- To collate and extend information.

Materials and Methods

The trial was planted on February 24, 1995 comprising 162 plants of *Bambusa oldhamii* and covering an area of nearly one hectare. It was unfortunate that at the time, the two most preferred species *Dendrocalamus asper* and *D. latiflorus*, were far too expensive to be used in the trial and although *B. oldhamii* was selected on price we were assured that it was a tropical type and would perform well in Darwin.

The trial is a 3x3x3 factorial arrangement with a split plot design comprising the following treatments.

3 irrigation levels	-	30, 60 and 90% evaporation replacement.
3 fertiliser levels	-	(i) 125N – 31P – 93K
		(ii) 250N – 63P – 189K
		(iii) 375N – 94P – 282K

3 replications

Results

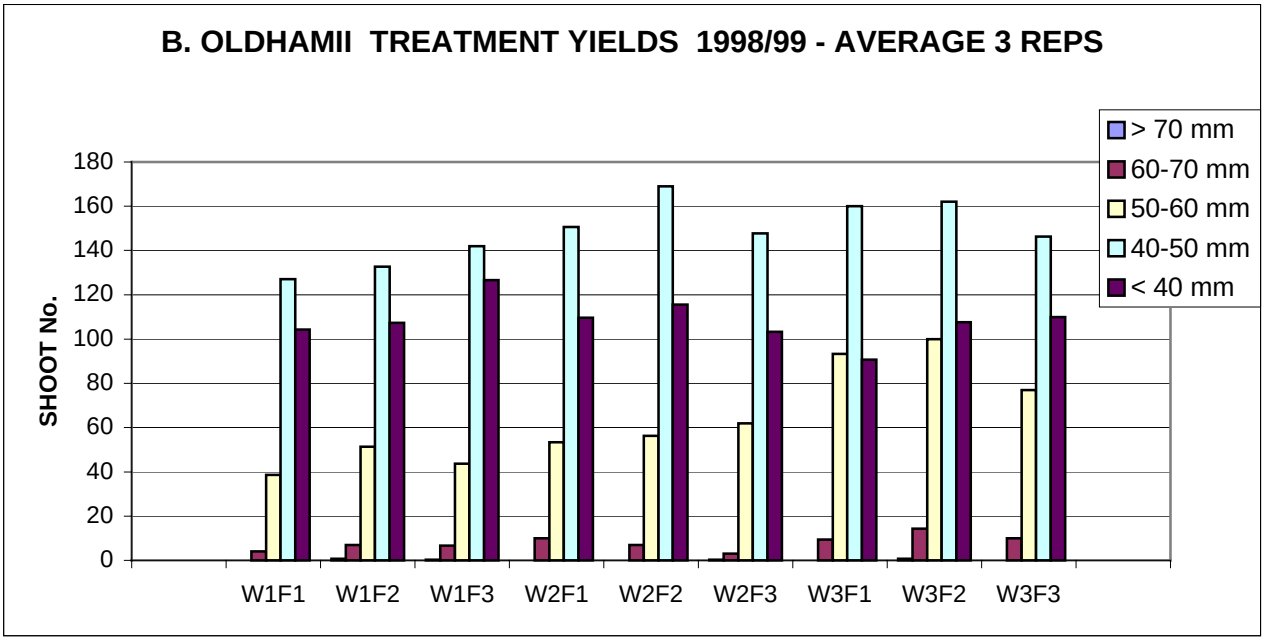
The initial growth rate of this species was very encouraging with few problems encountered; the major pest problems have been a leaf-rolling caterpillar and a hard scale on the culms. Clump thinning has been a major labour-intensive operation carried out in April each year to leave 10-12 culms per clump which include 3-4 mature and 6-8 new culms for growing on. As well, the clumps of this species require regular trimming, which is a poor characteristic, to allow access for harvesting.

The first trial harvest in 1997 was conducted from October 15 to November 24 until shoot numbers and size decreased markedly. An average of 18-20 shoots were harvested per plant as an average weight of 167gm over the 5-week harvest period. The fertiliser treatments were imposed on the trial after the completion of harvest in February 1998 and the irrigation treatments were put down, after some delay, in July 1998.

The irrigation treatment (i) 30% evaporation replacement was changed to nil irrigation from the onset to determine the effect on the dormant growth period and due to the lateness of imposing the treatments.

