ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.

NEWS BULLETIN

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The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, and particularly in Queensland. Membership is open to anyone interested in Entomology. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News Bulletin* to members. Meetings are announced in the *News Bulletin*, and are normally held in the Goddard Building, University of Queensland at 7.00 pm on the second Monday of each month (March to June, August to December) each year. Visitors and prospective members are welcome. Membership information can be obtained from the Honorary Secretary, or other office bearers of the Society.

Contributions to the *News Bulletin* such as items of news, trip reports, announcements, etc are welcome and should be sent to the *News Bulletin Editor*.

The Society publishes **THE AUSTRALIAN ENTOMOLOGIST**. This is a refereed, illustrated journal devoted to Entomology in the Australian region, including New Zealand, Papua New Guinea and the islands of the South Western Pacific. The journal is published four parts annually.

EMBLEM: The Society's emblem, chosen in 1973 on the 50th anniversary of the Society, is the king stag beetle, *Phalacrognathus muelleri* (Macleay), family Lucanidae. Its magnificent purple and green colouration make it one of the most attractive of all Australian Coleoptera. It is restricted to the rainforests of Northern Queensland.

COVER: Aboriginal stylised depiction of a biological control agent (*Malacorhinus irregularis*) and its host plant (*Mimosa pigra*) on a background piece of torn bark, by Otto Fahey and Soussanith Nokham.

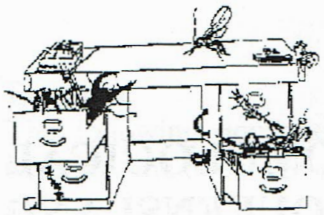

TABLE OF CONTENTS

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The cover design is derived from the logo developed for the XI International Symposium on the Biological Control of Weeds to be held in Canberra in April 2003. See www.ento.csiro.au/weeds2003

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The issue of this document does **NOT** constitute a formal publication for the purposes of the "International Code of Zoological Nomenclature 3rd edition, 1985". Authors alone are responsible for the views expressed.

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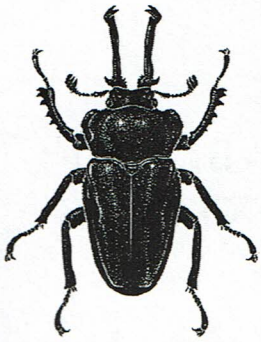

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

MINUTES OF THE GENERAL MEETING: 9 Sept 2002

Held in Room 388, Goddard Building, The University of Queensland, 9 September 2002, 7.00 pm.

Attendance: Bronwen Cribb, Susan Wright, Manon Griffiths, Don Sands, Margaret Schneider, Stuart Mutzig, Sarina Pearce, David Merritt, Bill Crowe, Sarah Russell, Micheal Ramsden, Murdoch De Baar, Rod Eastwood, Ross Kendall, John Nielsen, Michael Sands, Greg Daglish, Stephen Frances, Michael Brown, David Walker, Val Davies.

Visitors: Tanya Russell, Mark Wade, Jack Kennedy.

Apologies: Bill Crowe, Claudina Rodriguez, Tim Heard, Jenny Beard, Chris King, Judy King, John Moss, Andrew Ridley, Cas Vanderwoude, Chris Burwell.

Minutes: The minutes of the last General Meeting, the General Meeting, were circulated in the News Bulletin Vol. 30 Issue 5.

Moved: Don Sands
Seconded: David Merritt

Nominations:
There were no nominations.

Elections:
The following nominations were received at the last General Meeting, and circulated in the News Bulletin Vol. 30 Issue 5.

Seemi Khan
Simon Lawson

The nominees were elected unanimously.

General Business:
Bronwen Cribb raised the issue of a permit for the society that Don Sands has been working so diligently on for the last few years. We already have one permit covering protected taxa and this new permit would cover all National Parks in Queensland. Don then explained that we may need a separate permit to cover State Forests. He also explained that Scientific and Aboriginal National Parks are excluded however these areas are very rare. There will be a statement in an upcoming News Bulletin about the permit and a summary of the conditions covering it.

Main Business: A QUARANTINE THEME

Bill Crowe (AQIS) - "Quarantine Apprehends Dangerous Invaders - a recent account of some major finds in Queensland"
Sarah Russell (AQIS) - "Crocs, Choppers & Wild Goat Stew - a NAQS survey of the Gulf of Carpentaria"
Stuart Mutzig (DPI Fire Ant Control Centre) - "Status of Red Imported Fire Ant Eradication in Brisbane"

Questions:
Q. Nurseries and plant stalls at markets seem to be a risk for the spread of fire ants; are these sorts of places under any management plan?

A. Nurseries not infested are under a management plan with visits every 28 days and markets are regularly visited also.

Q. What about school fetes were plants are brought in from a wide area to be sold?

A.There is a schools education campaign now underway .

Q.How many people are currently working in AQIS in Qld?

A.the number has gone up dramatically over the last 18 months. There are about 2500 people nationally and between 300-400 in Brisbane.

Q. You mentioned that numbers of native ants are increasing relative to the fire ants now that the baiting is underway but what is happening in real terms to the numbers of native ants? Presumably they are taking the baits also so are the numbers actually increasing or are they lower than previously?

A. We don't have any accurate data for numbers before the infestation but not all native ants are taking the baits. Green ants love them but Iridomyrmex, *Camponotus and Crematogaster* for example do not seem to be taking the baits. So the numbers are returning to more 'normal' levels we have no precise data yet.

