Primary Industries Standing Committee

Forestry and Forest Products Committee

Research Priorities and Co-ordination Committee

RESEARCH WORKING GROUP 7

FOREST HEALTH

Annual Pest and Disease Status Report for Australia and New Zealand 2004-2005

November 2005

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INTRODUCTION

This report presents the annual statement of forest pest and disease conditions throughout Australia and New Zealand for the year 2004-2005. It comprises the seventh combined pest and disease report under RWG 7 (Forest Health). Tabular data to assist in reporting health issues for Montreal Process as requested by the Montreal Implementation Group (Agenda Item 3.1.2, Geevston Meeting Minutes, 2000) is supplied for Western Australia.

PURPOSE

To communicate the annual statement of forest pest and disease conditions and quarantine situation in Australia and New Zealand to the Primary Industries Standing Committee, Forestry and Forest Products Committee, Research Priorities and Co-ordination Committee for its information, consideration and any action deemed necessary.

AUSTRALIA

QUEENSLAND

PLANTATIONS

Pinus spp.

Insect Pests

Sirex noctilio (Sirex wood wasp)

Status unchanged – not yet detected in Queensland. Joint studies by DPI&F and Forests NSW on the susceptibility to Sirex in standing *Pinus caribaea* and the F1 and F2 hybrids of *P. caribaea* and *P. elliottii* were inconclusive. Females were seen to readily drill into all three taxa, pale sawdust showed drilling had penetrated beyond the bark. The females appeared to be ovipositing, with one female laying eggs on the bark surface as the ovipositor was with drawn. However destructive sampling of the trees in March did not show any signs of larval activity. Some billets have been retained in quarantine . All the experimental trees had been prepared for infestation by the standard trap tree preparation method, and by March all were heavily infested by *Ips grandicollis*. This infestation may have affected the development of the *Amylostereum* fungus and the Sirex larvae. The experiment will be repeated using a different method of tree preparation.

Essigella californica

Distribution unchanged, appears throughout the exotic pine estate. *Pinus taeda* continues to be more affected than other Pinus species. The growth trial proposed for *P. taeda,* and mentioned in last year's report, did not take place due to lack of support from DPI Forestry.

Aconophora compressa (Hemiptera: Membracidae) Lantana bug

This membracid is native to Mexico, and was released in Queensland and NSW (Charters Towers to Terrigal) as a biological control agent for Lantana camera in the mid 1990's. The Lantana bug has moved on to several other native and exotic plant species, most notably Fiddlewood – *Citharexylum* sp., but also on to *Eremophila* sp. *Clerodendron* sp, grey mangrove and others. The Lantana bug is now very widespread. The population in Queensland was dramatically reduced by exceptionally hot summer temperatures in the last two years. However the population is now rapidly increasing again. The Department of Natural Resources and Mines Qld is continuing experimental assessment of the effects on grey mangrove and Jacaranda.

Diseases

Little survey work has been done in the *Pinus* plantations in Queensland over the last 12 months due to staff being occupied in the citrus canker outbreak that occurred Emerald. However, extensive dieback areas in the southern coastal plantations were inspected where *Phytophthora cinnamomi* was found to be a contributing factor. This area has also been subjected to extended periods of drought followed by short bursts of severe flooding.

Hoop Pine – Araucaria cunninghamii

Root rot research has been limited in the last 12 months. However, after successfully producing sporing structures in culture, a commercial group is know testing the biocontrol isolates of a *Tyromyces* sp. and *Trametes versicolor* to determine if it is possible to regularly achieve sporulation and allow for the establishment of large scale field trials. This will determine the future of the use of these agents to accelerate decay in hoop pine stumps and aid in reducing tree losses due to *Phellinus noxius* and *Rigidoporus vinctus*.

No health surveys were conducted within the hoop pine in this financial year.

Wollemi Pine – Wollemia nobilis

The occurrence of *Fusicoccum* dieback has been more closely linked to host stress in the form of water logging in the Wollemi Pine. Disease development is generally restricted to the warmer wetter months and to potted indoor plants receiving excess water. Strict watering regimes are now being developed to ensure plant survival when the Wollemi are released to the public. Newly set cuttings are also very susceptible and the stress of minimal root structure and high humidity has resulted in some significant losses.

Invitro studies have been conducted to determine the effectiveness of a range of fungicides and defence promoters in controlling *Fusicoccum*. Folicur^{R} in combination with Kasil^{R} has been shown to significantly reduce Fusicoccum lesion development.

Eucalyptus species

Insect Pests

Insect pests recorded in Queensland plantations and trial plantations in 2005/05.

Agent	Common Name	Host species	Severity
Aleyrodidae	Whitefly	*Corymbia* hybrid	Minor
Apiomorpha sp.	Galls	*E. argophloia*	Minor
Asynonychus cervinus	Fuller's rose weevil	*C. c.* ssp. *variegata*	Moderate
Chaetocnema sp.	Flea beetle	*E. argophloia*	Minor
Chrysophtharta cloelia	Leaf beetle	*E. dunnii*	Minor
Creiis lituratus?	Psyllid	*E. dunnii*	Minor
Doratifera sp.	Cup moth	*E. argophloia*	Minor
Endoxyla cinerea	Giant wood moth	*E. camaldulensis*	Moderate
Endoxyla cinerea	Giant wood moth	*E. dunnii*	Moderate
Endoxyla cinerea	Giant wood moth	*E. grandis*	Severe
Endoxyla cinerea	Giant wood moth	*E. grandis* hybrids	Moderate
Endoxyla cinerea	Giant wood moth	*E. tereticornis*	Severe
Eriococcus coriaceous	Gum tree scale	*E. argophloia*	Minor
Eriococcus coriaceus	Gum tree Scale	*E. cloeziana*	Minor
Eroschema poweri ?	Branch/stem pruner	*Corymbia* hybrid	Severe
Eucalyptolyma sp.	Spotted gum psyllid	*C. c.* ssp. *variegata*	Moderate
Eucalyptolyma sp.	Spotted gum psyllid	*Corymbia* hybrid	Moderate
Hyalarcta huebneri	Leaf bagworm	*C. c.* ssp. *variegata*	Minor
Ophelimus sp.	Plate galling wasp	*E. argophloia*	Minor
Ophelimus sp.	Mid-rib galling wasp	*E. argophloia*	Minor
Oxyops sp.	Weevil	*E. dunnii*	Moderate
Paropsis atomaria	Leaf beetle	*C. c.* ssp. *variegata*	Moderate
Paropsis atomaria	Leaf beetle	*E. argophloia*	Minor
Paropsis atomaria	Leaf beetle	*E. cloeziana*	Moderate
Paropsis atomaria	Leaf beetle	*E. dunnii*	Minor
Paropsis charybdis	Leaf beetle	*E. cloeziana*	Minor
Paropsis variolosa	Leaf beetle	*C. c.* ssp. *variegata*	Minor
Pergagrapta ? sp.	Sawfly	*E. cloeziana*	Minor
Phaulacridium vittatum	Wingless grasshopper	*C. c.* ssp. *variegata*	Moderate
Phoracantha acanthocera	Bulls-eye borer	*E. grandis*	Severe
Phoracantha solida	Two-hole borer	*Corymbia* hybrid	Moderate
Phoracantha solida	Two-hole borer	*Corymbia* hybrid	Moderate
Phoracantha solida	Two-hole borer	*E. camaldulensis*	Severe
Phoracantha solida	Two-hole borer	*E. urophylla* x *E. grandis*	Severe
Phoracantha solida	Two-hole borer	*E. urophylla* x *E. pellita*	Severe
Phylacteophaga sp.	Leaf blister sawfly	*E. cloeziana*	Minor
Phylacteophaga sp.	Leaf blister sawfly	*E. dunnii*	Minor
Polistes sp. ?	Paper wasp	*E. longirostrata*	Severe
Rhombacus sp.	Erinose mite	*C. c.* ssp. *variegata*	Moderate
Strepsicrates ? sp.	Leaf- tying moth	*E. argophloia*	Severe
Thaumastocoris sp.	Winter bronzing bug	*C. c.* ssp. *variegata*	Severe
Yet to be determined	Mistletoe	*C. c.* ssp. *variegata*	Moderate

Psyllids

Following an outbreak of the psyllid *Creiis* sp. at a *E. dunnii* plantation in the Beaudesert area in September 2003, populations were monitored monthly or bimonthly between September 2003 and June 2005. The population crashed in Jan/Feb 2004 and numbers have remained low since. This insect has not yet been reported in any other plantations.

Leaf Beetles

Damage by *Paropsis atomaria* and *Chrysophtharta cloelia* was lower than in previous years with only *P. atomaria* reported causing moderate to severe defoliation in April in some plantations in the Miriam Vale region near Gladstone (central coast). Drought conditions limited the availability of the flush foliage favoured for breeding in most areas.

Fortnightly monitoring of populations of *P. atomaria* at two plantations near Gympie indicated that between 3 and 4 generations were produced between September and May at the more coastal site and 2 generations at a site approx. 30 km further inland.

Swarming Scarabs

Little scarab activity was seen in plantations this year.

Erinose mite

Incidence and severity of erinose mite (*Rhombacus* sp.) damage was assessed across 72 spotted gum (*Corymbia citriodora* ssp. *variegata*, CCV) plantations in SEQ in August and November 2004, and February and May 2005. Severe damage was recorded in only three of these plantations and only in the Sept. assessments. Data obtained from these surveys are currently being spatially analysed to assist in risk modelling for spotted gum plantations.

Plate galler

Minor damage by *Ophelimus* sp. to *E. argophloia* was recorded in two plantations. Another species of *Ophelimus* was also recorded producing mid-rib galls on the foliage of *E. argophloia* in two plantations in SEQ (see below).

Leaf mid-rib galls on *E. argophloia*.

Weevils

Oxyops sp. weevils caused minor damage to a single *E. dunnii* plantation in SEQ and Fullers rose weevil caused widespread moderate damage to a *Corymbia citriodora* ssp. *variegata* plantation in the central Burnett.

Gum leaf skeletoniser

Not recorded

Sawflies

No damage recorded

Leaf blister sawfly

Minor damage was reported by *Phylacteophaga* sp. in single plantations of *E. cloeziana* and *E. dunnii*, respectively.