The 1998 harvest commenced in early November and was terminated in late January 1999. There was little yield difference between treatments and grades of shoots (Figure 1) although there was a trend to higher yields of the larger shoot grades in the 90% evaporation irrigation treatment (W3). The data will be analysed at a later date but significant differences between treatments is not expected. The results of the trial suggest what has been known for some time, that *B. oldhamii* is not adapted to local climatic conditions and has been under considerable stress. As a result, the future of this large trial based on this species is under serious review.

Figure 1. Bambusa Oldhamii treatment yields 1998/99



The two preferred tropical clumping species *D. asper* and *D. latiflorus*, with 5 and 7 plants, respectively, in the varietal collection, were also harvested and compared to *B. oldhamii*. Table 1 summarises a comparison with *D. latiflorus* where very large differences in species performance can be seen at 4 years of age. Although the average shoot weight of *B. oldhamii* was only 120g, 78% of the shoots had a size grading of less than 110g and were considered unmarketable. Because every shoot had to be harvested, the cost of harvesting this species was very high compared with the species with larger shoots.

Table 1. Comparison of B. Ohdhamii and D. Latiflorus

	No. Shoots per clump	Total shoot wgt per clump (Kg)	Av. Shoot wgt (Kg)	Total Yield T/ha	Harvest Cost $/tonne/ha	Marketable %
B. oldhamii	55	6.5	0.12	1.2	4064	22
D. latiflorus	33	37.7	1.13	6.7	441	100

Figures 2 and 3 summarise the size distribution and shoot numbers of each clump of *D. latiflorus* and *D. asper* and illustrate the large size of the shoots. Clump 1 in *D. latiflorus* was a very high yielder compared to the other clumps and was the first clump in the row. Figure 4 shows the relationship between rainfall and the pattern of shoot emergence in *B. oldhamii*. Although the plants were given sufficient irrigation water from 1 month before harvest the occurrence of rain was still closely related to shoot production, suggesting that excess water may be required to achieve optimum production. The withholding of irrigation water during

the dry season may be a method of manipulating the plants and promoting early shoot production. The nil water treatment (W1) on the trial did not have the desired effect on *B. oldhamii* in 1998 and any effect on the time of harvest may differ widely between cultivars.

Future issues to be dealt with include:

(i) The two preferred species, *D. asper* and *D. latiflorus*, may differ in terms of maturity and period of harvest and should be investigated further.
(ii) These two tropical clumping types have large shoots (1-3 kg) which could cause post harvest problems and marketing difficulties.
(iii) Packaging, presentation, marketing and post harvest research present major challenges.
(iv) With such a large hand labour component, the economics of the crop will depend very much on obtaining a good market price.

