PANDANUS DIEBACK IN TWEED SHIRE NSW, CAUSED BY THE PANDANUS PLANTHOPPER *Jamella australiae*

Index

1. Background

One of the north coast's iconic plants, the coastal Pandanus tree *Pandanus tectorius*, is under local threat from dieback caused by a flatid insect known as the Pandanus planthopper *jamella australiae.*

The Pandanus planthopper is native to northern Queensland where it is naturally controlled by egg parasitic wasps.

During the 1990s, the Pandanus planthopper was found to be spreading and infesting Pandanus trees through extensive areas of southeast Queensland, this led to dieback and eventual death of thousands of Pandanus trees. Researchers from QLD National Parks and Department of Primary Industries carried out extensive research on the problem in South East Queensland.

Planthopper induced dieback is caused by extremely heavy infestations of planthoppers sucking the plant's sap from the leaf sheaths. The planthoppers exude honeydew; this encourages mould growth and rotting of terminal growth points.

As planthoppers have a short flight range, spread to new areas is most likely to be caused by the movement of potted and transplanted Pandanus trees within the nursery and landscape industries.

Infestations of the Jamella planthoppers have recently spread to northern NSW.

Photo shows a large Pandanus tree showing early signs of dieback

2. How to recognise Pandanus planthopper induced dieback

Even healthy pandanus trees regularly have large amounts of dead leaf around the base of the leaf heads. However, when Pandanus planthoppers build up large populations in trees, the percentage of dead material is increased and leaf material in the centre of the head is likely to be affected. Leaf dieback often begins on the northern (warmer) side of the tree or in trees on the northern edge of tree clumps. Planthoppers and their cast skin casings can usually be seen between leaf sheaths and their egg cases found under leaves of infested trees.

Black sooty mould, caused by the insect's sugary secretions, can usually be seen on the leaves and trunks of badly infested trees.

3. What do planthoppers look like?

Pandanus planthopper adults are flattened sucking insects up to 8mm long with mottled grey-brown wings. The juvenile stages are 2-8mm long with long waxy filaments extending from the rear. Both adult and juvenile stages are likely to hop if physically disturbed.

Pandanus planthopper eggs, juveniles and adults
(Photo courtesy Nat Smith QLD National Parks)

Juvenile planthoppers feeding within leaf sheaths

Numerous planthopper egg rafts attached to the underside of Pandanus leaves. Each egg rafts contain up to 50 eggs each

Planthopper adults, eggs and nymphs with associated sooty mould growth on leaves caused by the insects honeydew excretions

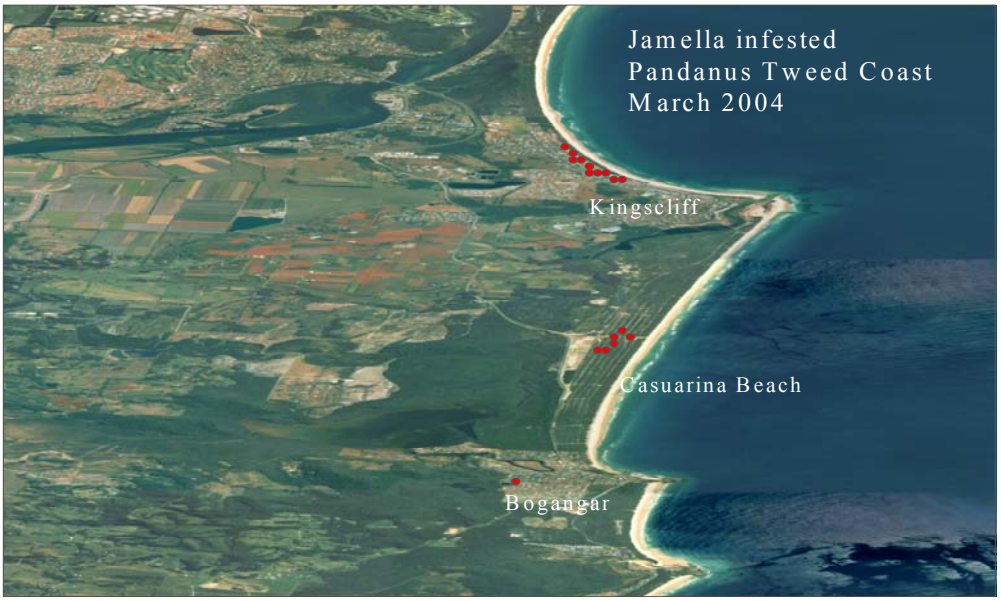
4. The Tweed experience

Council's entomologist inspected several ailing Pandanus trees at Kingscliff Beach foreshore reserve in March 2004. Inspection revealed large planthopper populations in these trees and moderate to light infestations in Pandanus within a 200 metre radius of the infested trees. Further inspections throughout the Shire over the following weeks indicated isolated planthopper infestations at Casuarina Beach and Bogangar.