Wingless grasshopper

Moderate to severe damage was recorded in one plantation of *Corymbia citriodora* ssp. *variegata* in the central Burnett region, SEQ.

Christmas Beetles

No damage recorded

Stem borers

Remain a problem mainly of private plantings of *E. grandis* and its hybrids and *E. dunnii.*

Thaumastocoris sp. Bug

Severe damage due to this bug was first recorded in May 2004 at a plantation of *Corymbia citriodora* ssp. *variegata* in the South Burnett, SEQ. A survey of the plantation in October 2004 showed that about 21 ha of the 41 ha plantation was severely affected (see below). A survey in September 2005 of the same plantation showed that damage was much reduced but bugs were still present in high enough numbers to cause severe 'bronzing' of foliage to a smaller area. *Thaumastocoris australicus* (which causes severe damage to *Eucalyptus* street trees in Sydney) has recently been found damaging *E. grandis* in South Africa, and possibly also California and Argentina.

Overview of plantation in August 2004 showing widespread yellowing and bronzing of trees due to feeding by *Thaumastocoris* sp. bugs.

Severely affected tree with 100% of foliage 'bronzed'.

Severely affected part of plantation.

***Thaumastocoris* sp adult. Actual size approx 3mm length.**

Typical leaf bronzing symptoms.

Flea beetles (Chaetocnema spp.)

Minor damage was recorded in some *E. argophloia* plantings.

Paper Wasps

Paper wasps were observed eating manna and chewing through the bark of stems on newly planted *Eucalyptus longirostrata* in the central Burnett at dusk and during daylight hours. This chewing weakened stems and branches, leading to breakage (see below). Two species of *Polistes* were implicated in the damage.

Paper wasp (*Polistes* sp.) stripping bark of *E. longirostrata* stem.

Paper wasp chewing damage to *E. longirostrata* seedling leading shoot and branches.

Diseases

Quambalaria pitereka

Recent research has focused on the epidemiology and pathogen variability of *Q. pitereka* in spotted gum plantations. Isolates have been collected from northern NSW and southern Queensland plantations and trial plantings in the tropical north. ITS sequencing has been conducted on selected isolates from various regions with results showing various degrees of variability. AFLP work has now begun and will further help answer questions on variation related to region, host and pathogenicity of *Q. pitereka*. Morphological studies have potentially identified new species of Quambalaria occurring on the spotted gum species in Queensland.

Invitro studies have identified optimal growing conditions for *Q. pitereka* with variation in growth rates observed between species. High levels of spore germination occur within 96 hours at relative humidity levels of 90% and above. An inoculation and rating system has been developed and can now be used as a tool for screening for disease tolerance. The effect of spore concentration of disease incidence and severity on young shoots and fully expanded foliage has been investigated with no significant difference found between treatments ranging between $1x10^5$ and $1x10^7$ spores/ml. Disease development is rapid, with symptom development and the production of conidiophores and conidia occurring within 14 days after inoculation. SEM work has shown that conidiophore development occurs within the stomatal cavity.

A hybrid between *C. torelliana* and *C. citriodora* has been developed for plantation use in the near future in Queensland. The apparent resistance of *C. torelliana* to *Q. pitereka* is one of the reasons to adopt this hybrid breeding strategy. However, recent assessments have identified a possible new species of *Quambalaria* occurring on some of the hybrid material. Based on morphological characteristic this appears to be a new species of *Quambalaria*.

Other eucalypt diseases

A recent pest and disease survey was conducted on north Queensland eucalypt trial plantations. Following higher than usual winter rainfall on top of a good wet season, disease levels where high and a few new species identified.

Pheaophleospora sp. nov.

Symptoms closely resembling those caused by *P. destructans* were observed of *E. grandis* and *E. grandis* x *E. camaldulensis* hybrids. Observation of the conidia suggested a new species which was later confirmed through sequencing by Murdoch University. A similar pathogen has more recently been identified from samples of *E. grandis* x *E. camaldulensis* (Dendros) from Mackay in central Queensland.

Cryphonectria

A sample of *Tibouchina radula* collected from Cairns was found to be infected by a species of *Cryphonectria*. Sequencing is being conducted here and in South Africa to confirm the species.

A number of other pathogens including *Mycosphaerella* spp., *Phaeothyriolum* sp., *Aulographina eucalypti* and *Cryptosporiopsis* sp. were found on a range of hosts.

FOREST HEALTH SURVEILLANCE

During the July 2004-June 2005 period no pest and disease surveys were undertaken by the Forest Health Surveillance group within the *Pinus* plantation estate, seed orchards, nor the major production nurseries (Beerburrum & Toolara), managed by DPI Forestry. Although, a static insect trapping project was maintained within the Beerburrum, Fraser Coast and Ingham areas from July 2004 to January 2005. The implementation of static insect trapping stations throughout key plantations was designed to enhance general systematic surveillance.

The trapping system incorporates the use of one intercept panel and three Lindgren 12-funnel traps (wet type) using ethanol and alpha-pinene lures respectively, at each of five sites within the management areas. The funnel traps are set up in a triangular configuration located five meters apart with fresh damaged timber billets placed centrally within this triangle. The intercept trap is located 30 meters from the funnel traps. These traps and lures act as generalist attractants for known and previously undetected economic pest species, drawing from over a 100-200 m radius. Target captures are Scolytids, Buprestids, Cerambycids, Anobiids, Curculionids and Sirex.

Prior to the establishment of the static insect trapping system in 2004, there was no permanent on-site monitoring/detection system within the general exotic surveillance program. This new system extends the capability to undertake routine monitoring for the detection of exotic forest pest incursions in Queensland, beyond inspections immediately surrounding the port of entry.

Continual refinements were made to the forest health static trapping system throughout the trapping period. The importance of insect species and numbers captured within the traps is still being examined and relationships with population density within a compartment or a localised area correlated. High captures of specific species could indicate that some forest operations may need to be expedited, or that these levels will compound stress levels of *Pinus* already suffering from fire, drought, nutrition or storm-damage.

This project focused on a set insect target list, but this list was modified progressively as new insects were identified. So far 23 pinhole & shothole borers (Scolytidae & Platypodidae) have been identified from winter trapping within the areas enclosed within Beerburrum, Toolara & Ingham State forests.

Ingham samples examined have revealed the presence of 13 pinhole & shothole borers (Scolytidae & Platypodidae), of which a few require further researching. Up to 9 species have appeared in a sample. The tiny pinhole borer ***Cyrtogenius brevior,*** recently first recognised in dead stems of *Pinus* at Lannercost SF, during Forest Health Surveillance trips (20 Feb. 2002, 22 Jan. 2003), has now been captured in Cpt. 10 Ellerbeck LA., Ingham. *Ips grandicollis* is being trapped in the Toolara & Beerburrum static traps, so if *Ips* does breach the central Queensland quarantine line north of Byfield SF (Rockhampton), the static traps at Ingham will disclose their presence.

From the **Toolara** samples, 13 pinhole borers (Scolytidae & Platypodidae) have been identified. Up to 9 species have appeared in a sample. One, ***Hylurgus ligniperda*** (originates from Europe) is a "new exotic" for Toolara (Cpt. 201A South Dempster LA., 16 & 29 July 2004), and was only previously only known in Queensland from the Passchendaele area, but it seems well established otherwise in the southern states. When this species first appeared at Passchendaele SF during November 1997, the literature available indicated it was restricted to logs; however Eldridge (1983) indicates that *H. ligniperda* not only bores into root collars of dying *Pinus*, but can also girdle living *Pinus*. This would suggest that this scolytid could contribute to decline of *Pinus* during stress periods. At present only a few specimens of *H. ligniperda* have been taken.

Winter captures indicated that the five-spined bark beetle ***Ips grandicollis*** is present in low numbers at Toolara, although sample numbers increased during mid to late August 2004. This exotic species (a carrier of *Ophiostoma ips*) remains confined to southern Queensland (south from Byfield SF). Random examinations of *Ips* are being made at a species level, to ensure that another species of *Ips* does not appear in the region. There are about 60 species of *Ips* (which are very similar to each other) in the northern Hemisphere, and many can be more destructive than *Ips grandicollis*. *Ips typographus* is listed in the AQIS target species list, as a possible traveler in packaging or dunnage contaminated with bark.

At **Beerburrum** the levels of ***Xyleborus ferrugineus*** was noteworthy. Numbers of these insects were low in the Toolara area apart from a higher recording in Cpt. 65 South Dempster LA in mid July 2004, but there were a number of high recordings for samples taken from Beerburrum. High numbers were collected in Cpt. 8A Black Swamp LA in Apr 2004, and very high levels during early November 2004. This was

the insect species responsible for the majority of damage to logs in the Beerburrum water log store. Beaver (1987) states that "*X. ferrugineus* as a carrier of *Ceratocystis fimbriata* (a canker stain), is considered to be probably the most destructive scolytid in the tropics, primarily through its attacks on recently felled timber".

Examinations have revealed that ***Hylurgus ligniperda*** (Goldenhaired bark beetle) is also present in Beerburrum, but in very low numbers (Cpt. 8A Woodford LA., 24 Apr. 2004). Surprisingly a number of large longicorn beetles were trapped at Beerburrum. The larvae of these longicorn beetles ***Cacodacnus planicollis*** are usually found in the dead trunks & logs of *Pinus* in the Tuan / Toolara & Beerburrum regions. These are not normally a problem in plantations (although there was a case of a larva remaining active for 11 years in a pine wall at Hyne & Son Pty Ltd, Tuan, confirmed by its emergence in 1998).

The number and complexity of species captured during the winter months was unexpected and summer trapping counts will provide more important information on species activity.

QUARANTINE

Japanese Pine Sawyer, Monochamus alternatus

In June 2005, two live and two dead beetles were found on pine dunnage in a Quarantine Approved Premises at Hemnant near the Port of Brisbane. The crated dunnage was associated with electrical transformers imported from Shanghai, China in early-May and had been under periodic AQIS scrutiny since that time because of the presence of soil on the flatbed container. No insect activity or damage to the timber had been noted until the discovery of adult beetles by company employees. The timber came with IPSM 15 (International Standards for Phytosanitary Measures) certification, purporting it to be bark free and either heat treated or fumigated with methyl bromide prior to export. The IPSM 15 brand was situated directly below a large flitch of bark on one crate.