Vote of thanks:

Bronwen Cribb

Notice of next meeting
Please note the change of date to
MONDAY 7th October, 2002
Greg Courtney

"Mountains, midges, and monsoons: biosystematics of torrenticolous flies"

Bill Crowe
Senior Quarantine Entomologist,
AQIS Queensland
(bill.crowe@affa.gov.au)

Background

I have worked for the Australian Quarantine and Inspection Service (AQIS http://www.affa.gov.au/outputs/quarantine.html) for seven and a half years, five and a half of these as the Queensland Quarantine Entomologist. My primary duties include the identification of arthropods (and some other invertebrate groups) intercepted by quarantine officers on goods being imported into and exported from Queensland. I have been involved in three overseas studies whilst working for AQIS. The first (1997) involved the examination of aircraft disinsection practices in New Zealand. In 1999, I travelled to the USA and Canada to investigate the risks associated with the import of green coniferous timber from North America. More recently (June 2002), I travelled to the USA again as part of an AFFA Development Award, but this time to participate in the Ohio Acarology Program. The Introductory Acarology and Agricultural Acarology courses were held at The Ohio State University, in Columbus Ohio. The courses were intensive, but an extremely important learning exercise for quarantine entomologists given the current World Trade Organisation (WTO) requirement for species level determinations of pests detected on cargo. Within the 3 week timeframe I believe I acquired a greater understanding of mite systematics than I could ever expect to acquire in my current position in Australia in several years. **I highly recommend this program to other entomologists.**

Introduction

Australia has an enviable international reputation for clean, high-quality agricultural exports. Our geographic isolation has provided a natural barrier to the entry of many plant and animal pests and diseases. The increasing speed and frequency of international travel and trade is now starting to placing additional pressure on these barriers.

In 2001, the government decided to further strengthen Australia's already strict quarantine border control to provide additional protection from exotic pests and diseases, such as foot and mouth disease (which we have been free of since 1872). As a result, AQIS received additional government funding to increase border intervention and effectiveness. This funding is mainly being used to put additional infrastructure in place at border inspection locations (e.g. airports and mail centres) so that AQIS can achieve the increased barrier intervention and effectiveness targets that the government has set. These objectives include 100% external container inspections, enhanced international mail screening (primarily using detector dogs and rapiscan technology) as well as significantly enhanced passenger screening at international airports (using detector dogs, rapiscan and improved passenger profiling). AQIS border operations are fully cost recovered via industry fees. All of the quarantine services provided by AQIS are on a fee for service basis. The quarantine policy arm of Agriculture, Forestry and Fisheries Australia (AFFA) and Northern Area Quarantine Strategy (NAQS) are two areas that receive their funding from treasury.

Currently AQIS employees seven full time and three part time entomologists around Australia. The role of a Quarantine Entomologist includes:

identification of intercepted specimens

maintenance of reference collections & culturing of specimens representing AQIS to media, other government departments, industry & community groups
training (AQIS & industry personnel)
treatment & inspection advice
importer/exporter liaison.

Import Volume

Program area	**Approximate import volume (2001)**
Airports	14.3 M passengers (total arrivals)
Seaports	16 814 vessels (total visits)
Mail	500 586 article referrals
Seacargo	3.6 M shipping containers (TEU) Australia wide (00/01) (>6%/year) [Brisbane 481 847 for 01/02]
	390 602 consignment referrals (AIMS entries)
Aircargo	150 404 consignment referrals (AIMS entries)

Almost 14.3 million passengers and crew were processed at international airports in Australia last year. Australian seaports were visited by 16 814 vessels during 2001. Over half a million parcels were presented to AQIS for inspection. This is obviously only a percentage of the total mail volume that enters Australia annually, but the number of quarantine referrals have increased dramatically in the last 12 months. Over 3.6 million shipping containers (twenty foot equivalent units or TEU), were discharged at Australian ports in 2001. This equates to the landing of 10 000 containers (TEU) per day at Australian ports, of which Melbourne and Sydney handle almost three quarters. This was an increase of over six percent from 2000. This doesn't include any break bulk

cargo, such as machinery, timber, yachts etc. From this cargo, 390 602 consignments were referred to AQIS for some sort of processing (either documentation or inspection). There were 150 404 such referrals to AQIS from aircargo during 2001.

Quarantine Interceptions

In the calendar year 2000, 3955 interceptions were received in Queensland, resulting in 6650 identifications being made. In the calendar year 2001, 4054 interceptions were received resulting in 6997 identifications being made.

Queensland 2001	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Totals
Interceptions	360	267	286	251	343	335	407	336	339	405	384	341	**4054**
Identifications	660	435	460	417	608	570	722	625	557	717	674	552	**6997**

Nationally 22 480 pest & pathogen identifications were made. Of these 15 091 were either exotic or of unknown status in Australia. Several of the more notable interceptions that have occurred during the past 18 months are :-

Specimen	Common name	No. of interceptions
Coleoptera		
Arhopalus ferus	**burnt pine beetle**	**7**
Dinoderus bifoveolatus	false powderpost beetles	12
Heterobostrychus aequalis	lesser auger beetle	27
Heterobostrychus brunneus	boxwood borer	2
Hypothenemus hampei	coffee berry borer	2
Lyctoxylon japonum	powderpost beetles	4
Lyctus africanus	powderpost beetles	3
Minthea reticulata	powderpost beetles	4
Monochamus alternatus	**Japanese pine sawyer**	**1**
Sinoxylon conigerum	auger beetles	23
Stephanopachys amplus	auger beetles	1
Stromatium barbatum	drywood longicorns	2
***Trogoderma* spp.**	**khapra beetle etc.**	**12**
Diptera		
Aedes albopictus	**Asian tiger mosquito**	**3**
Bactrocera zonata	**peach fruit fly**	**1**
Ceritits spp.	fruit flies	2
Tephritidae (Indet.)	fruit flies	3
Hymenoptera		
Anoploleps gracilipes	**crazy ant**	**29**
Apis cerana	**Asian honeybee**	**1**
Apis dorsata	**giant honeybee**	**3**
Bombus terrestris	bumble bees	1
Camponotus modoc	carpenter ants	4
Solenopsis geminata	**tropical fire ant**	**10**
Wasmannia auropuctata	**little fire ant**	**7**
Isoptera		
Coptotermes formosanus	**Formosan termite**	**1**
Incisitermes minor	**Western drywood termite**	**1**
Zootermopsis angusticollis	Pacific dampwood termite	2

