Search for Red Imported Fire Ants *Solenopsis invicta* Burren (Hymenoptera: Formicidae) in New South Wales, Australia during 2003/2004

B.C. Dominiak[A], **P.S. Gillespie**[B], **M. Kerr**[B], **E.J. Kelly**[C] and **R. McLennan**[D]
[A]NSW Department of Primary Industries, Locked Bag 21, Orange, New South Wales 2800, Australia.
[B]NSW Department of Primary Industries, Orange Agricultural Institute, Forest Road, Orange, New South Wales 2800, Australia.
[C]NSW Department of Primary Industries, PO Box 1, Flemington, New South Wales 2129, Australia.
[D]NSW Department of Primary Industries, PO Box 823, Murwillumbah, New South Wales 2484, Australia.

Abstract
A State-wide search for fire ants was undertaken in New South Wales during 2003/2004. There were 3805 site inspections and samples from the public, resulting in 1471 samples submitted for identification. A public awareness campaign was conducted using a generic brochure, field days and displays, and a toll free telephone number. No fire ants were found in NSW during the year.

Introduction
Red Imported Fire Ants (RIFA) *Solenopsis invicta* (Burren) are a pest primarily of urban environments but also impacts on agriculture. RIFA was first detected in Australia at Brisbane in February 2001 (Mound 2001) and the initial search in New South Wales (February 2001 to June 2003) was reported by Dominiak *et al.* (2005).

Both Federal and State governments agreed to a cost sharing approach to eradicate the pest, and to conduct a national awareness and surveillance program.

Within the Pacific area, there has been increased concern regarding RIFA since their detection in Brisbane in February 2001. In New Zealand, Pascoe (2003) reported the detection and eradication of a RIFA nest at Auckland. Subsequently RIFA were discovered in 2004 in the port of Napier and crazy ants *Anoplolepis gracilipes* (Jerdon) were detected in the port of Wellington (Pascoe 2004). The New Zealand surveillance program aims to detect exotic ant incursions early and to prevent establishment. Glassey (2004) indicated that new training and standards for inspection of sea container had detected three new ant incursions in New Zealand, along with other pests. O'Connor and Boudjelas (2004) noted that RIFA were recognized as a serious biosecurity threat facing all Pacific islands.

Myers *et al.* (1998) reviewed the RIFA eradication activities in America, which despite decades of chemical application and millions of dollars of expenditure, have failed. They strongly recommended the promotion of public awareness as an important part of such eradication campaigns.

This paper summarizes the public awareness and surveillance activities in New South Wales (NSW) between July 2003 and June 2004.

Methods
The methods for the awareness and surveillance in NSW were described by Dominiak *et al.* (2005). All identifications were performed at the Agricultural Scientific Collections Unit (ASCU) of Orange Agricultural Institute (OAI), Orange, NSW. ASCU identification staff were trained to international standards to identify RIFA.

NSW Department of Primary Industries staff performed a risk analysis on likely sites and enterprises. Sites at risk such as ports and shipping container handling facilities, nurseries, landscaping related enterprises, removalists, and other enterprises are detailed in Table 1.

NSW remained divided into three zones for risk analysis purposes as described by Dominiak *et al.* (2005); (1) Sydney was targeted because of the large population base (2) The northern NSW coast is immediately south of Brisbane and therefore closest to the known Australian infestation, and (3) Inland NSW. This year, there was a stronger effort to collect samples from inland NSW.

The NSW RIFA surveillance program comprised two main courses of action. The main approach was to firstly identify

Table 1. Premise types which provided samples or which were inspected between February 2001 and June 2004.

Premise types	Number of sites inspected or providing samples		
	Feb 2001 to June 2003	July 2003 to June 2004	Total
Container depots and port facilities	409	354	763
Bee hives	2	0	2
Brickyards	15	20	35
Timber/building supplies	11	34	45
Commercial	111	111	222
Earth moving	19	12	31
Farm suppliers/farmers	40	9	49
Hardware stores	30	33	63
Landscape related	230	181	531
Nurseries	1,658	1,580	3,238
Parklands	498	324	822
Pest controllers	0	37	37
Removalists	116	124	240
Residences	537	395	932
Roadside/roadworks	47	400	447
Storage	71	42	113
Transport related	73	80	153
Other	97	69	166
Total	3,974	3,805	7,779
Samples sent in by the public	132	63	195
Ant samples sent for identification	1,856	1,471	3,327

the risk sites and activities, and to inspect these sites using departmental or contract inspectors. The second approach was passive surveillance utilizing public contact by means of a toll free phone number established for this purpose. This resulted in ant samples being sent to ASCU by the public, or as a result of inspections by regulatory staff. Apart from the toll free number, public assistance was encouraged by brochures distributed at industry displays, field days and gardening exposés.