Beetles and wood were infested with nematodes and the timber was immediately fumigated with methyl bromide and later deep-buried or heat-treated. Insect traps baited with an attractant for Japanese Pine Sawyer were deployed in the area and all pine trees within approximately 3 km radius of the initial find mapped and their health assessed. These same trees will be inspected regularly over the next year and if their health deteriorates they will be assessed for possible infestation by pine wilt nematode.

West Indian Drywood Termite, Cryptotermes brevis

Five buildings in Brisbane, one in Rockhampton, one in Maryborough, and furniture at Broadbeach were fumigated in 2004/05. These were mostly in known areas of infestation, but recently submitted samples from Rockhampton are at new foci and the circumstances are being investigated.

Red Imported Fire Ant, Solenopsis invincta

The fourth year of the eradication program has been completed. The insect has been found only in the Brisbane-Ipswich area of southeast Queensland although the margins of the treatment and surveillance areas have extended slightly with the finding of several outliers during the year. Treatment is complete in the core central area and the southwest extension, and surveillance shows a 99.4% eradication success rate. The drive is on to find and eradicate the last remaining nests. The main program is scheduled to end in June 2006 though there will be a need for continued activity beyond this time to deal with the 'tail' of the infestation and monitor all target areas. An international workshop on RIFA was held in Brisbane in August 2004. Independent audits of the scientific and operational components of the program have confirmed the progress being made towards eradication, although it may be some time before this is achieved.

Gypsy Moth, Lymantria dispar

A draft response plan in the event of an incursion of gypsy moth into Australia was completed in June 2005. It was commissioned by the Australian Department of Agriculture, Fisheries and Forestry and is being circulated for stakeholder comment. It was originally intended that the plan would cover just Asian Gypsy Moth but the occurrence of hybrids between the European and Asian strains, with females capable of flight, means that the risk is now broader, and all strains of L. dispar are targeted.

RESEARCH AND DEVELOPMENT

Hardwoods

- Queensland University of Technology ARC Linkage PhD student Michael Duffy commenced a project entitled, "Enhancing natural enemy mortality of chrysomelids in young eucalypt plantations through habitat manipulation". This research is focussing on the biology and ecology of *Neopolycystus* sp. a primary egg parasitoid of *Paropsis atomaria* in SEQ eucalypt plantations.
- Related to the above project, the Department of Primary Industries and Fisheries, Horticulture and Forestry Science (H&FS, previously Queensland Forestry Research Institute) commenced research into the host-finding mechanisms of *Neopolycystus* sp. and carried out fortnightly sampling in two *E. cloeziana* plantations to assess the population phenology of *Paropsis atomaria* in relation to CDI and foliage phenology. Sampling methodology was developed in collaboration with Dr Mamoru Matsuki of the IPMG group in Western Australia. These data are being utilised in the further development of a Dymex model for this pest.
- Quarterly surveys of the incidence and severity of erinose mite damage were carried out by DPI-Forestry and H&FS in over 70 spotted gum (*Corymbia*

citriodora ssp. *variegata*) plantations in SEQ. Data from these surveys are currently being analysed to evaluate risk factors for this pest.

- Further elucidation of the components of the giant wood moth sex pheromone (*Endoxyla cinerea*) was conducted by H&FS in collaboration with Dr Chris Moore (DPI&F Plant Science). Some promising compounds were found but these have yet to be fully characterised. Preliminary chemical analysis was also carried out on volatiles associated with aggregations of *Automolus vulgaris* swarming scarabs and the sex pheromone of the cedar tip moth *Hypsipyla robusta*.

- An agreement has been developed amongst 9 R&D providers and forest growers in north-east NSW and south-east Queensland to form the "Subtropical Forest Health Alliance". The primary aims of the alliance are to: coordinate the development of collaborative research project proposals; liaise between research providers and commercial forest managers; improve training and technology transfer and build capacity for forest health research and development in the region.

NEW SOUTH WALES

PLANTATIONS

Pinus spp.

Insect Pests

Sirex noctilio (Sirex wood wasp)

There were only localised and low levels of mortality associated with Sirex observed during 2004 surveys. The management strategy (biological control and surveillance) has been very effective. Trap tree establishment has been an ongoing problem in several Regions, with training planned for early 2006.

Ips grandicollis (Fivespined bark beetle) and other bark beetles

There were no significant occurrences of *Ips* in NSW in 2004-2005. There are indications from winter surveys in 2005 that levels of *Ips* are increasing in certain areas in Hume and Northern Region. High numbers of *Ips* were observed in sirex trap trees in both Regions.

Essigella californica (Monterey pine aphid)

Essigella californica numbers and damage was lower than previous years in all areas. Forests NSW part of a National study investigating the impact and causality of Essigella. This insect pests costs the pine plantations industry in Australia $**21 million** per annum, or **$53**/ha/yr, in ost wood production. Forests NSW has approx. 150,000 ha that are at risk from *Essigella* defoliation. A cost benefit analysis was conducted on several control options (May, 2004), with biological control the best option: at a cost of **~$20,000** per annum over 5 years (contribution to a national management strategy) Forest NSW is set to benefit **$3-5 million** (NPV).

Diseases

Dothistroma septosporum (Dothistroma needle blight & cast)

Dothistroma severity was lower than previous years in Northern Region; no control spraying was required.

Armillaria novaezelandiae

Mortality from *Armillaria* was still a continuing problem at Acacia Plateau (Northern).

Sphaeropsis sapinea (=Diplodia)

Drought-related *Sphaeropsis* damage was again the main problem observed in surveys, although lower than previous years. Again, more severe in un-thinned stands:

- ~1250 ha in Hume (Kangaroo Vale, Nanango & Carabost)
- ~4200 ha in Macquarie (Pennsylvania, Vittoria, Mount David, Vulcan, Kinross, Essington, Roseberg & Glenwwod).
- Mostly low levels in Monaro but high in Pericoe and Craigie.
- Low levels in Northern

Environmental (drought, frost, fire, nutrient, weeds, etc.)

Snow damage

Snow damage was a significant problem in Monaro, with a total of 6755 ha affected. However, only 1700 ha had moderate to severe damage, where broken branches or broken tops occurred.

Hail damage

Hail damage caused localised damage in Northern and Monaro regions.

Vertebrate pests

Possum

Possum damage was significantly lower than previous years in Monaro Region.

Wallaby

Wallabies are now becoming a problem in some of the younger age classes in Monaro and Macquarie.

***Eucalyptus* species**

Insect Pests

Psyllids (Cardiaspina, Ctenarytaina, Creiis)

Creiis was again a significant problem in *E. dunnii,* however only a few plantations were severely affected. Some of these may not recover. No control operations were conduced. Low numbers of *Creiis* were observed in many plantations.

Leaf beetles

Chrysomelid leave beetles were common but mostly at low levels of severity, and most commonly in *E. dunnii*. One exception was very severe defoliation by Chrysomelids in the *E. dunnii* at Frost plantation in Dorrigo, where 95% defoliation had occured. Dead-topping was observed here, with a range of stem fungi identified (*Tubercularis lateritia*, *Botryosphaeria* sp., *Cryphonectria eucalypti*). Severe insect damage was also observed in the adjacent native forest.

Erinose mite (Rhombacus sp.)

Erinose mite was observed in several clonal trials in northern NSW. Damage was more severe in the most northerly trials (around Bonalbo), and almost non-existent in trials around Coffs Harbour.

Stem borers

Stem borers were a continuing problem in the older plantations, especially *E. grandis.*

Fungal and insect damage

Damage from a range of insects and fungi, including *Phaeophleospora epicoccoides* (red tide) and Chrysomelids, caused continual severe damage to *E. grandis* at several blocks, including Morrows, Fitzpatrick's and Bates #2. It is obvious that these blocks are not well suited to *E. grandis.* It is expected that many trees will not recover, with dead-topping and mortality observed.

Diseases

Corymbia shoot blight (Quambalaria pitereka)

Quambalaria (=Ramularia) eucalypti was observed for the first time in *E. grandis* at Morrows during surveys in 2004. This fungus acts in a similar manner to *Q. pitereka*, which is the most common and damaging fungus in spotted gum plantations. At present *Q. eucalypti* it is not causing significant damage, and is rare (although endemic to Australia).

Stem cankers

Severe stem canker resulting in dead-topping and tree mortality was again observed at Marsden plantation at Dorrigo. This damage is associated with several stem and root fungi, including a species of *Caliciopsis* and several commonly found canker fungi (*Botryosphaeria* sp., *Cryphonectria eucalypti).* *Caliciopsis* sp. is normally only associated with localised cankers, and mostly on branches. Further work is required on this disease problem to determine exactly why this plantation is affected and not others.

Low levels of damage and mortality associated with stem canker fungi (*Botryosphaeria* sp., *Cryphonectria eucalypti*) were observed in several older plantations. It is expected that these fungi may become a bigger problem as plantations age.

Phaeophleospora spp.

Continued severe defoliation of *E. nitens* in Nash's block near Dorrigo was again observed. Trees had 95% defoliation, caused mostly by *Phaeophleospora eucalypti*, and this has resulted in dead-topping of some trees. Continual infection will result in further dead-topping and tree mortality.

Mistletoe

Levels of mistletoe were alarmingly high (65%) in several *C. variegata* plantations, and at lower levels in up to 15% of spotted gum plantations. The impact of mistletoes is currently being examined.

MANAGED NATURAL FORESTS

Native forest dieback is a continuing problem in coastal NSW. Aerial surveys in northern NSW were conducted in March 2004 with 20,000 ha identified with some level of dieback.

Armillaria root rot was identified as the cause of mortality of *E. delegatensis* in restricted areas in the Southern Tablelands.

NURSERIES

Conifer species

No significant pest or disease problems reported.

Eucalyptus species

Eriophyoid mites caused damage in *Corymbia* spp. clones in northern NSW. Control spraying was necessary.