Specimen	Common name	No. of interceptions
Lepidoptera		
Lymantria dispar	**Asian gypsy moth**	**1**
Thysanoptera		
Caliothrips fasciatus	bean thrips	9
Thrips major	rose thrips	3
Thrips obscuratus	New Zealand flower thrips	2
Acari		
Tenuipalpus ?pacificus	phalaenopsis mite	5
Araneida		
Latrodectus mactans	black widow spider	5
Gastropoda		
Achatina fulica	**giant African snail**	**32**
Pomacea canaliculata	golden apple snail	20
Other		
Bufo melanostictus	black spined toad	3
Pica pica	black billed magpie	1

Low grade wooden dunnage continues to produce a number of important quarantine detections. The main offenders this year have been *Heterobostrychus aequalis*, *Sinoxylon conigerum* and *Monochamus alternatus*. The detection of Japanese pine sawyer (*Monochamus alternatus*) in the pallets of a consignment of ammonium nitrate (used as an explosive when mixed with diesel) was the most concerning. The consignment in question was imported from China. In China and Japan, this species is responsible for the transmission of the pinewood nematode (*Bursaphelenchus xylophilus*), a serious forestry pest exotic to Australia.

Khapra beetle (*Trogoderma granarium*) is considered the world's worst stored product pest. This pest is now widespread around the

world but remains exotic to Australia. The larvae are long lived and very resilient; able to live in cracks in concrete etc. for several years without feeding (in diapause). The cast skins are usually the first sign of infestation and can usually be seen in large numbers when a heavy infestation of khapra is detected. Khapra is commonly intercepted in ships stores, ears of bags, even cardboard boxes and has been found on at least five times at Brisbane airport alone in the last few years. Warehouse beetle (*Trogoderma variabile*) was first detected in NSW in 1977. An eradication campaign was attempted but it was abandoned in 1980. It has now been found in Victoria, SA, and WA as well. AQIS requires mandatory treatments for high risk commodities (known regular hosts) from known khapra countries and trapping is conducted at high risk premises.

Asian tiger mosquito (*Aedes albopictus*) larvae were detected on three occasions during 2001. They were found in machinery from Indonesia, metal from PNG and the deck of a ship from PNG. *Ae. albopictus* is a container breeder with drought resistant eggs that hatch when next flooded. It is an efficient vector of dengue, JE and many other disease of human and/or animal significance. In the last 20 or so years the Asian tiger has spread throughout the world (e.g. USA). Recent experience has shown high risk cargo to include, tyres, nursery stock (e.g. *Dracaena* cuttings), machinery and yachts. The yellow fever mosquito (*Ae. aegypti*) is also regularly intercepted at the quarantine border. AQIS conducts vector monitoring within 400 meters of all first ports of call using surveillance (habitat & cargo) & trapping (e.g. ovitraps & sentinel tyres).

Fruit fly larvae were detected in some unidentified tropical fruit (thought to be hog plum) at the airport in Brisbane. The samples were forwarded to CSIRO for DNA sequencing after morphological characters were inconclusive. The larvae were identified as the exotic peach fruit fly (*Bactrocera zonata*) which closest known distribution to Australia is Thailand. Fortunately

the QDPI maintains a five kilometre grid of methyl eugenol fruit fly traps in the airport precinct and these are cleared and the contents identified on a two-week cycle. No peach fruit fly have been found in these traps since the fruit was first intercepted. The QDPI trapping grid in the airport precinct continues to be maintained, and as a precaution, two extra methyl eugenol traps were installed, one adjacent to the old international terminal and another in a small low-chill stone fruit orchard at Myrtletown (about 2 km away).

Giant honey bee (*Apis dorsata*) has been intercepted from Malaysia on three occasions in recent years. Twice on aircargo pallets & once on a shipping container. This bee is a vector of *Tropilaelaps clareae* a serious exotic bee parasite. Asian honey bee (*Apis cerana*) has been intercepted on machinery & a ships crane on three occasions in recent years. This bee is a vector of *Varroa destructor*, another serious exotic bee parasite (now in NZ). A live bumble bee was recently discovered in the hold of a vessel by a stevedore at Conaust Wharf (Fisherman Island). The bee was captured in packs of kiln dried NZ pine. The bee was identified as *Bombus terrestris*. *B. terrestris* is present in NZ and Tasmania. In Brisbane a thorough inspection of the discharged packs of timber was conducted (all the plastic wrap etc. was opened) revealing no further specimens.

Interceptions of ants hit an all time high in Queensland recently, with most weekly reports including at least one ant story. Little fire ant (*Wasmannia auropunctata*) has been intercepted at the international airport seven times since January 2001. Interceptions have mostly been from woven mats and baskets from the Solomon Islands and New Caledonia. These ants are tiny (1.5mm), pale orange, and are characteristically slow moving. They produce painful stings and large red welts and the after effects of the stings are reported to last for several days. This ant has managed to spread very successfully around the world (including Africa,

central and northern South America, the West Indies, Mexico, USA (Florida, California), Hawaii, New Caledonia, the Solomon Islands and an unconfirmed report from PNG. For more information please see the attached hyperlink http://www.hawaiiag.org/hdoa/npa/npa99-02_lfireant.pdf. This ant has the potential to be as serious a pest as RIFA (Red Imported Fire Ant – *Solenopsis invicta*). Crazy ants (*Anoplolepis gracilipes*) were detected on 29 separate occasions since January 2001. Most of the interceptions have been from shipping containers, but machinery and timber have also been involved. Tropical fire ant or ginger ant (*Solenosis geminata*) have been identified at the Brisbane airport on several occasions over the past 18 months. These are an introduced pest species in the Northern Territory. They are similar in appearance to the Red Imported Fire Ant (RIFA) (*Solenopsis invicta*), however display less aggressive behaviour when disturbed and workers lack a medial clypeal tooth and the biggest major workers have bilobed heads.

