the Australia and New Zealand School of Government

CASE PROGRAM 2006-10.4

The Painted Apple Moth Eradication Programme (D - Postscript)

In June 2004, members of the PAM response team began to document their experiences in a close-out document for use by the wider MAF in future responses. Its findings covered response management (in particular resourcing issues that led to performance issues), policy, legal compliance, contracts, communications, the health service, operations and science, with shortcomings identified in each area, including the fact that learnings from the tussock moth campaign were not captured and transferred effectively.

The close-out document also identified "what was done well", to be referred to in future. Decisions seen as key to the eventual success of the project included the establishment of the project itself, with strong leadership, and the appointment of Agriquality to run the operational side; and ultimately, the securing of sufficient funding. It noted that improved management procedures for multiple contracts, and a new blueprint for future response communications had already been developed, along with a set of generic operational procedures for future response.

In November 2004, in line with recommendations of the Biosecurity Strategy published in 2003, MAF Biosecurity became Biosecurity New Zealand, the lead agency for biosecurity, with an extended role. Barry O'Neil was named as the Assistant Director-General in charge.[1] The new organisation is structured according to a "points of intervention" model rather than by sector. The six structural units are policy and business, pre-clearance, post-clearance, incursion investigation and reference laboratories, animal welfare and compliance and enforcement.

This case was developed by the Australia and New Zealand School of Government (ANZSOG) and funded by the New Zealand Ministry of Agriculture and Forestry (MAF). The case was written by Janet Tyson, with supervision by Dr Richard Norman, Victoria University of Wellington. This is a postscript to the cases 2006-10.1, 10.2 and 10.3.

[1] MAF Media Release 1-11-04: MAF Launches Biosecurity New Zealand.

The new structure brought together technical expertise from across the previously separate sectors, to provide a more efficient use of skills and resources. The change highlighted the wide variation in previously existing processes and practices, but also, according to Barry O'Neil, allowed the selection of a range of "best practice" procedures.

In 2005, the Painted Apple Moth was trapped in Auckland on five occasions. This time the catches could be subjected to DNA testing and a new Otago University technique using stable isotope analysis, which determined that each was a new and isolated arrival (see also *Exhibit 1).*

In May 2005, the Asian Gypsy Moth was declared eradicated, after only two years – and two months of a response modelled on the PAM Project. That same month, the Wellington Medical School report for the Ministry of Health on the impacts of the spray campaign was published. Media coverage was modest, and the *Sunday* programme focussed on a person said to be suffering ongoing health effects, despite the report's finding of "no significant adverse effects."[2]

> "As predicted in existing research, the most significant health effects were upper respiratory issues, followed by eye, lower respiratory, skin and headache. The symptoms were similar across age and gender. Although the spray programme lasted two years in Auckland and two months in Hamilton, symptoms reported were similar.
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> "The PAM health service cost a total of $11.5 million. From the 193,188 exposed population, there were 27,646 "health service encounters", 1500 of which led to doctor assessments and 136 to specialist assessments. 3636 householders were added to the health register as having health problems that potentially put them at risk."

In 2006, the Waitakere City Council retained Dr Peter Di Marco to review the potential health risk of the Painted Apple Moth eradication programme by aerial spraying of foray 48B, in particular the non-active ingredients, as it was known that some people could be allergic to these (for example eggs and fishmeal). The manufacturers of the spray provided confidential information about the active ingredient to Dr Di Marco. In February 2006, he reported:

> "Foray 48B and its constituents are a low hazard and are not likely to cause adverse effects in people who may come in contact with spray material during or after aerial application....a number of community health concerns have been identified with aerial spraying of Foray 48B in New Zealand and overseas in several studies. These appear to be more closely related to the application method used, ie aerial spraying, and associated adverse media publicity, rather than the Foray 48B itself."[3]

On 20 March, 2006, MAF announced the confirmed eradication of the original infestation of Painted Apple Moth. A day later, a "People's Inquiry" into the effects of the spray began at the Waitakere City Council, with print, radio and television coverage. "Residents gave at-times tearful testimony…One woman said she suffered

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[2] *Biosecurity New Zealand*, issue 62, page 6. (Twice as many - 3.6 percent of the Hamilton population –or 316 people – used the health service over two months, compared with 1.6 percent (697) in Auckland, over two years.)

[3] Benchmark Toxicology Services, Report on Assessment of Health Effects of Aerial Spraying of Foray 48B (Including Assessment of Individual Inert Ingredients), prepared by Dr Peter N Di Marco, Fellow ATS, Submitted to Waitakere City Council, 12 February 2006.

chemical burns, another that she suffered toxic poisoning."[4] The inquiry was being held before four "commissioners" including an anti-pesticides activist from the Philippines, and the hoped-for outcome was recommendations that could go to a Select Committee.

[4] *New Zealand Herald*, 21-03-06, 'Pest gone but public unhappy' and 23-03-06, 'Report dismisses claims of ill health from spraying', both Anne Beston.

Exhibit 1: Stable Isotope Analysis

Stable isotope analysis identifies a unique chemical fingerprint, in much the same way as DNA analysis finds a unique genetic identifier.

This means that chemical components can be analysed to show where they originated, with almost pin-point accuracy.

For instance, the hydrogen component of water has a unique signature depending on where it originates, and this can be traced within the body of an animal that has drunk or absorbed the water.

The caterpillar is the only life stage where the Painted Apple Moth eats. Therefore hydrogen extracted from the wings of an adult moth retains the chemical composition of what it ate and drank as a caterpillar, and stable isotope analysis can indicate where this was.

Dunedin-based company Iso-trace New Zealand approached MAF after hearing of the new painted apple moth discoveries in May 2005, suggesting the then very new technique could be of assistance.

MAF supplied a selection of laboratory-bred moths for the initial trial, and Iso-trace analysed both carbon (from food) and hydrogen (from water) in samples taken from their wing tissue.

Presenting the results, Iso-trace General Manager Tye Husheer said, was a nerve-wracking experience. “We were getting consistent results for the carbon isotopes but two completely different sets of results for the hydrogen.”

To their relief they learnt that the trial moths had been supplied from two different breeding colonies. The stable isotope analysis was showing, correctly, that all the moths were being fed on the same artificial diet, but, also correctly, that the water used to mix it at Mount Albert was completely different from that at Rotorua.

The process, applied to the newly captured moth, showed that there was no connection with any Auckland hydrogen profile. The moths may have emerged from the pupa in Auckland, but the caterpillars had had their last meal in Australia.

Iso-trace is a company ultimately owned by the University of Otago and is currently looking at a multitude of applications for stable isotope analysis. The process became famous for the role it played in tracing the origin of a headless torso found in the River Thames in England, eventually locating the body as from a young boy who had come from a village outside Benin City in Nigeria. Although other analyses were involved, oxygen isotope analysis identified the specific well that was the source of water the boy usually drank.

More information about the process: www.isotrace.co.nz