URBAN AND RURAL

Cardiaspina maniformis and *C. fiscella* were observed causing severe damage in many mature stands of *E. grandis* in central and northern NSW. Severity of damage appeared greater than that observed in 2003-2004. Significantly, damage was not severe in the large mature *E. grandis* plantations in northern NSW.

Thaumastocoris australicus continues to cause significant damage to street trees (*Eucalyptus nicholii* and *Eucalyptus scoparia*) in Sydney, with greater than 50% foliar damage and dieback. A second undescribed species of *Thaumastocoris* has also been found on *Corymbia maculata* and *Corymbia citriodora* again on Sydney urban trees.

QUARANTINE

In early April 2005, the exotic West Indian drywood termite *Cryptotermes brevis* was found in a hoop pine mirror frame at Newport, Sydney, by a pest controller. Forests NSW confirmed the identity of the termites and notified AQIS. The mirror frame was removed and fumigated by AQIS. Termites were found to have penetrated the wall behind the mirror in several places. Forests NSW oversaw the removal of the wall lining and inspection of the timber frame. No termites were found; no further action was deemed necessary.

VICTORIA

PLANTATIONS

Pinus spp.

Insect Pests

Sirex noctilio (Sirex wood wasp)

In Victoria, the incidence of Sirex over summer 2004-2005 remained at low levels across the state although a small number of 'hotspots' were identified where Sirex has the potential to increase and remedial actions recommended accordingly. To date, no Kamona strain has been recovered, with the 'defective' and 'other' strain predominating in field samples. Emphasis has been placed on ensuring sufficient inoculations are done using the more effective Kamona strain nematode coupled with timely surveillance and thinning of susceptible stands. Parasitoid populations of *Ibalia* and to a letter extent *Megarhyssa* and *Schlettererius* continue to emerge at elevated levels providing a useful secondary means of Sirex control.

Ips grandicollis (Fivespined Bark Beetle) and other bark beetle species

Ips grandicollis has remained at trace levels only with no significant outbreaks recorded. *Hylurgus ligniperda* caused minor localised damage in one year old plantations in south west and west central Victoria.

Essigella californica (Monterey Pine Aphid)

The Monterey Pine Aphid populations has again caused significant defoliation of *Pinus radiata* stands predominantly in north east Victoria although significant amounts of defoliation have also been observed in selected areas throughout the state. While 15 year-old thinned stands of *P. radiata* have been the predominant age class to be defoliated, increasingly, defoliation of younger trees has been observed on a more frequent basis.

Diseases

No major outbreaks of disease were observed during the Forest Health Surveillance program within Hancocks Victorian Plantations during 2004/2005.

Dothistroma

Dothistroma septospora while still at relatively low levels across the plantations surveys have shown some hot spots with levels up to 80%defoliation in some areas of the north-east of the State. While no spray programs were conducted in the State for

2004/2005 further assessments in Spring 2005 will establish if a limited program may be needed for the 2005/6 season.

Cyclaneusma Needle Cast

Defoliation associated with Cyclaneusma was recorded in most areas of plantations in the State, with some areas exhibiting moderate defoliation levels.

Other

Diplodia in association with the previous drought, is continuing to cause dead topping and death of trees in some plantations throughout the State.

Eucalyptus species

Insect Pests

Mnesampela privata (Autumn Gum Moth)

Autumn Gum Moth has caused only minor damage in a small number of plantations throughout the state and has not been of concern over the past year.

Chrysophtharta and Paropsis (Chrysomelid Leaf beetles)

Leaf beetles of both genera have caused low levels of defoliation (up to 20%) in 16 year-old stands of *E. globulus*, *E. viminalis* and *E. nitens* in north-east Victoria during the 2004-2005 summer with damage generally observed in the upper 50% of the tree canopy. Low levels of upper crown defoliation (up to 20%) was also observed in 14 year-old *E. globulus* and *E. nitens* plantations in East Gippsland, while low levels (up to 20%) were also observed in the upper crowns of *E. globulus* in the Shepparton irrigation region over the same period.

Perga spp. (Sawflies)

Sawflies were again observed causing trace to low levels of defoliation only in north central and south west Victoria during winter 2004. Damage was generally confined to individual and small clusters of trees of predominantly *E. camaldulensis* and to a lesser extent *E. globulus*. Defoliation was predominant in the upper 50% of tree crowns although in severe cases, lower crowns were also affected.

Phorocantha spp. (Longicorn Borers)

Phorocantha acanthocera continues to occur at low levels only in eucalypt plantations in East Gippsland. Observations confirmed that *Eucalyptus saligna* and *E. viminalis* remain the preferred host tree species, with attack confined to individual trees of these species within stands. It is anticipated that as some older unthinned

stands start to self thin, coupled with having received higher than average rainfall, stress levels on trees will reduce and borer attack will reduce in intensity.

Endoxyla spp. (Cossid moth)

Trace levels of *Endoxyla* damage were observed in *E. saligna* in East Gippsland during summer 2004/2005 with low levels of mortality recorded either through ringbarking or windthrown resulting from a weakening of the main stem.

Cardiaspina spp. (Psyllids)

Psyllids of the genus *Cardiaspina* has been observed causing low levels (<20%) of defoliation to predominantly *Eucalyptus camaldulensis* plantings in northern Victoria during 2004 with the damage generally confined to localised areas rather than being widespread. Defoliation occurred predominantly in the lower crown of trees with levels up to 35% in some stands being recorded compared to levels ranging up to 15% in the upper crowns.

Other Pests of Eucalypts

- Low levels of damage were observed over summer 2004-2005 to *E. grandis* plantations in north central Victoria by the Leaf Blister sawfly (*Phylacteophaga froggatti*). Damage was predominantly confined to young juvenile foliage on two year old trees.
- Eucalypt weevils (*Gonipterus* sp.) were again observed causing damage to three year old eucalypts (predominantly *E. viminalis*) in plantations in north east Victoria during late summer/early autumn 2004. Damage was generally confined to foliage in the lower crown of the trees where up to 50% defoliation occurred.
- Christmas beetles (*Anoplognathus* spp.) caused trace levels only of defoliation in the upper crowns of four year old *E. globulus* plantations in Gippsland over early summer 2004-2005.
- Significant levels of Gumtree scale (*Erioccus*) were observed in an *E. grandis* plantation in north-central Victoria where it caused significant dieback although subsequent mortality was not generally observed.
- The Gum Leaf Skeletoniser *Uraba lugens* caused low levels of damage to native stands of *E. camaldulensis* along the Goulburn and Campaspe Rivers in north-central Victoria over late summer and early autumn 2005.

Diseases

Mycosphaerella

Mycosphaerella defoliation in 2 year-old *Eucalyptus globulus* plantations in South Gippsland, was the only significant disease reported within eucalypt plantations during 2004/2005. However observations in Septemeber 2005 suggest that the disease is building up in the Otways.

NURSERIES

Conifer species

Phytophthora cinnamomi remains a high priority for monitoring so as to reduce the further spread of disease.

Eucalyptus species

No reports of damage due to pathogens were recorded in 2004/2005.

NATIVE PLANT COMMUNITIES

Few diseases were reported from native forest communities during 2004/2005. *Phytophthora cinnamomi*, continues to expand in areas such as the Brisbane Ranges.

MANAGED NATURAL FORESTS

Didymuria violescens (Spurlegged Phasmatid)

Following information received in March 2005, inspections of several 1939 Mountain ash regrowth stands in the Victorian Central Highlands revealed significant levels of phasmatids in both older trees and younger regeneration surrounding older stands. Follow up surveys will be occurring in winter and spring 2005 to determine both the extent and anticipated phasmatid levels over the 2005-2006 summer.

Cardiaspina bilobata (Mountain ash psyllid)

An inspection was conducted of mountain ash psyllid monitoring plots in March 2005 with the survey indicating that populations are at trace levels only and as a consequence, unlilely to cause significant defoliation this year. Observations made indicate general tree health to be very good at all three sites and in the surrounding forest with minimal insect/pathogen damage evident.

Eucalyptus Leaf Beetle (Chrysophtharta agricola)

Compared to significant outbreaks observed in previous years, especially on the Nunniong Plateau in north-east Victoria, subsequent damage and associated defoliation levels have declined substantially over the past years across the native forest estate. Although the precise cause(s) of the outbreaks were unknown, it was felt that the very dry conditions experienced in previous years substantially contributed to the decline in canopy health observed and that the good levels of rainfall received in

the past 8-9 months have assisted greatly in alleviating stress levels within trees and their susceptibility to leaf beetle attack

Cardiaspina retator (Red gum basket lerp)

Infestations of *E. camaldulensis* by the Red gum basket lerp *Cardiaspina retator* have continued over the 2004-05 summer, with significant defoliation again observed in northern Victoria making it three years of concurrent defoliation. Defoliation is less widespread than that observed last year, with the recovery of trees progressing slowly.

Cardiaspina squamela (manna gum lerp)

Following a report of extensive defoliation of forested areas south of Ballarat in late 2004, follow-up inspections revealed that extensive areas of *E. viminalis* had been defoliated by the psyllid species *Cardiaspina squamala* (manna gum lerp). Follow-up surveys will be conducted in 2005 to see whether infestations continue.

Doratifera vulnerans (Mottled cup moth)

In response to significant defoliation occurring in Gippsland *E. globoidea* forests by the mottled cup moth (*Doratifera vulnerans*) in November 2003, follow-up surveys were conducted in late 2004 to determine whether conditions were again suitable for another outbreak. Apart from low levels of defoliation recorded in isolated areas, now new significant occurrence was recorded. Based on historical experience, it is unlikely another outbreak will occur in the foreseeable future.

Few diseases were reported from native forest during 2004/5.

URBAN AND RURAL

In August 2004, another new species to Australia, *Phytophthora niederhauserii*,was isolated from the soil and roots of dying *Xanthorrhoea australis* (Austral Grass Tree) in Melbourne. Pathogenicity testing was undertaken of a selection of genera/species of Australian native species to *P. niederhauserii*, including *Acacia melanoxylon*, *Allocasuarina verticillata, Banksia integrifolia, Corymbia ficifolia*, *Eucalyptus globulus, E. gunnii*, *E. nitens*, *Grevillea rosmarinifolia*, and *Nothofagus cunninghamii.* When compared to *P. cinnamomi*, this pathogen appears to be a relatively weak pathogen on these species with the exception of *Allocasuarina verticillata* where stem girdling occurred. Further tests with other species will continue in 2005 to evaluate the risk this pathogen may have to Australia.