Brisbane quarantine officers recently encountered one of the worst insect infestations they'd ever seen, when a *Sea Ranger 65* motor yacht arrived as breakbulk cargo from China. A thorough investigation of the vessel revealed that the infestation was widespread throughout - with damage in the flybridge, foredeck, engine room, side rails & gates, floors, beds, cupboards, hoodlinings, mouldings, and trims of upper & lower decks. A sample of the termites was collected and identified (and later confirmed by entomologists at NSW Forestry) as *Coptotermes formosanus* - an exotic, extremely destructive subterranean termite. The extent of the damage as well as the large number of dead alates (winged reproductives) and shed wings (old) found throughout the vessel suggested that it was a long term infestation - probably several years old. Realising the extent of the infestation, all windows, doors and other access points were sealed up immediately. The yacht was ordered in for a CH_3Br

fumigation. It was thoroughly inspected post-fumigation – and fortunately no sign of live termites was found.

During the re-inspection, the full extent of the infestation was realized. Massive numbers of dead termites, with an inordinate ratio of soldiers to workers and immature alates, were revealed in the flooring of the upper deck, the hood linings of the hallway and wall panelling of the crew cabin. Numbers of termites were so high that specimens were collected with a dustpan and brush! The genus *Coptotermes* contains the largest number of termite pests (28 species) of which *Coptotermes formosanus* is the most widely distributed and economically important and is considered the most destructive subterranean termite in the world. This same species has also been detected infesting vessels in Fremantle on two occasions in recent times. Though a subterranean species, *C. formosanus* can successfully establish a colony with no ground connection making them suitable candidates for infesting yachts. Colonies reach substantial numbers within three to five years and can produce over 70,000 alates. In severe infestations, the termites hollow out the timber, leaving a paper-thin surface which may appear blistered or peeled.

Incisitermes minor (Western drywood termite) was recently discovered in a yacht that had been sailed in from the USA. The infestation was reported when termite damage was discovered in a seat locker in the yacht's cockpit. The owner had built the yacht himself approximately 25 years ago and had lived on board ever since without any knowledge that his pride and joy was slowly being eaten away by drywood termites. The yacht was ordered into quarantine for treatment.

In February this year, an Asian gypsy moth (*Lymantria dispar*) egg mass was intercepted on a bulldozer from Japan. The eggs were hatched in the AQIS quarantine insectary and the larvae were fed on eucalypt leaves from the front garden. Almost all were

successfully reared through to adults. AGM is of Eurasian origin but has become widespread around the world. High risk pathways include, ships, containers, cars, machinery & various cargoes. The AGM is a serious pest species. Its caterpillars are known to feed on the leaves of up to 600 species of trees and it is responsible for significant damage to commercial and horticultural trees. The biology of AGM, in particular the indiscriminate nature with which eggs are laid on surfaces including machinery, vehicles, ships' structures and containers has aided in the spread of AGM throughout the world. Female AGMs are capable of flying up to 40 kilometres, which also increases the likelihood of their spread and distribution. Newly hatched larvae can survive one week without feeding and they are also capable of spinning silken threads enabling them to travel long distances by ballooning on the wind. See AGM for more information. AGM trapping is conducted around high risk ports (by QFRI in Queensland).

Giant African Snail (GAS) (*Achatina fulica*) is a serious pests of more than 500 plant species. The shells can be up to 200 mm long when fully mature. It has spread around the world very successfully. GAS was detected at Gordonvale in 1977 but was quickly eradicated. Shipping containers, crates, pallets, plant material & even passengers, are high risk pathways. Cargo from high risk ports is specifically targetted and must be salted until a GAS inspection is completed. Baiting is also conducted around wharves and cargo depots. GAS was intercepted on 32 separate occasions in Queensland (mainly in Brisbane) since January 2001. Most interceptions were from shipping containers originating from PNG.

Other News

2001 saw the opening of the new quarantine building at Brisbane Airport. The new facility includes high security quarantine plant pathology laboratories (C3) and a maximum security quarantine

insectary. The quarantine insectary has already proved it's worth with a number of important quarantine pests having been reared through so far. These include:
exotic auger beetles (*Xylionulus pusillus*) from a wooden giraffe ex Zimbabwe. This species appears to be common in African artefacts with several previous detections now confirmed to be this species
Rhyncolus brunneus from Canadian Western redcedar lumber
Asemum striatum from Canadian Douglas-fir lumber
Monochamus alternatus from Chinese dunnage (as below) – five specimens were reared through in total
Stromatium barbatum from cricket bats ex Pakistan
Bactrocera cucumis from Australian rock melons
Isotenes miserana from Australian blueberries – on two occasions
Epiphyas postvittana from NZ apricots
Asian paper wasps (*Polistes chinensis antennalis*) were successfully reared from a nest that was discovered in a crate arriving via airfreight from the USA. Asian paper wasp is present in NSW but as yet has not been verified from any other states
Asian gypsy moth (*Lymantria dispar*) from an egg mass on a bulldozer from Japan
Numerous noctuid moths (mainly *Helicoverpa* spp. and *Spodoptera* spp.) intercepted as caterpillars on Thai asparagus
Current inmates include a *Stromatium* larva in a cricket stump from Pakistan; and some Italian longicorn larvae (likely to be *Neoclytus acuminatus* and/or *Xylotrechus stebbingi*) intercepted from branches included with artificial trees.