Pandanus protection advice was sought from authorities within Queensland National Parks, Queensland Local Government and contract arborists that had dealt with Pandanus planthoppers on the Sunshine and Gold Coasts.

Given the relatively small areas found within the Shire infested by planthoppers, it was considered viable to try and eradicate the pest by insecticide treatment of affected Pandanus trees and surrounding Pandanus in buffer areas. Significant coastal Pandanus landscape trees around the Shires' beaches and headlands were also treated.

Soon after finding these infestations, Tweed Council extensively publicised the Pandanus planthopper problem and the proposed control measures within the Shire. Publicity was particularly aimed at plant nurseries and landscapers as well as residents with Pandanus on their property. Residents with Pandanus were advised to contact Council for advice and free injection of their trees if necessary.



Tweed Coast distribution of Pandanus planhoppers March 2004

5. Control

The systemic insecticide Confidor 200SC, containing the active ingredient imidacloprid, was applied by injecting trunks and limbs of medium to large Pandanus trees and spraying the throats of small trees. Injection began in early April 2004 with the bulk of the infested areas treated by the end of May 2004.

Injection was carried out with "Sidewinder" injection equipment. Following Pandanus trunk or limb drilling and injection with 5 millilitres of the mixed insecticide, tree injection holes were sealed with plastic plugs to hold the chemical and aid rapid healing of the injection site.

Confidor applied with Sidewinder equipment has been well researched and tested on Pandanus in Queensland and shown to control planthoppers and inhibit Jamella reinfestation of Pandanus trees for several years. The technique is considered to be safe for the trees, the environment, the operators and public.

Leaf stripping was also carried out where possible on badly infested trees to quickly reduce planthopper populations on the trees. Leaf stripping also aids in reducing sooty mould and limb rot as well as stimulating new growth.

Injecting Pandanus at Kingscliff with "Sidewinder" equipment

6. Results of treatment

Within 4 to 5 months of insecticide treatment, most trees with light to moderate planthopper infestations showed signs of recovery and harboured no visible live planthoppers, these trees developed strong vegetative regrowth by 12 months post treatment.

Trees that were heavily infested with planthoppers at the time of systemic injection, struggled to survive, with several trees dying over the following 12 months. It was apparent, that due to the slow uptake of systemic insecticide by injection, many of the badly infested trees were treated too late to save them. This was likely exacerbated by the lateness in the season at the time of injection followed by 6 months of drought conditions.

7. Where to from here?

- Tweed Council Entomology staff monitor Pandanus trees along the Tweed Coast regularly for signs of planthopper occurrence and in conjunction with Council's Recreational Services will treat any further Jamella infestations found within the Shire.
- Isolated planthopper infestations have more recently been found within Ballina, Byron and the Clarence Valley Council areas. Local councils, NSW Department of Environment and Conservation or contractors are treating these infestations.
- Tweed Council is part of the NSW Pandanus Planthopper Working Group, which has representatives or support from the above councils as well as relevant NSW government departments, Landcare, the nursery industry and catchment management authorities. Extensive mapping of northern NSW Pandanus populations and the health of these populations have been carried out and are further being been carried out by these groups.
- NSW authorities are considering potential introduction of Jamella planthopper specific egg parasitic wasps into NSW from Queensland. These wasps have

proven to be beneficial for biological control of Jamella insects in some southern Queensland areas but may not be suitable in more temperate coastal NSW areas.

- Extensive contact is being made with the plant nursery and landscape industry to restrict further spread of Jamella planthopper infested trees. Consideration of legislative control of Pandanus movements from infested areas is also being considered as it is this movement that can potentially spread Pandanus planthoppers to new areas or re-infest areas following planthopper eradication.

8. How you can help

The Pandanus Planthopper Working Group has developed the following suggestions:

- Become familiar with the symptoms of affected plants and monitor them
- Notify your local council of Dept of Environment and Conservation (for plants in National Parks or Nature Reserves) or the Dept of Lands (for Crown lands) if you believe a plant is affected.
- When planting Pandanus use locally grown stock and inspect plants carefully for any sign of infestation.
- If disposing of plants or plant parts that are infested, exercise extreme caution to prevent the spread of planthoppers to unaffected areas.
- Any infested plant leaves or parts should be sealed in bags and placed in a bin or mulched and composted.
- Contact your local council to find out what assistance or further information can be provided. Some councils provide stem injections to infested plants.