Only one further Canary Island Date Palm in Melbourne was found to be infected with *Fusarium oxysporum fsp canariensis* (Fusarium Wilt) during 2004/2005. This brings to 11 palms that have been infected with the pathogen. All palms have been

removed and deep buried in a quarantine tip. Surveys within the major plantings of palms in Melbourne are to continue in 2005-6.

Investigations into the cause of Mundulla Yellows is continuing with a multi-disciplinary team drawn from the Department of Primary Industries and University of Melbourne through funding by Environment Australia and South Australia Department of Environment and Heritage. Monitoring plots have been set up in South Australia, Victoria, Western Australia, and Tasmania, with sites in NSW to be included in 2005. Studies to date suggest that soil factors play a significant role in the development of the 'disease' and that it appears to be a form of induced iron chlorosis. While the symptoms could be reversed using iron chelates, the cause/s of their development are still to be determined.

The City of Melbourne continued to support surveys for Dutch Elm Disease in the main gardens and boulevards under their management. Symptoms resembling DED were attributed to ringbarking of branches by possums and elm bark beetles. The fungus could not be isolated from wood of any trees exhibiting flagging due to beetles.

MONITORING AND SURVEILLANCE

Lymantria dispar (Asian Gypsy Moth)

Monitoring of the ports of Melbourne, Geelong and Westernport continued for the Asian Gypsy Moth over summer 2004/05 as part of a nationwide monitoring program. Apart from native lepidopterous species being trapped, no exotic species including gypsy moths were detected during the survey.

Hylotrupes bajulus (European House Borer)

Resulting from the reported incursion of EHB in Perth recently, measures are currently in preparation to conduct inspections of areas within Victoria previously infested with EHB in the 1950's onwards to establish area freedom for the borer in this state. To date, surveys for other insect pest species have not shown up evidence of active EHB as an incidental finding to these surveys.

Sirex juvencus

Reports were recently received of an incursion of *Sirex juvencus* arriving in wooden pallet material in a warehouse in Brooklyn, a suburb of Melbourne. An examination of existing records show this species has been recovered on the Mornington Peninsular in the 1960's indicating is has been found but has either failed to establish or exists in the field at barely detectable levels. Surveys are in progress of susceptible trees surrounding the Brooklyn site to ensure the insect either has not established or any trees subjected to potential attack are disposed of.

Plantations and Native Forests Monitoring

The Forest Health Surveillance Group has been working closely with industry developing and conducting ongoing insect pest and disease surveillance programs in both softwood and hardwood plantations throughout the state to meet their varying operational and stewardship requirements.

QUARANTINE

Bursaphelenchus

In February 2000, *Bursaphelenchus hunanensis* nematodes were isolated from a dying *Pinus halepensis* tree in a botanical garden near the port of Melbourne. An eradication program was approved as a precautionary approach to their introduction by the then Standing Committee of Forestry (now Forests and Forest Products Committee) under the coordination and support of a National Consultative Committee established for this purpose.

Extensive surveys across Melbourne over the next 4 years resulted in the removal of 39 mature pine trees that contained the nematodes. No further trees have been identified as being infected with the nematode since January 2003., and no *Monochamus* beetles (the normal vector of the nematode) were detected.

The FWPRDC sponsored project at Adelaide University is progressing with sequencing, morphology and biology studies and should be completed in 2005-6.

TASMANIA

PLANTATIONS

Pinus spp.

Insect Pests

Sirex noctilio (Sirex Wood Wasp).

Trap trees were established in four northern plantations managed by Rayonier. Nematode introductions were not required. Three other plantations surveyed had isolated *Sirex* struck trees, which at this stage do not warrant control. Nematode control using the Kamona strain has been very successful (93%) in the absence of defective strains. *Ibalia* were reared from billets taken from attacked trap trees at all sites. *Sirex noctilio* females were captured in quarantine static traps placed in one kilometre radius of the port of Bell Bay in northern Tasmania and Hobart Airport in southern Tasmania. Static panel traps, charged with a-pinene, captured Sirex females flying in three P. radiata plantations which did not have struck trees detected during routine Forest Health surveillance.

Ips grandicollis (Fivespined bark beetle) and other bark beetles.

Ips grandicollis is not yet present in Tasmania. *Ips* pheromone traps are monitored during the summer months at two sites in northern Tasmania and one in the south.
Port surveillance static traps at a number of port surround sites, where *Pinus* species were present, again captured large number of *Hylastes ater* and *Hylurgus ligniperda*. *Hylastes ater* was also caught in static traps at the Warra LTER site. Taxonomists overseas are currently examining two other unidentified scolytids, captured in static traps.

Essigella californica (Monterey pine aphid).

The Monterey pine aphid is widespread in southern Tasmania but has not yet been detected in the north. Population levels have remained at very low levels and have not caused economic increment losses at any site since the initial establishment.

Eulachnus thunbergii (pine aphid).

Not recorded from Tasmania.

Pineus laevis (pine aphid).

Remains a minor problem in wildling regenerated plantations in eastern Tasmania. In the rest of the State attacks suppressed trees at the plantation edge along roadsides.

Diseases

Dothistroma

Ringarooma Block in northeastern Tasmania remains the *Dothistroma* capital of Tasmania. Overall defoliation levels are not sufficiently severe to justify spraying although in localised hot spots 50-75% defoliation occurs.

Diplodia

Diplodia and other wound colonisers including *Pestalotiopsis* and *Dichomera* were *recovered* from lesions in dying lateral branches. Branch death symptoms were detected in about 250 ha of plantations in the central north of the State and appeared soon after a severe storm event.

Spring needle cast (SNC)

This remains the most significant disease in radiata pine in the State, affecting all high, wet (>400 metres and > 1200 mm rainfall) plantation areas. Seed from genotypes more resistant to SNC / Cyclaneusma (NZ selections) are use in all high-risk areas. A decision has been made to move towards silvicultural regimes that will further limit the impact of SNC. In plantations most distant from softwood markets plantations will be managed under a knot-control regime (no pruning and high stocking until a mid-rotation commercial thinning) and clearwood regime (pruning and waste thinning of unpruned trees) in plantations on high quality sites closer to markets.

Abiotic causes

Plantations in the central north of Tasmania suffered damage following a severe storm in spring 2004. The worst damage was at Branches Creek where approximately 60 ha suffered windthrow and stem breakage.

The incidence of lightning damage was much lower than in the previous couple of years. Only one patch was seen in a plantation in the central north of the State.

Symptoms of boron deficiency were seen at a moderate incidence (1-5%) scattered throughout a 210 ha plantation in northeastern Tasmania that has a history of nutrient deficiencies.

Vertebrate pests

Bark stripping of young trees by Bennett's wallaby continues to cause significant damage although levels have decline from previous years. Mortality was generally below 1% although about 40 ha of plantation in northeastern Tasmania was mapped as having mortality exceeding 5%. A recent

Top death following bark chewing by brushtail possums caused moderate damage in about 60 ha in plantations in the northwest. The majority of the mapped area was in coupes that had a long history of possum damage.

Mammal shoot browsing causing mortality or stunting was mapped as a problem in about 65 ha in northeastern Tasmania. In the worst case only 10% of planted trees remained.

Eucalyptus species

Insect Pests

Leaf beetles (Chrysophtharta spp.)

Leaf beetle populations were higher than in previous years. Over threshold populations were measured in 5533 ha of which 3472 ha were sprayed using either the biological insecticide spinosad (early instar populations of chrysomelids) or α-cypermethrin (mixed population of chrysomelids and *Gonipterus*).

Post-season monitoring is increasingly showing that late season defoliation by adult beetles is not being effectively controlled by the IPM targeting larvae. Trials are progressing to test the potential of whole of season protection, particularly against late season damage by adult beetle, using systemic nicotinamide insecticides applied to "trap trees".

Several high altitude plantations in northeastern Tasmania that experienced late season defoliation by leaf beetles in the 2003-4 suffered significant shoot death leading into the 2004-5 growing season.

Weevils.

High egg populations of *Gonipterus scutellatus* in admixture with leaf beetle prompted operational control operations using α-cypermethrin in 1431 ha of young *E. globulus* plantations. Monitoring of parasitism levels of eggs in the Huon District found that levels of egg parasitism did not begin to increase until early summer..

Autumn Gum Moth (Mnesampela privata).

Low levels of activity in the eucalypt estate.

Psyllids (Cardiaspina, Ctenarytaina, Creiis).

Blue Gum Psyllid is present in all *E. globulus* juvenile age planting's, often heavily infesting shoot buds, but causing little long-term impact.

Moderate levels of premature leaf senescence due to *Hyalinaspis* spp. was recorded in three (two *E. globulu*s and one *E. nitens*), 3-4-year-old plantations in Huon District.

Swarming Scarabs.

No problems this summer.

Gum leaf skeletoniser (Uraba lugens)

Moderate-severe skeletonising of edge trees was detected in two *E. nitens* plantations in Urana Block, northeastern Tasmania. Elsewhere only low levels of damage were recorded.

Sawflies.

No detection's of sawfly damage in eucalypt plantations were made during the past year.

Stem borers.

The longhorned beetle *Phoracantha mastersi* is still a minor pest of eucalypt plantations causing patch death at sites of poor drainage or new road disturbance.
In southern *E. globulus* plantations attack by the wood moth *Culama* sp. is frequent on trees six to eighteen months of age. Attack sites are often flooded with resin and most larvae do not establish. On older trees *(E. nitens* and *E. globulus* aged 3-6) cossids attack 2-4% of trees. Stem borers are a developing problem in mid-age plantations on drought effected sites especially following thinning and pruning operations.

Gum Tree Scale (Eriococcus).

In a number of plantations and farm wood lots *Eriococcus* scale was present in large numbers on lower branches of 2-5 year old *Eucalyptus nitens.* In plantations the scale disappeared following pruning.