Last year saw another SE Asian timber pest establishment for Australia. *Chlorophorus annularis*, a previously exotic longicorn that is regularly detected in range of wooden ware from SE Asia (particularly bamboo garden stakes etc. from China) was found infesting stands of local bamboo around Brisbane. It now appears that the infestation is widespread.

Hitchhikers

Hitchhikers are generally categorised as organisms carried or transported by chance, i.e. unintentionally. Major economic pests are regularly intercepted at quarantine borders around the world, hitchhiking on a variety of goods. The presence of such pests is usually difficult to detect and even harder to predict. Nevertheless, quarantine authorities world-wide are continually searching for better methods of detection, prevention and/or treatment of hitchhikers. At Australian borders, AQIS regularly intercepts many serious economic pests of plants and animals, including humans. In the following paper I will attempt to highlight some of important hitchhikers that are intercepted in quarantine and provide some possible solutions to their detection, prevention and control.

The majority of insects intercepted hitchhiking on goods entering Australia are stored product pests, such as flour beetles, weevils, grain beetles etc. Most of these are intercepted in empty shipping containers which contain some form of residue from a previous consignment. The majority of species are now considered to be cosmopolitan in distribution, but the question of pesticide resistant strains still concerns some scientists. However, there are a significant number of other plant and animal pests intercepted hitchhiking on a wide range of goods each year. There have been over 5,500 invertebrates (mainly insects and snails) found hitchhiking on non-plant products by AQIS since 1995 (current at 1/12/00 - source: AQIS Pest and Disease Interception Database). Whilst many of these are considered to be of a low quarantine risk, there are some serious pests. Several of the more notable non-plant hitchhiker interceptions have been:

Pest	Origin	Commodity	Method of import
Lymantria dispar	Japan	Vehicle	Sea

Pest	Origin	Commodity	Method of import
			Cargo
Camponotus pennsylvanicus	USA	Building material	Sea Cargo
Hoplocerambyx severus	PNG	Machinery unit	Sea Cargo
Sinoxylon conigerum	Taiwan	Cardboard box	LCL container
Heterobostrychus aequalis	Indonesia	Paper	Air baggage
Arhopalus ferus	New Zealand	Ship deck	Sea cargo
Coptotermes formosanus	Taiwan	Toys	Sea baggage
Urocerus gigas	Italy	Cardboard	FCL container
Oryctes rhinoceros	Thailand	Styrofoam box	Air cargo
Achatina fulica	PNG	Empty container	Sea cargo
Pomacea canaliculata	PNG	Empty container	Sea cargo
Apis cerana	PNG	Ship crane	Sea cargo
Apis dorsata	Malaysia	Machinery parts	Air cargo
Bombus lapidarius	Czechoslovakia	Machinery	FCL container
Trogoderma granarium	Iran	Wind chimes	Air baggage
Polistes chinensis	Japan	Vehicle	Sea cargo
Polistes olivaceus	PNG	Machinery	Sea cargo
Vespula pennsylvanica	USA	Pipes	FCL container

Pest	Origin	Commodity	Method of import
Aedes albopictus	Solomon Islands	Machinery	Sea cargo
Aedes aegypti	China	Steel frames	Sea cargo

The risks associated with these pests varies and depends on a number factors including, relative numbers found, availability of suitable host material at the point of discharge, their stage of development and their condition. These factors are in turn influenced by variables, such as host commodity and the method of import. For example, those found hitchhiking on, or in goods imported by airfreight are likely to be in better condition due to their short transit time.

Shipping containers provide an ideal method of transport for many hitchhiking pests as two surveys, conducted in Australia and New Zealand, have recently found. Pathogenic species of *Fusarium* (a fungus found in soil) and two Asian gypsy moth (AGM) (*Lymantria dispar* egg masses were among the quarantinable contaminants detected during the New Zealand external container survey (Gadgil et. al. 1999, *unpublished data*). The survey concluded that between 10% and 68% (depending on origin) of containers carried quarantinable contaminants on the outside surfaces. Another survey, conducted by the University of Queensland (Stanaway, et. al. 1996, *unpublished data*), concentrated on the internal examination of containers. 7966 insects were found in 1166 (39%) of the 3001 containers examined. The more notable detections included sirex wasps (*Sirex juvencus* and *Urocerus gigas*), musk beetles (*Aromia moschata*), several different species of exotic auger beetles (e.g. *Heterobostrychus aequalis*). Exotic ants, scarab beetles, bees, and

moths were also detected. The survey concluded that shipping containers were a high risk method of introducing exotic pests.

Asian gypsy moth is arguably the number one forestry pest likely to enter Australia. The egg masses (Figure 1) are regularly found by New Zealand quarantine authorities on cars from Japan (66 egg masses found in 1999; 15 of them viable), ships (8 egg masses on ships ex. Russia in 1996) and containers (79 egg masses (19 viable) since 1996). Other interesting items which AGM has been intercepted from include used tyres, a pallet of ceramic glaze and a lawn mower (Ken Glassey, *personal communication*). Other hitchhiking forestry pests intercepted by quarantine include, white spotted tussock moth (*Orgyia thyellina*), termites (e.g. in cardboard boxes), burnt pine longhorn beetle (*Arhopalus ferus*) (e.g. on ships, paper etc.), auger beetles (e.g. in paper) and the Monterey pine aphid (*Essigella californica*)- found in cardboard boxes of avocadoes from New Zealand).