Over 100 pest controllers throughout NSW were contacted by phone and requested to send in samples from the next six premises inspected for ant control. A mail-back pack, approved by Australia Post, was developed and mailed to controllers who agreed to send ant samples.

Results

Any ant less than 1 cm in length found as a result of the inspections was sent for identification. Samples were collected from 37% of sites inspected and this remained consistent with the previous year (39.5% as reported by Dominiak *et al.* 2005).

Activities (inspections and samples mailed in by the public) were recorded on standard information or survey forms and these data were entered on a database (summarized in Table 1, Map 1). There were no positive identifications of RIFA in NSW by 30 June 2004 after 3805 inspections and public contacts.

There has been a shift in emphasis on various activities as the NSW program has developed over 41 months of surveillance. In the first 17 months of the NSW program, the main focus was on container facilities (30% of visits) as transport of RIFA by shipping container was regarded as a primary mode of transport. This declined to 3% of visits in 2002/2003, and 9% in this current year. Nurseries made up 30% of visits during the first 17 months, increased to 46.1% in 2002/2003 and to 41.5% in this current survey. Visits to landscape related sites changed from 4%, to 6.5% and 4.5% for the same three periods.

Parklands were recognized as possible sites for land fill where soil contaminated with RIFA could be dumped. The proportion of visits to parklands were >1%, 16.8%, and 10.5% for the same periods mentioned above.

Calls to the RIFA hotline declined progressively and it became difficult to maintain public interest, particularly as no RIFA were detected in NSW. However the general public sent in 63 samples during this period and most of the 395 residences inspected came about after contacts with the public via the hotline or displays.

Dominiak *et al.* (2005) reported that the public contribution remained reasonably constant in absolute terms during the first period but declined proportionally as the level of departmentally initiated inspections increased. Interactions with the public contributed a maximum of 23.5% of all contacts during the first period, only 9.8% of all contacts in 2002/2003 and 10.4% in this current period.

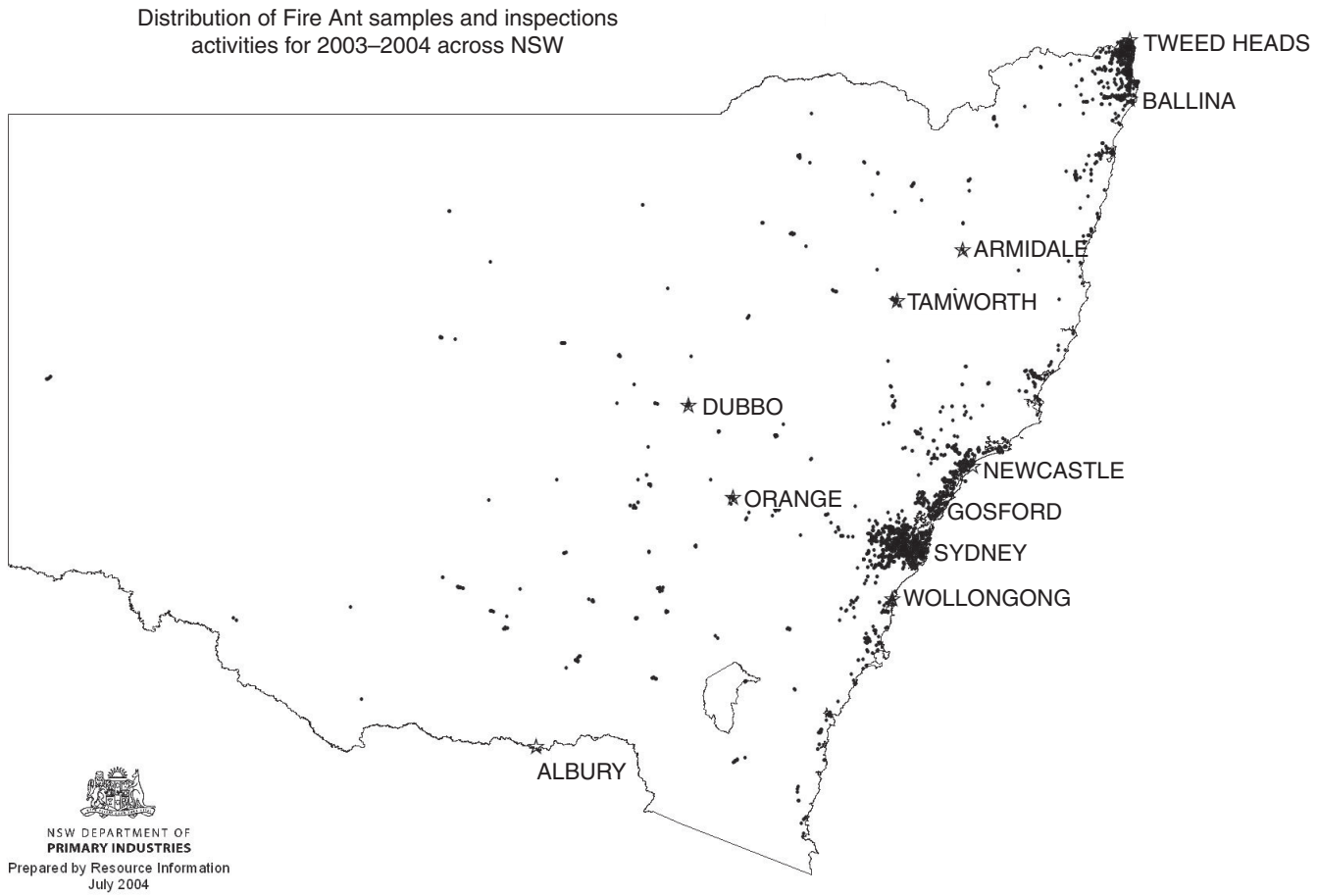
Only 13 pest controllers responded, sending a total of 37 samples in the mail-back packs.