Diseases

Foliar diseases

Mycosphaerella leaf disease was much less of a problem this year than in earlier years following the change of species from *E. nitens* instead of *E. globulus* in the high-risk Circular Head area. Serious early spring defoliation (>50%) was limited to about 60ha of young *E. globulus* plantations in northeastern Tasmania. However, the localised epidemics would not have persisted because below average rainfall conditions occurred throughout much of the 2004-5 growing season across northern Tasmania

Root rot

Mortality due to root and collar rot by *Phytophthora cinnamomi* was widespread throughout about 110 ha of young *E. nitens* plantations in the far northeastern corner of the state. Affected trees were scattered throughout the plantations at an incidence of generally below 2%.

Small (0.1 ha), localised patch deaths due to Armillaria were detected in two 5-year-old *E. nitens* plantations. One patch was associated with shallow, rocky soils and the other surrounding a small gully.

Cankers

Stem lesions of *Botryoshpaeria dothidea* (unconfirmed) were abundant in a recently thinned 5-year-old *E. nitens* plantation in the central north of the State. Mortality and top / branch death was occurring at an incidence of about 10% across an area of about 5 ha following severe drought conditions during summer – autumn 2005. A range of stress-related wood-boring insects (*Phoracantha*, *Culama*) were also common in affected trees.

Vertebrate pests

Shoot browsing of recent transplants by browsing mammals remains the most significant biotic agent affecting the health eucalypt plantations. Severe shoot browsing (>50% leaf loss) was recorded in twelve 1-2 year-old *E. nitens* plantations during the past year. The majority of the more severely affected plantations were at moderate to high altitudes where trees take longer to establish after planting.

Abiotic causes

Shoot damage (stem pitting, splitting and breakage) resulting from a hail storm damaged 10 ha of a 2-year-old *E. globulus* plantation in the central north.

Symptoms of copper deficiency were widespread throughout the State in young plantations of *E. nitens* and to a lesser extent, *E. globulus*. Symptoms, particularly of microphylly and leaf cupping respond well to remediation with copper. The role of particular herbicides in increasing the susceptibility of eucalypt seedling to copper deficiency has been suggested but not yet investigated.

Mid-rotation plantations in the high altitude blocks of northeastern Tasmania continue to suffer losses from windthrow after thinning. In the past year 45 ha was mapped with moderate levels of windthrow. A windthrow risk tool has been developed to help managers reduce the risk of windthrow after commercial thinning. In the longer term it is hope that silvicultural regimes involving two-stage thinning will reduce the risk of windthrow.

MANAGED NATURAL FORESTS

Pathogens

A significant extension in the distribution of *Phytophthora cinnamomi* occurred with the introduction of the pathogen into a Priority Management Area following partial failure of hygiene prescriptions implemented during road construction. The infestation

is currently very restricted in distribution and it is planned to attempt an operation to eradicate the pathogen.

Abiotic causes

Extensive areas of crown dieback continue to develop on the Central Plateau and the northern slopes of the Great Western Tiers.

NURSERIES

Conifer species

Pests

No insect problems in Tasmania.

Pathogens

No disease problems were reported. Open beds in a nursery that previously had infestations of *Phytophthora cinnamomi* appear now to be free of the pathogen (i.e. eradicated) after treatment with granular Ridomil® and 3-years inter-rotation with pasture.

Eucalypt species

Pests

No insect problems in Tasmania.

Pathogens

No disease problems were reported.

URBAN, RURAL AND AMENITY.

The European wasp, *Vespula germanica* and the common wasp, *Vespula vulgaris* are causing severe problems at many Tasmanian forestry operations and visitor facility sites. Forestry Tasmania has a developing tourist infrastructure which includes the Tahune Airwalk (200,000 visitors in 2002/2003), Dismal Swamp Slide and numerous picnic and camping parks. The populations of vespulid wasps during the late summer months has a detrimental impact on visitors and also impacts on forestry gangs performing operational activities such as roading, pruning etc. Forestry Tasmania uses an insecticide baiting system to reduce wasp populations prior to forestry operations and at forestry tourism sites. Use of the system is limited by insecticide registration difficulties.

Gum tree scale (*Eriococcus* spp.) was commonly reported on garden and wood lot eucalypts during the summer months.

Uraba lugens is a common tree pest of eucalypts in gardens and dry forest areas.

Sawflies, mainly *Perga affinis*, caused considerable damage to roadside planting's in the central midlands of Tasmania.

Phoracantha mastersi caused many eucalypt deaths in drought effected areas especially in remedial planting's.

The Elm Leaf Beetle (*Pyrrhalta luteola*) has spread to most elm trees in the City of Launceston Parks and Gardens. Population numbers are low. To date control measures have not been introduced. ELB not been detected out of the City boundary and has not yet been detected in Hobart. Council officers in Hobart conduct several surveys a year.

QUARANTINE

The delta trap-monitoring program for the detection of Asian Gypsy Moth continued to be conducted at Tasmanian seaports. The iron ore facility at Port Latta in NW Tasmania is now included in the program. A total of 130 traps were established for the six month trapping period of October to March.

The port surround monitoring system trial at Bell Bay, using static traps for the detection of exotic timber insects has been completed. The system has now been adopted by Quarantine Tasmania, for use in areas around international shipping ports in Tasmania.

SOUTH AUSTRALIA

PLANTATIONS

Pinus spp.

Insect Pests

Sirex

In the Green Triangle Region:

- *Sirex* remains at a very low level in this region.
- A total of 158,000 ha have been inspected.
- Little *Sirex* activity found. Some deaths in wind damaged areas and lightening strikes.
- Evidence of *Sirex* found in trees burnt in fires over the last two years and some lightening strikes.
- Surveillance flights are conducted over July/August each year.
- Establishment of trap tree plots and inoculation program continuing. Has been difficult finding sites that fit the criteria for trap tree establishment - few plots of appropriate age remain unthinned.
- 11 million nematodes distributed in the South East plantations.
- Parasites: Ibalia is main species emerging from billets. No *Schlettererius* recorded emerging from billets this year.

In the Ranges Region:

- *Sirex* is present in all forest districts throughout the Ranges region.
- The *Sirex* population at Second Valley Forest has continued to decrease. The majority of *Sirex* emerged from billets from a single location at Second Valley. A significant number of *Ibalia* (and some *Megarhyssa*) were also recorded from this site.
- There have been few reports of *Sirex* at Mt. Crawford Forest..
- No emergences recorded for the Northern forests though reports were received of exit holes in timber delivered to the mill.
- Nematodes present in *Sirex* emerging from trap tree plots at Mt Bold.
- No *Schlettererius* were found this year.

IPS

In the Green Triangle Region:

- *Ips* is very much a secondary pest in this region. There have been no reports of damage though Ips can be found throughout the region in dead trees.

In the Ranges Region:

- *Ips* continues to be a major problem in the Northern forests of Bundaleer and Wirrabara. This follows a hot dry summer with large areas being clearfelled.
- At Mt Crawford, *Ips* is present at moderate levels with several deaths in scattered areas .
- At Kuitpo and Second Valley, *Ips* is present at very low levels with only one isolated attack being reported.

Essigella

- In the Green Triangle Region *Essigella* has caused considerable damage this year. Damage has been moderate to severe in 15-50 year old plantations with some younger pines also affected. The extended dry, warm autumn and short, warm winter is thought to have contributed to high numbers being present for a longer than normal period. It is estimated that there has been 10-15% defoliation in thinned stands across all but the coastal plantations. Defoliation was most severe on drier inland sites (lower rainfall and deep sandy soils) where nutritional status is marginal. A marked effect again noted was that thinned stands that had received fertiliser in the past couple of years were much less affected than unfertilised stands. However even in these stands there was some lower crown needle loss in late autumn due to the extended aphid activity throughout May.
- In the Ranges Region *Essigella* has caused negligible damage with high numbers of ladybirds being recorded.

Diseases

There have been no disease problems reported this year.

***Eucalyptus* species**

Insect Pests

Autumn Gum Moth

- Autumn Gum Moth continues to be a major pest of 1-3 year old bluegums in plantations. They are present in virtually all bluegum plantations and cause varying amounts of damage.

Chrysomelid beetles

- Chrysomelid beetles are also important pests in eucalypts plantations in the Green Triangle region. They are present in all plantations and control measures are occasionally necessary.

Sawflies

- Sawflies (*Perga* sp.) have been present in large numbers in some plantations this year. Control measures have been taken in some instances.

Diseases

There have been no reports of diseases in eucalypts this year.

NURSERIES

There have been no reports of pest or disease problems in nurseries this year.

NATIVE PLANT COMMUNITIES

A new book on Dieback in the South East has been released. This documents symptoms of dieback and discusses the many causes.

Phytophthora: This continues to be a major issue in the Mount Lofty Ranges. The "Phytophthora Management Guidelines" that was first published in 2003 has been updated by the Phytophthora Technical group and will be available on the http://www.deh.sa.gov.au/ website.

FOREST HEALTH SURVEILLANCE

Flights to detect *Sirex* (and other pine deaths) continue to be carried out each year in the Green Triangle Region. Surveillance of pine forests in the Ranges Region is carried out by staff of ForestrySA on the ground.

RESEARCH & DEVELOPMENT

ForestrySA is collaborating with SARDI (South Australian Research and Development Institute) on a project for the biological control of *Essigella*. This is a 5 project involving the importation, assessment and hopefully, release of a wasp parasitoid of *Essigella*.

WERSTERN AUSTRALIA

PLANTATIONS

Pinus spp.

Insect Pests

Sirex

The installation of detection and monitoring systems for Sirex will recommence in December 2005. (FPC)

Ips grandicollis

No reports on high numbers have been received for this past year. (JF, FPC)

Monterey Pine Aphid (Essigella californica)

Nothing to report.

Pinus Pinaster

Wingless Grasshopper (Phaulacridium.sp)

November 2004 to January 2005 Midwest plantations had incursions of Wingless grasshopper on plantations in the Brookton, Muchea and Gingin areas, misting with alphacypermethrin was undertaken on affected properties on a fortnightly basis approx 250ha misted and baited. (FPC)

Rutherglen Bug (Nysius vinitor)

October to late December Midwest plantations misted approx 250ha in conjunction with wingless grasshopper control. (FPC)

Port Lincoln (28) Parrot

Trapping and shooting has taken place in the Midwest Plantation areas over the last 12 months on 4 properties. (FPC)

Diseases

No major problems reported.