Shipping containers also provide a transportation medium for many different species of snails, some of which are exotic pests of agricultural significance. Giant African snail (*Achatina fulica*) is regularly intercepted hitching a ride on containers, machinery, decks of ships etc. Since 1995 it has been intercepted on 227 occasions (mostly on the outsides of containers) (current at 1/12/00 - source: AQIS Pest and Disease Interception Database). Many of these interceptions included numerous specimens. Recently in Gladstone (Queensland) in excess of 120 snails were detected on a container vessel from PNG. Golden apple snail (*Pomacea canaliculata*) is another pest species that is also regularly intercepted on containers. Live aestivating snails are also collected by air passengers for inclusion in shell collections.

Ships also provide a popular mode of transport for many hitchhikers that trip around the world. Some of the more important hitchhikers include, AGM, honey bees (e.g. *Apis cerana*, *A.*

dorsata and *A. mellifera*, vectors of devastating parasitic bee mites and burnt pine longhorn beetle (*Arhopalus ferus*). Burnt pine longhorn is regularly intercepted from New Zealand on a variety of different goods (ship decks, paper, timber etc.) during its summer flight season. During the summer months, Australia now demands a mandatory pre-shipment fumigation of all timber from New Zealand ports where the beetle is found to occur.

Aircraft disinsection procedures appear to take care of many of the insects that blunder into aircraft holds during loading, but some have been found alive when inspections are conducted in Australia and New Zealand. In Brisbane recently, giant honey bee (*Apis dorsata*) was found on top of a shrink wrapped pallet of machinery parts from Malaysia. Asiatic rhino beetle (*Oryctes rhinoceros*), a serious pests of palms, has been found alive in an aircraft hold and also in a styrofoam box containing tissue culture flasks from South East Asia.

Other interesting finds of hitchhiking insects include, mosquitoes (*Aedes albopictus* and *Ae. aegypti* as resistant eggs on machinery), khapra beetle (*Trogoderma granarium* - in cardboard boxes, hessian bags etc.), paper wasps and yellow jackets (on machinery etc.) and lesser auger beetle (*Heterobostrychus aequalis*) (found in a cardboard box containing a chocolate cake).

A number of strategies may be employed to counteract the risks posed by hitchhikers. These include:

Increased public awareness - quarantine authorities are unable to check all cargo, so we must educate freight handlers, stevedores and the general public to recognise the major quarantine pests and report them accordingly. Hitchhikers are regularly found on goods not normally subject to quarantine (e.g. new computers in cardboard boxes). Posters, leaflets, field guides (e.g. Forests & Timber - a guide to exotic pests and diseases) are a great way of getting the quarantine message across. This process may be taken one step further to incorporate co-regulation activities, where

industry groups can become accredited under a quality assurance arrangement to inspect certain products on behalf of quarantine authorities.

Targeted inspection and surveillance efforts - concentrate our efforts on proven pest pathways (i.e. high risk cargo from high risk origins). This would include trapping and surveillance systems around ports for high risk pests and pathogens (e.g. in Australia we conduct port surveillance for bees, AGM, snails, mosquitoes, culicoides, and screw worm fly (*Chrysomia bezziana*).

Pre-shipment or on arrival treatments for high risk goods - in Australia we now require mandatory permethrin treatment of machinery capable of holding water from East Timor. AQIS also requires that timber from New Zealand be fumigated during the flight season of burnt pine longhorn beetle. Aircraft disinsection is another example of a treatment that is employed to mitigate a known hitchhiker risk.

Crocs, Choppers & Wild Goat Stew.....

A NAQS survey of the Gulf of Carpentaria 2001

Sarah Russell - Quarantine Entomologist

Abstract

NAQS (Northern Australia Quarantine Strategy) is designed to protect Australia from incursions of exotic pests, weeds and diseases present in countries to our north. This is achieved through the interaction of three sub-programs within the organisation- scientific, operations and public awareness (see the attached hyperlink for more information http://www.aqis.gov.au/naqs).

In August 2001 a survey for exotic plant and animal pests, diseases and weeds was conducted in coastal and subcoastal areas of the Gulf of Carpentaria between the NT-QLD border, Sites surveyed included the Limmen Bight River, the town of Borroloola & the Sir Edward Pellew Islands as well as surrounding cattle stations across to Wollogorang Homestead on the QLD border. A total of 56 specimens were identified from 39 host samples none of which were of quarantine concern.

Introduction

NAQS is a program with the Australian Quarantine and Inspection Service and was established in 1989 after the Lindsay Report identified a need for a national strategy for northern Australia

(from Broome to Cairns). The quarantine challenges affecting this region are a result of its proximity to countries with a different animal and plant health profile. NAQS provides an early detection and warning system of new pests through a program of monitoring, surveillance and public awareness across northern Australia and in neighbouring countries.

The area covered during this field trip was previously surveyed in June 1999, however, was this was the first time the Sir Edward Pellew group of islands was surveyed under the NAQS auspices. The purpose of the study was to survey the coastal and sub-coastal areas of the Gulf of Carpentaria between the NT – QLD border for exotic plant and animal pests, diseases and weeds (including veterinary, plant pathology/botany and entomology components).

Much of the land in the area is under pastoral lease although there are pockets of aboriginal land. The recently established McArthur River mine, a subsidiary of Mount Isa Mines, is located approximately 70km from the port at Bing Bong. The town of Borroloola, located about 50km from the coast, supports a population of about 800. There are 8 pastoral properties along the coast but only 5 of these are currently inhabited. There is no commercial horticulture in the area.

Entomology objectives

1. Survey a representative number of sites containing commercial plant species in the area for the presence of exotic plant pests.
2. Document the occurrence and pest status of commercial species of plants in the survey area.