Figure 2. D.Latiflorus - Shoot numbers 1998/99

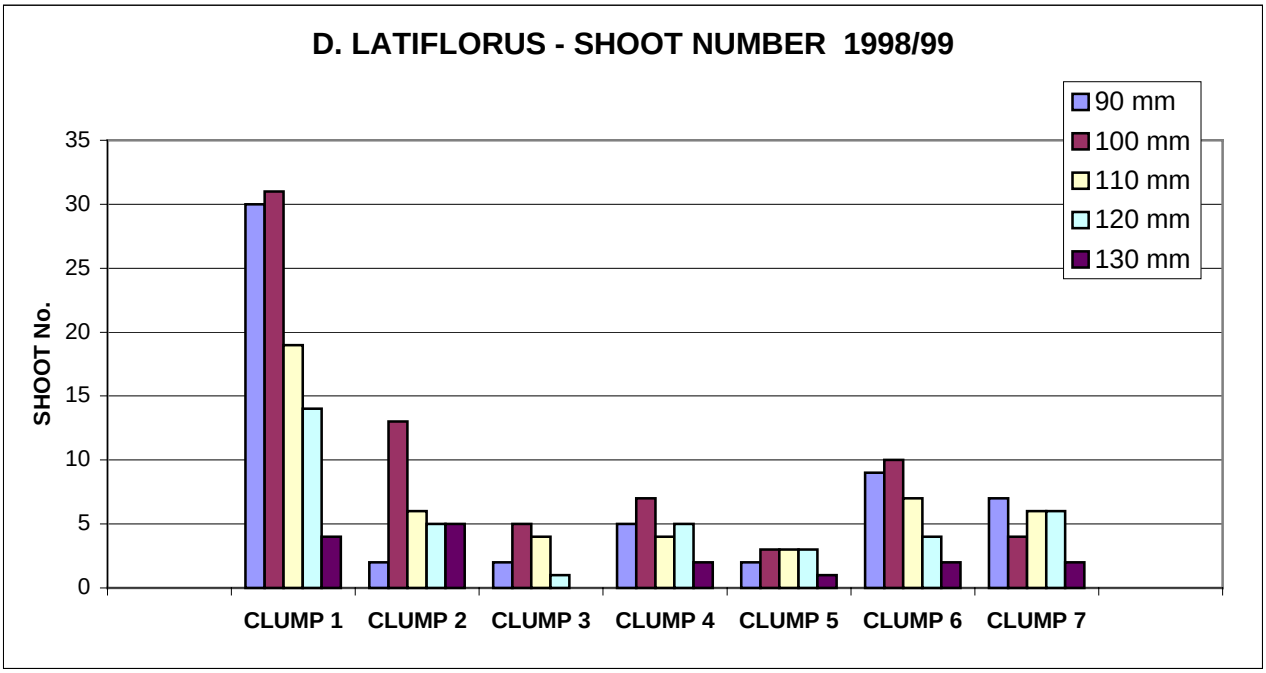


Figure 3. D.Asper - Shoot number 1998/99

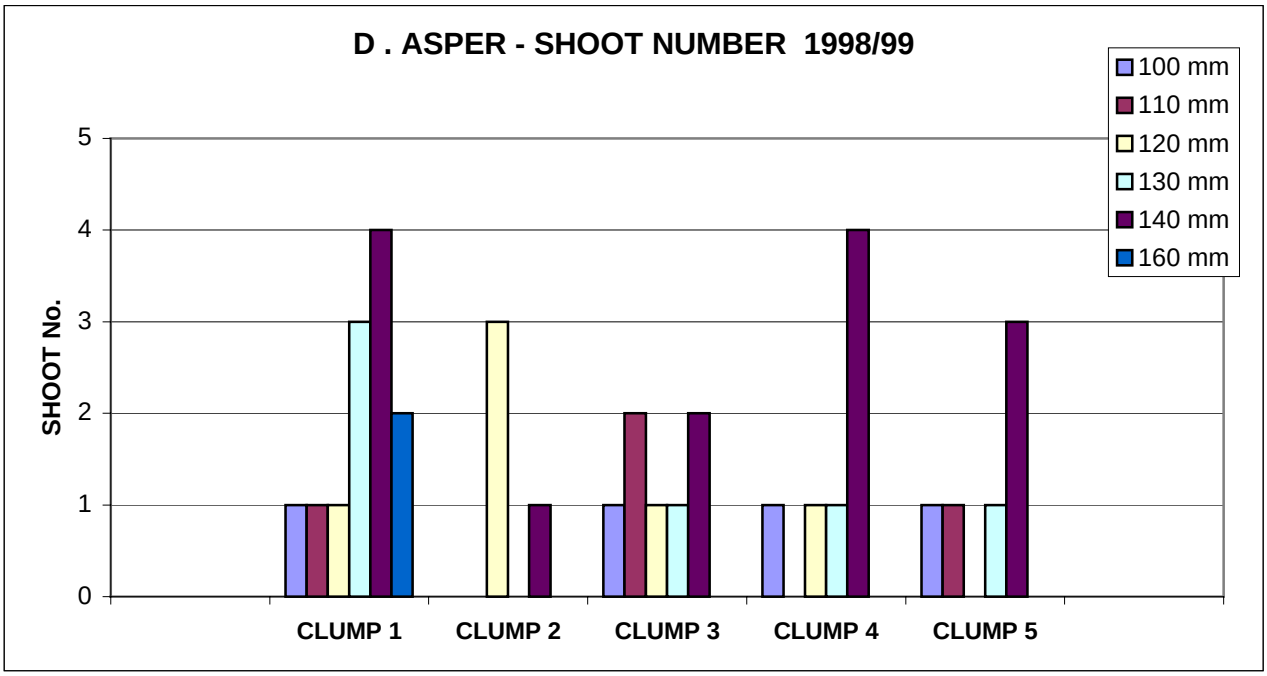


Figure 4. Bambusa Oldhamii 1998/99