Eucalyptus species

Insect Pests

Psyllids

The blue gum psyllid is common across the plantation estate but has not been a significant pest during 2004-05. (FPC, GSP, APFL, WAPRes, Timbercorp)

Autumn gum moth

Autumn gum moth has not been a significant pest during 2004-05. This species occurs mostly around Albany, especially east of Albany. Adults are observed mostly in March and April. A plantation east of Albany received severe damage in 2002, and a high density of late instar larvae were found in the same plantation in July 2003. In other plantations, a virus killed most late instar larvae. Diversity of parasitoid wasps of AGM seems to be limited in SW WA. (FPC, GSP, APFL, WAPRes, Timbercorp)

Leaf beetles

Although *Cadmus* and *Chrysophtharta* have not been considered to cause significant defoliation, adult beetles of these species were found to cause nearly as much defoliation of growing tips in January – March as larvae of *Eucalyptus* weevil in October. The damage by the adult beetles was detected in two year old plantations around Albany. There were no observation from other plantations, and therefore, the status of these beetles in other plantations is unknown at present. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Eucalyptus weevil

Weevil control was carried out on at least 3500 Ha with the ages varying from 2 to 4 years old. This species is continuing to expand its range northward and westward. During the annual population assessment in late September to early October, the number of egg cases per shoot tended to be much greater in 2004 than in previous years. Because of poor weather conditions, very small number of plantations were sprayed or misted in 2004; however, damage levels were low to modest, even in plantations in which the egg case numbers were high enough to rigger spraying but not sprayed due to poor weather. Along with chrysomelid beetles and *Heteronyx* beetles, adult *Eucalyptus* weevils defoliate tips of trees in January – March. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Heteronyx spp

Only a small number of plantations were defoliated by *Heteronyx* beetles in 2004-05. This is possibly due to dry summer, making it difficult for adult beetles to emerge from their pupation chambers. A species of small scarab beetle (probably *Heteronyx* sp.) was observed feeding on new leaves near tree tops at one plantation east of

Albany. This species has never been found feeding on blue gum. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

African Black Beetle (Heteronychus arator)

The use of "socks" on seedlings prior to planting in known african black beetle areas continues to be effective. The impact of this insect has now been reduced to nil. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Leaf Blister Sawfly

Very little damage was caused by LBS in Great Southern and South Coast in 2004-05. There was moderate damage by LBS around Esperance (the information has not been available previously.) (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Wingless Grasshopper

Wingless grasshoppers caused damage in P2004 plantations from Bremer Bay to Esperance. (GSP, ITC)

"Spring" Beetle (Liparetrus jenkinsi)

Damage caused by this species in 2004-05 was roughly equivalent to that in 2003-04. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Diseases

Mycosphaerella

Mycosphaerella predominantly causes damage to the juvenile leaves of blue gums. Plantations east of Albany affected by AGM and LBS are often also affected by *Mycosphaerella*. Another high risk area is near Northcliffe. *Mycosphaerella* is also found throughout the region at low levels. Damage by *Mycosphaerella* was less extensive and intensive in 2004-05 than in the previous season. Seedlings seem to be infected in nursery. (FPC, GSP, APFL, ITC, WAPRes, Timbercorp)

Research at Universities continues on *Mycosphaerella* leaf blights and *Endothia gyrosa* and other cankers in *Eucalyptus globulus* plantations (see Research and Development).

MANAGED NATURAL FORESTS

Eucalyptus marginata

Jarrah leaf miner

Jarrah leaf miner is still in outbreak in some areas of the central and northern Jarrah forest. The northern boundary of JLM infestation was surveyed in October 2004. No significant northward movement of the infestation had occurred. It is anticipated that the next survey will be conducted in October 2009. Maintenance of a project investigating the control of Jarrah leaf miner through selective retention of resistant trees continues. (A. Wills, T. Burbidge).

Uraba lugens

Populations of gum leaf skeletonizer (*U. lugens*) remain low in the southern Jarrah forest. Isolated populations were encountered in Surprise forest block near Walpole in Dec 2004. (JF)

Biodiversity study (Forestcheck)

The biodiversity study FORESTCHECK, has now completed its 4th sampling season with over 1200 morpho-species collected. A new study investigating the impact of mosaic burning on native forest has been initiated near Walpole incorporating a range of 3 forest site types. (JF)

Jarrah forest (Eucalyptus marginata)

No new major pathological problems reported. Management and survey of *Phytopthora* root disease in jarrah (*Eucalyptus marginata*) forests continues to command attention (see Forest Health Surveillance and Diagnosis, and Research and Development).

Karri forest (Eucalyptus diversicolor)

No new major pathological problems reported. Management of *Armillaria* root disease in karri (*Eucalyptus diversicolor*) continues to command attention.

NURSERIES

No major problems have been reported in either hardwood or conifer seedlings in nurseries.

NATIVE PLANT COMMUNITIES

Eucalyptus wandoo

The Wandoo Response Group continues to coordinate research into the wandoo decline. In 2005 a public forum and a scientific workshop were held to set future directions for research responses to Wandoo decline. Research by UWA on disease, entomological and environmental factors is ongoing. (A. Wills)

Corymbia callophylla

Lerps of what looked to be *Cardiaspina fiscella* were found on *C. callophylla* near one of the rubbish dumps near Albany. The species will be confirmed in early October 2005 by G. Taylor of Adelaide University (he is currently on leave). This may prove to be a new host record. *Cardiaspina fiscella* was first found in WA in Albany during November 2001 on *E. robusta*, and subsequently found to be widely distributed on eastern states eucalypts in the state's southwest. (M. Matsuki, JF)

Thirty three sites covering a total of 485 ha (the highest total since the inception of the program) were aerially sprayed with phosphite in 2005, comprising 225 ha in Fitzgerald River National Park, 175 ha in Stirling Range National Park and on coastal reserves near Albany and 85 ha on nature reserves and in State forest south of Busselton. Monitoring of individuals and populations of threatened flora, and positions of *Phytophthora* 'fronts' continues to show beneficial effects of the application of phosphite. The nine-year study of average rate of spread of a *Phytophthora* front in *Banksia* woodland near Albany shows that phosphite application reduced the average ROS by more than 65% over the period (R. Smith, CALM).

URBAN AND RURAL

Mundulla Yellows

Monitoring of the occurrence and symptom development of Mundulla Yellows (MY) in WA has continued. Symptomatic eucalypts (both planted trees and remnant native trees) have been observed in several additional locations. Spread of symptoms within affected sites appears generally to be slow. The observed distribution of MY symptoms in the south of the state is from north of Geraldton to Esperance. Tests of foliar samples from symptomatic trees for "MY-RNAs" (by D.Hanold, The University of Adelaide) all gave positive results. Nutrient analysis of soil and foliar samples from MY-affected and nearby asymptomatic eucalypts at various locations has been completed. As in South Australia, MY is only seen in vegetation in disturbed sites or modified landscapes such as road verges and medians, parks and gardens, and in parkland or paddock remnant stands. Symptoms have not been observed within undisturbed native forest or woodland stands in WA. CALM is an Industry Partner in a three-year ARC Linkage project at The University of Adelaide, "A comparative study of the distribution and spread of potential molecular markers for Mundulla Yellows disease." (M.Stukely, CALM).

Tuart decline

In recent years, tuart (*Eucalyptus gomphocephala*) woodland within Yalgorup National Park, south of Mandurah has suffered a severe decline in health. Research carried out by The Tuart Health Research Group (THRG) has shown from surveys of tuart across the range, that the major decline syndrome is confined to Yalgorup N.P. These sites show a high correlation with higher rainfall, finer and shallower soils, higher groundwater alkalinity and salinity, and a greater rate of groundwater salinity increase (T. Edwards - Edith Cowan University). Critical water potentials for loss of

xylem function were rarely breached in any size class or location within YNP over the past 20 months (P. Drake - Edith Cowan University). Fine feeder root necrosis has been observed on trees showing decline and a number of Phtophthora and Pythium spp. have been isolated from these roots (P. Scott, Murdoch University). There have been fewer mycorrhizal pads associated with fine roots of declining trees c.f. healthy trees and tuart showing symptoms of severe decline in YNP have different foliar nutrient profiles than trees growing outside YNP that are in good health (N. Moore - Murdoch University). Preliminary studies on the role of fire and competition indicate tuart seedlings growing on ashbeds exhibit greater rates of survival compared to those grown off ashbeds and Agonis flexuosa (W.A. Peppermint) is not alleopathic to tuart and does not significantly alter the growth of tuart seedlings due to competition (R. Archibald, Murdoch University). All results at this stage are preliminary and further work is being carried out by the research group (P. Barber, Murdoch University).

Wandoo Decline

In recent years the health of Wandoo (*Eucalyptus wandoo*) woodland has been affected by crown decline, sometimes resulting in the death of declining trees. The Wandoo Recovery Group was established in 2003, and recently a Wandoo Strategy and Action Plan was developed. Insects and fungal pathogens are associated with the decline, but rainfall deficit, salinity, waterlogging, altered fire regimes and agricultural practices are also thought to be contributing to the decline. Government and community based action is underway to map the extent of decline, and monitor trends in the health and condition of wandoo forests (Wandoo Recovery Group, Bulletin No.2, March 2005).

Foliar pathogens

A new species of *Mycosphaerella* has been isolated from tuart and is currently being described. It is associated with minor spots on the foliage and does not appear to be widespread. Post-fire regenerating tuart has been severely defoliated by *M. cryptica* in Yalgorup National Park, Ludlow State Forest and Yanchep National Park and has contributed to tree deaths in Yalgorup National Park. Trials monitoring the incidence and severity of *M. cryptica* and insect pests on regenerating seedlings of *E. gomphocephala* have been in progress over the last 12 months. These are being combined with growth data and soil characteristics (P. Barber, Murdoch University).