3. Enhance quarantine awareness amongst inhabitants of the survey area.

Methods

This survey was conducted over a large area including the NT Gulf of Carpentaria coastline and communities from the Limmen Bight River across to the Queensland border and including Boroloola and the Sir Edward Pellew Group of islands. A variety of sites were sampled and when present, people living at these sites were asked about the health of their plants and their awareness of quarantine issues. Where possible, advice on particular plant health problems being experienced was given along with a brief outline of NAQS and the role of the public and producers in the program.

At each site, a representative number of commercial plant species present were examined for plant pests and diseases. In the absence of commercial plant species, native species belonging to the same botanical family or preferably, genus, as the commercial species were examined in the same manner.

Insects causing, or suspected of causing, obvious damage to host plants were collected using a variety of methods including sweep netting, aspiration and collection by hand. Fruit fly and culicoides trapping was also conducted during the survey. Flowers were examined for the presence of honeybees and when present fruits (mainly mangoes and native figs) were sampled and examined for insect activity.

Insects of potential human health importance were also sampled either by dipping, examining potential breeding sites (artificial containers) or using live bait (i.e. specimens caught alighting on human candidates). Other biting insects were collected opportunistically.

The majority of specimens were collected into 70% ethanol. Where possible, immature stages were collected live into sealed plastic bags with sufficient host material to allow these insects to complete their life cycle.

Results

A total of 56 specimens were identified from 39 host samples. Identification of specimens collected from the fruit fly and culicoides traps were made by NAQS entomologist Glenn Bellis. Identification of the other specimens were carried out primarily by Sarah Russell with assistance from Graham Brown (NT DPIF), Glenn Bellis (NAQS), Jenny Beard (UQ) and Bill Crowe (AQIS). Every effort was made to identify specimens to the highest taxonomic level possible, however, some identifications remain incomplete but none are likely to be of quarantine significance.

Table 1: Summary of taxonomic levels of identification achieved.

Taxonomic level	Number identified
Orders	9
Families	28
Genera	30
Species	24

Table 2: Summary of agriculturally significant species collected from commercial hosts.

Site	Host	Organism
Limmen Bight	Cashew	*Helopeltis pernicialis* tea mosquito bug
	Mango	*Ceroplastes rubens* pink wax scale *Amblyseius annae* mite
Charlie's Camp	Citrus	*Phyllocnistus diaugella* leafminer *Aonidiella aurantii* red scale *Haplothrips gowdeyi* goldtipped tubular thrips *Amblyseius largoensis* mite
Borroloola	Mango	*Icerya seychellarum* mealybug *Selenothrips rubroscinctus* redbanded thrips *Thrips imaginis* plague thrips
	Beans	*Ophiomyia phaseoli* bean fly

Discussion

A few insect species of agricultural importance were collected during the survey (see Table 2), although their abundance and damage to host plants were generally recorded as low. The tea mosquito bug, *Helopeltis pernicialis*, was collected from cashews (*Anarcardium occidentale*). This insect has been the subject of research projects assessing its effect on cashew plantations in the Northern Territory and indications are that it is capable of drastically reducing cashew nut yields. Despite the presence of

this insect there was little evidence of damage to growing tips of the plant.

Table 3: Summary of species of human health importance.

Site	Host	Organism
Limmen Bight	Human	*Anopheles hilli*
Nathan River Station	Human	*Anopheles bancroftii*
Manangoora	44 gallon drum	*Culex quinquefasciatus* *Ochlerotatus notoscriptus*
Vanderlin Island	Dog	*Rhipicephalus sanguineus*
Centre Island	Plastic water drum	*Ochlerotatus notoscriptus*
North Island	Saucepan	*Ochlerotatus notoscriptus*
Foelsche river	Human	*Tabanus pallipennis*

Scale insects were collected from a variety of hosts including mango, citrus and cycads (see Table 2). *Ceroplastes rubens* (pink wax scale) was particularly abundant on a stand of cycads growing at Manangoora station and did appear to be affecting the vigour of the plants. These scales have a wide host range and are often found in association with a coating of sooty mould which can inhibit plant growth further.

Insects recorded from mango trees sampled, included mealybugs, thrips, planthoppers, weevils etc. The majority of trees had

developing fruit crops and though immature, a number of fruits were cut open for inspection for internally feeding pests, however, none were recorded during this survey.

The sampling of insects of human health importance (e.g. mosquitoes) was mostly done opportunistically however, artificial containers holding water, particularly in association with human habitation, were actively sampled. No species of quarantine concern were recorded.

Observations during the survey indicated that for the majority of sites visited, the insect abundance was relatively low, and this was most likely attributed to the time of year (dry season conditions prevailed). None of the specimens identified were of quarantine concern.

In summary, the area surveyed is becoming increasingly popular with 4WD holidaymakers and fishing enthusiasts and tourism can only continue to increase. The advantages of conducting surveys in this region not only provides an early warning detection system for exotic plant and animal pests and diseases, but provides valuable data documenting organisms present in the area and creating a benchmark for future reference.

Monitoring the eradication of the Red Imported Fire Ant (*Solenopsis invicta* Buren) in Brisbane, Australia.

Stuart Mutzig
Department of Primary Industries, Fire Ant Control Centre, Wacol, Qld, 4076.

The Red Imported Fire Ant *Solenopsis invicta* Buren, was first discovered in Brisbane in February 2001. Its status as an agricultural pest resulted in Queensland's Department of Primary Industries undertaking a 3 year eradication program. A monitoring program was established to assess the effectiveness of the eradication regime. Monitoring comprises three key tasks: pitfall trapping; nest mapping and surveying infested properties.

The monitoring program has been designed to account for: areas of variable ant densities (high, moderate, low); different land uses (e.g. parkland, industrial, residential); and varying degrees of public accessibility and disturbance. Sixty-four sites are currently being monitored in the Brisbane metropolitan area. All sites have been established in known fire ant infested areas.

