



Figure 15. Change in *M. darwiniensis* activity in aggregating tins following Amdro® treatment on 22 March 1995

The formulation AMDRO® was not suitable for baiting *M. darwiniensis* in the field, using the moist cardboard aggregation technique, as it is susceptible to fungal infection and appears repellent to *M. darwiniensis* in that state. Further testing, using alternative field techniques or alternative hydramethylnon formulations may be warranted.

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## Bamboo Research 1994

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The bamboo research project is partially funded by RIRDC and is an Australian joint research investigation combining inputs from:

- The University of Central Queensland, Rockhampton (Principal Organisation).
- Bamboo Australia, Belli Park, Eumundi, Queensland (Commercial grower).
- Queensland DPI, Bundaberg Research Station.
- NT DPIF, Coastal Plains Research Station.

The objectives of the project, which was approved and funded in August 1994, are:

- To identify suitable species for the production of bamboo shoots under Top End conditions.

- To gain expertise in the cultivation of selected species and to develop cultural practises such as irrigation and fertiliser scheduling for optimum shoot production.
- To release trial quantities of fresh product to assess its market potential.
- To collate and extend information on species performance.

There is, effectively, no production of bamboo shoots within Australia. Canned bamboo shoots are currently imported from SE Asia with a retail price between \$3 and \$6 per kg. and an estimated Australian consumption of 1,357,000 kg. (value \$6 M) per annum. A potential export market exists for fresh shoots into Asian markets, particularly Japan, where they represent the largest category of imported fresh vegetables into the country (44 - 85,000 tonnes p.a.).

Two project officers visited Belli Bamboo Farm from 18 - 23 November 1994 to attend the first RIRDC meeting on the project, as well as attending a Bamboo Workshop conducted by the grower participant, Mr. Durnford Dart. A visit was made to Bundaberg Research Station to discuss the co-operative project with researchers and to inspect the bamboo collection. On the return trip to Eumundi, a visit was made to Rollo Campbell's Tiaro Bamboo Nursery and varietal collection. The RIRDC meeting was attended by John Leonardi of UCQ, Peter Bindon of the Australian Bamboo Network (Perth), Mr. Dart and the NT officers. The RIRDC project was discussed at length and much valuable information was collected to support the NT part of the project. The most suitable bamboo species was selected and arrangements were made to have the plants prepared and grown on, for shipment to Darwin early in 1995 for trial establishment.

A varietal collection of over 25 cultivars has been collected by DPIF to examine cultivars that are used for timber, windbreaks, fences and ornamental types as well as edible bamboo.

- An older collection of 12 species of bamboo (single plants) gathered from around the Darwin area is now over 2 years old, but has only been managed well for the past year (Table 36).

**Table 36. Bamboo species being examined**

Bambusa arundinacea
Bambusa vulgaris var. vittata
Bambusa vulgaris var. wamin
Bambusa glaucescens
Bambusa vulgaris
Bambusa arnhemica
Bambusa sp.
Thyrostachys siamensis
Schizostachyum brachycladum
Nastus elatus
Gigantochloa apus
Gigantochloa sp. Timor Giant Black

- A new collection of bamboo (15 species) was purchased by DPIF from Belli Bamboo Farm with 2 plants of each species. This collection includes *Dendrocalamus asper*, *D. latiflorus* and *Bambusa oldhami*, the 3 preferred species for edible shoot production in the tropics (Table 37).

**Table 37.**

Bambusa eutuldoides
Bambusa textilis
Bambusa oldhami
Bambusa tuldooides
Bambusa multiplex var. riviereorum
Bambusa ventricosa
Bambusa multiplex
Bambusa polymorpha
Guadua angustifolia
Gigantochloa atter
Gigantochloa var. Malay dwarf varieg
Gigantochloa apus
Psuedosasa japonica
Dendrocalamus asper
Dendrocalamus latiflorus

## **The Level of Effectiveness of Various Control Methods to Reduce Bird Damage on Horticultural Crops**

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The types of control methods used to repel birds can be described by their mode of action which are visual, audio/sound, barrier and chemical. These control methods either replicate something natural which birds find threatening or distressing, or give the bird an unexpected fright.

Visual methods used to repel birds are usually in the form of objects, shapes and colours. These include such things as scarecrows, models of birds of prey, shiny bright objects, coloured balloons and lights. Audio or sound repellents include sudden loud or unusual noises such as explosions, gunfire, loud piercing alarms, horns and the recorded sounds of birds in distress played over amplifiers. For both the visual and audio methods to be effective these need to be administered as soon as the birds start to become a problem.

Netting provides the only real barrier method to exclude and repel birds from crops. However, netting has some disadvantages as an acceptable control method particularly on fruit crops. The main disadvantages of netting has been the high cost of materials and the perceived difficulty of applying and removing the netting. The types of netting options available has overcome some of these problems and made it increasingly acceptable.

The use of chemical repellents is another control method but this has not been widely used on horticultural crops due to the amount needed to be applied to have an effect on all birds. Other disadvantages are the cost of the chemical and the problem of chemical residue left on the fruit.

The objective of this project is to investigate and assess the various bird control methods - visual, audio and barrier - for their level of effectiveness in relation to repellency and persistency.

These bird control methods were trialled under field conditions with no controls. Trials were assessed by observation and monitoring of the birds' behaviour and the response exhibited by the birds to each control method.

Balloons were used and placed in the rows between trees, above and in the trees. Large circular shapes were painted on variously coloured balloons to represent the threatening shapes found under the wings of some birds of prey. Balloons were either flown alone or with attachments such as tinsel, streamers and alfoil plates. Normal party and larger balloons were either blown-up manually or filled with helium gas. A number of these balloons were placed in an area of the orchard and observations were taken.

Plastic cut-out models of hawks were tested and these were flown at heights of 2.5 to 3 metres under balloons or PVC pipe which allowed the model to move in the wind. A model hawk was placed in a small area of the orchard and monitored. As well, a plastic model of an owl was tested in the orchard to see whether birds would respond to it.