The tempo of inspections increased as the program continued. There were an average of 63 activities per month in the first 17 month period, 241 activities per month in the 2002/2003 year, and 317 activities per month in this current survey.

Discussion

RIFA could still be introduced into NSW from Brisbane, Asia or America. It is encouraging that no RIFA have been found in NSW after 7779 activities in the first 41 months of the five year program.

We have attempted to collect samples by a wider range of methods other than just through field inspections by inspectors or contractors. Samples sent in the mail via mail-back packs cost less than 20% compared with samples collected by



Map 1. Map of New South Wales showing sites visited or from where samples were sent by the public.

scheduled inspections. In the previous survey, bee keepers were contacted and requested to send suspect ant samples for identification. This was particularly poorly supported, probably because the drought had resulted in a down turn in the bee keeping industry. The drought persisted in this year and it was decided not to re-contact this industry. The response from the pest controllers was also disappointing during this current year with only 13 of over 100 responding with ant samples.

Sutherst and Maywald (2005) compared Australia and New Zealand environments with American areas where RIFA have established. New South Wales and most other locations in Australia have a less restrictive climate than their American equivalents. This study showed that RIFA clearly has the potential to establish and impact widely on Australian agriculture and urban environments.

Following the incursions in Brisbane and New Zealand, planning began on the Pacific Ant Prevention Plan to prevent incursions of invasive ant species (O'Connor 2004). Other countries have subsequently studied the Australian and New Zealand campaigns to assist their prevention programs (O'Connor 2005). Ports remain a major concern due to the volume of goods passing via shipping containers. While the eradication program at Fisherman Islands at Brisbane is progressing well, 23 million tonnes of goods passed through that port facility (Geritz 2004). Some of those goods were subsequently shipped to Sydney and there remains a genuine concern that some RIFA may still be transported to Sydney.

Acknowledgments

The NSW program is part of the national public awareness program funded by the National Red Imported Fire Ant Consultative Committee. The assistance of inspectors and the public is gratefully acknowledged. Jennie Staples and Carmen King maintained the RIFA database. Maps were drawn by Angela Thompson. Dr. Murray Fletcher (ASCU) and Dr. Michael Priest provided valuable comments on an earlier version of the manuscript.

References

Dominiak, B.C., Gillespie, P.S., Kerr, M., Kelly, E.J. and Wassell, M. (2005). The search for Red Imported Fire Ants *Solenopsis invicta* Burren (Hymenoptera: Formicidae) in New South Wales. *General and Applied Entomology* 34, 23-7.

Geritz, J. (2004). Port in profile – Fisherman Islands. Australian Quarantine and Inspection Service Bulletin. August-September. p. 9.

Glassey, K. (2004). Container inspection training pays quick dividends. *Biosecurity* 50, 12.

Mound, L.A. (2001). Fire ants invade Australia. *Myrmecia* 37 (2), 11.

O'Connor, S. (2004). Pacific planning to keep ants at bay. *Biosecurity* 49 (1), 7.

O'Connor, S. and Boudjelas, S. (2004). Ants recognised as Pacific's most serious pest threat. *Biosecurity* 52, 15.

O'Connor, S. (2005). Chinese and Hong Kong delegations seek fire ant advice. *Biosecurity* 60, 24.

Myers, H.M., Savoie, A. and van Randen, E. (1998). Eradication and pest management. *Annual Review of Entomology* 43, 471-91.

Pascoe, A. (2003). Red imported fire ant response stood down. *Biosecurity* 45, 7.

Pascoe, A. (2004). Ant surveillance picks up incursions. *Biosecurity* 52, 13-14.

Sutherst, R.W. and Maywald, G. (2005). A climate model of the red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae): implications for invasion of new regions, particularly Oceania. *Environmental Entomology* 43, 317-35.