The monitoring program is designed to assess fire ant numbers and the effect of treatment. While ant studies are common, no other country has ever undertaken the task of eradicating the Red Imported Fire Ant (RIFA). There are no similar studies available for comparison, hence the programme was developed with little background knowledge of the benefits and shortcomings of such a task.

Pitfall trapping is a standard technique used to monitor ant foraging activity. The pitfall traps used in this project consisted of

test tubes set in permanent PVC sleeves. The sleeves were made from electrical conduit, cut to length and hammered into the ground with a metal spike. Pitfalls were spaced evenly at approximately 4-5 metres through each plot. Fewer traps were established at low density areas (eg one nest only), compared to higher density sites. The traps were primed with 4 ml ethanol (70:30 with water) to which a small amount of glycerol was added to reduce evaporation and surface tension. A standard open period of 72 hours was employed on a monthly basis over the warmer months.

Each monitoring site was also assessed in terms of the number of nests, and size and activity level of each nest present. Sites were surveyed and nests mapped on a grid, three times per treatment season (pre-season, mid-season and end-season). Nest activity was gauged by penetrating each nest with a steel wire 5 times to a depth of 10cm. A rating was allocated according to the number of ants that respond to this disturbance:
0 = no activity; indicative of a dead colony,
1= 1-5 ants; interpreted as low vigour,
2= 6-50 ants; interpreted as moderate vigour, and
3= >50 ants; interpreted as very active - indicative of a normal colony.

At each assessment the plots were re-mapped and the relative vigour of each nest re-estimated.

The third monitoring technique involved a visual survey of each known infested property. This task aimed to establish the current levels of fire ant infestation. To May 2002, 752 properties were recorded as being infested. The survey is still in progress. Results for 70% of the properties are shown below.

Pitfall data shows between 98% and 70% control achieved within the first year of treatment. The higher of these two results applies

to high density infestations (>500 nests/ha), and the other to low density infestations (<100 nests/ha). The reason for this disparate result is unclear, although likely to be due to competition for the bait. Where RIFA exist in high densities, numbers of native ant species are significantly reduced or absent. In these circumstances most, if not all, of the bait is consumed by the fire ants. In lower density scenarios, fire ants compete for the bait with the more abundant native ants.

Pitfall trapping data also shows the rapid return of native ant species to previously infested areas, at above expected rates.

By the end of the first treatment season (May), nest mapping results show 90% of nests at monitoring sites to be inactive. The remaining 10% of nests are divided up evenly amongst those showing low levels of activity, through to nests displaying high levels of activity.

By August 2002, 523 of 752 infested properties had been surveyed. 350 (68%) of these properties were seen to be free of active fire ant nests. A further 30% of properties had only between 1 and 5 nests.

These three monitoring techniques used together provide a broad and thorough validation system for the eradication program. Each technique alone tells of a different success rate for the eradication campaign. When combined they show a consistent rate of success – the ants are being controlled at a rate in line with predictive models, and 100% eradication within three years is still an achievable target.

Notice of next meeting
Please note the change of date to
MONDAY 7th October, 2002
Greg Courtney

"Mountains, midges, and monsoons: biosystematics of torrenticolous flies"

News from the Alan Fletcher Research Station

Graham Donnelly visited the ACIAR chromolaena biocontrol project in Lae PNG from 19 to 23 August and met with **Warea Orapa** and **Ingu Bofeng.** While there Graham assisted in the release of the chromolaena gallfly *Cecidochares connexa* in the Markham Valley. Warea has resigned his position or Weed Biocontrol Scientist with the PNG National Agricultural Research Institute (NARI) to take up a position of Weed Extensionist with the South Pacific Commission in Suva. NARI Entomologist **Sim Sar** will act as project leader following Warea's Departure.

Nomination for membership of the Entomological Society of Queensland

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(mail to: Dr Greg Daglish, Dept of Entomology, Department of Primary Industries, Indooroopilly 4068)

The email version of the Bulletin

The Bulletin will be available by email for the remainder of the year to anyone who requests it. I stress that this would be an additional option and the hard copy version of the Bulletin will still be available to those who wish to continue receiving it.

Please contact me on (07) 33102810 or Cas.Vanderwoude@dpi.qld.gov.au to be added to the email distribution list.

Cas Vanderwoude
(Editor)

download the latest version of Adobe reader (free) at
http://www.adobe.com/products/acrobat/readstep2.html

Corrections to contact details on back cover

Please note that the following changes to contact details of Society office bearers:

Dr Tim Heard's correct telephone number is (07) 3214 2843

Dr Jenny Beard's correct telephone number is (07) 33657085
e-mail J.Beard@zen.uq.edu.au

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With the departure of Dr Heather Proctor for Canada, Dr Manon Griffiths has kindly agreed to assist the committee at monthly meetings. Her contact details are:

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Ordinary $33 pa ($30 if paid by AGM)
Country $30 pa ($27 if paid by AGM)

ASSOCIATE: Students and others at the discretion of the Society Council, $18 pa ($15 if paid by the AGM). Associate membership conveys full membership privileges, except the right to vote on the conduct of affairs of the Society, to hold office and to nominate new members.

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NOTICE OF NEXT MEETING

Please note the change of date

The next meeting of the Society will be held at 7.00pm on **Monday 7 th October**, 2002 in **Room 388 GODDARD Building**, U.Q. The main business will be: **Greg Courtney "Mountains, midges, and monsoons: biosystematics of torrenticolous flies**. "Refreshments will be served before the meeting at 6.30pm in the tea room on level 2 of the Goddard Building.

VISITORS ARE WELCOME