FOREST HEALTH SURVEILLANCE AND DIAGNOSIS

Dieback mapping and management

In the period July 2003 to June 2004, CALM Forest Management Branch mapped the presence of *Phytophthora cinnamomi* disease symptoms and defined protectable areas on 22,600 ha of native forest. Approximately 13,200 ha of previously mapped forest was rechecked. Numerous development projects on CALM managed land were assessed for dieback hygiene planning. A variety of disease mapping and inspections were carried out for other government agencies and private companies or individuals. Prescriptions for planning of silvicultural operations were modified based on considerations of *P. cinnamomi* impact on vegetation complexes. These complexes

were mapped out in proposed harvest areas and harvesting activities were modified where dieback impact was expected to be high. Training programs were delivered for both Disease Detection and Hygiene Management. Strategic disease interpretation was carried out for risk assessments of biodiversity assets and community values (see Native Plant Communities) (G. Strelein, CALM).

Between 1st July 2004 and 30th June 2005, a total of 1,250 samples were processed for *Phytophthora* identification by CALM's Vegetation Health Service (VHS). A small number of other tree health and nursery problems were investigated. (M.Stukely, CALM).

QUARANTINE

European House Borer (Hylotrupes bajulus)

This beetle is regarded as one of the worlds' most destructive pests of seasoned pine. In January 2004 EHB larvae were found emerging from a feature beam in a private house in the Perth Hills suburb of Parkerville. This prompted the formation of the State Pest Control Head Quarters (EHB Working Group). Surveillance has resulted in the location of infestations in four of the Forest Products Commission's (FPC's) plantations: Gnangara, Helena, Greystones and Peel, plus a seed orchard at Rottnest Island. Surveillance of over 100,000 hectares of plantation estate and urban areas (below the 26th parallel) has been conducted twice over approximately the past twelve months, indicating the incursion is contained to the greater Perth Metropolitan Area. Since detection two flight seasons have occurred. Concurrent containment activities are being conducted in urban and plantation environments including chipping and burning of infested material, and removal of susceptible material in buffer zones around infested sites. A strategic plan for the long-term hygiene of plantations, encompassing management, and hopefully eradication from affected plantations is in the process of being developed and implemented. (FPC)

RESEARCH AND DEVELOPMENT

Plantations

Eucalyptus globulus

Forest health surveillance

Several projects at Murdoch University are focusing on eucalypt plantation health and risks to biodiversity of native forests in Australia. In the past 12 months surveys have been conducted in collaboration with State departments and private forestry companies in eucalypt plantations in QLD and NT. The surveys provide a framework for a database on disease already present in Australia. A database of exotic eucalypt diseases and their proximity to Australia and the risk they pose to Australia's forests and industry is being compiled. A number of diseases are of particular interest, Phaeophleospora destructans, Coniothyrium zuluense and Cryphonectria cubensis. Molecular markers are currently being developed for P. destructans and are already in existence for C. zuluense and C. cubensis (through collaboration with the Forestry and Agriculture Biotechnology institute in South Africa). These markers will be used to

determine the origin, diversity and movement of potentially destructive eucalypt diseases

The IPMG (Industry Pest Management Group) jointly funded by the forestry CRC and bluegum plantation companies is now administered through Murdoch University. The group employs an insect ecologist Dr Mamoru Matsuki, who primarily focuses on major pest problems. However, he is constantly in the plantation estate and is vigilant for any changes or observations of new diseases

We are also focussing on the exchange of pathogens between native forests and bluegum plantations in Western Australia. We have shown that some Botryosphaeria spp.,endemicto WA have moved into the plantations. In the new forestry CRC we will be studying the movement of Mycosphaerella spp. into WA and between forests and plantations (T. Burgess, Murdoch University).

Diseases

Work under the following grants is in progress at Murdoch University.

Collaborative Project - Murdoch University and the Tree Pathology Cooperative Program (Sth Africa)

'New and emerging pathogens threatening the biodiversity of Australia's eucalypts'. This project is concentrating on some of the major eucalypt pathogens worldwide, (Phaeophleospora spp. Mycosphaerella spp., Botryosphaeria spp. Cryphonectria spp.) with the aim of determining their origin, movement and the risk they pose to Australia's eucalypts. (T. Burgess, MU, M. Wingfield, TPCP).

PhD Theses in progress at Murdoch University

Taxonomy and biology of Mycosphaerella species found on E. globulus. (Sarah Jackson; supervisors, G. Hardy and B. Dell, MU)

The cause of basal stem rot in second rotation Eucalyptus globulus plantations (Francisco (Paco) Tovar, Supervisors T. Burgess, G. Hardy, MU and R. Robinson, CALM).

Vera Andjic The movement of Phaeophleospora destructans throughout Asia, a potential threat to Australias forests and plantations (supervisors T. Burgess, G. Hardy and M.Wingfield).

Paulownia Plantations

ARC Linkage. Diseases of Pawlonia. (Kirsty Bayliss, Postdoc MU)

Honours Theses

Botryosphaeria spp. associated with trees in healthy and declining tuart stands; identification, pathogenicity and potential role in decline (Kate Taylor, supervisors T. Burgess and P. Barber, MU).

Managed natural forests

Corymbia calophylla

Diseases

G. Hardy, MU, Bryan Shearer, CALM and Jen McComb, MU). Part funded by Forest and Wood Products Scholarship.

A severe canker disease has been associated with decline and dieback in Corymbia calophylla (marri) across their natural range in the south west of Western Australia for several years and this project has investigated the severity, extent and possible causes of the disease. Initial surveys found cankers present on marri at all examined sites, with lesions occurring on trunks, branches and twigs of trees of all age classes. There were significantly more cankered trees at remnant sites (roadside or paddock trees) than in state forest (47.3% and 16.1% respectively, $p<0.05$). Cankers had led to tree death at a number of sites. Subsequent revisits to the sites monitored lesion expansion and tree decline. Over the period of the study lesions were observed expanding, trees continued to decline, and a number died. Isolation from healthy and cankered marri have found a total of 39 fungal species, the most common being endophytes and secondary or opportunistic pathogens including Endothiella eucalypti, Favostroma cryptica, Cytospora eucalypticola, Alternaria sp. and Cladosporium herbarum. A potential primary pathogen, Quambalaria sp. was also isolated. We are currently working to determine whether the WA isolates represent a species complex, along with their relationships to eastern Australian and South African species. Ultimately we wish to determine whether Quambalaria sp. is endemic to marri in the southwest, and if so, why it has become such a serious pathogen in recent years (T. Papp – MU).

Honours

Biology of Quambalaria on C. calophylla and C. ficifolia. (Julie Ellery, Supervisors; G. Hardy, J. McComb and T. Papp, MU)

Jarrah forest (Eucalyptus marginata)

Diseases

Dieback-resistant jarrah (Eucalyptus marginata): Field trials of jarrah clones selected for resistance to Phytophthora cinnamomi are being written up. Trials of site preparation procedures for re-establishment of jarrah in dieback "graveyard" sites commenced in 2003 with further trials established in 2004. Final planting of a production seed orchard of dieback resistant jarrah clones at the Forests Products

Commission's Plant Propagation Centre near Manjimup has been deferred pending the availability of clones. (M.Stukely, CALM).

Work under the following grants is in progress at Murdoch University.

SPIRT Large. 2000-2003 at $300,000 (Industry partners CALM, Alcoa, Worsley Alumina, CSIRO). Will Phytophthora cinnamomi become resistant to the fungicide phosphite? Its implications. (This study examines plant and fungal interactions at a genetic level). (Investigators: Giles Hardy-MU, Inez Tommerup-CSIRO, Phil O'Brien, MU, Bryan Shearer, CALM, Ian Colquhoun, Alcoa World Alumina, and Mark Dobrowolski, Postdoctoral Fellow).

Linkage ARC Large. Industry Partners Alcoa World Alumina, Worsley Alumina and Department of Conservation and Land Management. The ability of the fungicide phosphite to stop the autonomous spread of Phytophthora cinnamomi in the Eucalyptus marginata forest. Post-doctoral fellow: Bill Dunstan (Investigators: G. Hardy, B. Dell, M. Calver, J. McComb, MU I. Colquhoun, Alcoa World Alumina and B. Shearer, CALM)

PhD Theses in progress at Murdoch University

Long term survival of Phytophthora cinnamomi in rehabilitated bauxite mines and adjacent Eucalyptus marginata forest. This project is looking at chlamydospore dormancy and saprophytic growth. (Sarah Collins; Supervisors, G. Hardy, MU and B. Shearer, CALM). Funded by ARC LINKAGE

Saprophytic ability and long-term survival of Phytophthora cinnamomi in rehabilitated bauxite mines and adjacent jarrah forest. (Kathryn Smith; Supervisors G. Hardy, J. McComb, MU and I. Colquhoun, Alcoa World Alumina). Funded by ARC LINKAGE

The impact of Phytophthora cinnamomi on different mammal guilds in the Darling Range of Western Australia. (Rodney Armistead; Supervisors M. Garkaklis (CALM) and G. Hardy, MU).

Mechanisms of suppression of Acacia species on Phytophthora cinnamomi (Arunodini Jayasekera; supervisors B. Shearer, CALM, J. McComb and G. Hardy, MU)

Karri forest (Eucalyptus diversicolor)

<u>Diseases</u>

In 2004-05 approximately 210 ha of high quality karri forest was thinned in Warren forest block, 105 ha were surveyed for Armillaria root disease and resulting in stump removal for disease control being undertaken in 88 ha (M. Dybala, FPC).

Analysis of a karri regrowth thinning experiment infested with Armillaria lutebubalina has shown that 15 years after thinning, the growth of infected trees was not significantly different from that of healthy trees but in the treatment thinned to 200 sph mortality was 3 times higher than in the corresponding trees in the unthinned plots and up to 50% of the total gain in volume was lost to defect (R. Robinson, CALM).

AUSTRALIAN CAPITAL TERRITORY

PLANTATIONS

Note: A large proportion of the pine estate was burnt in the 2003 fires.

Pinus spp.

Insect Pests

Sirex Wood Wasp (Sirex noctilio)

The incidence of naturally struck trees is very low in ACT Forests pine plantations, following the loss of 10,500 hectares of plantation in the January 2003 bushfires.

Only one *Sirex* wasp emerged from monitoring and inoculation of 38 sites in 2004, this female was infected with nematode. ACT Forests' *Sirex* inoculation and monitoring prior to January 2003 consistently produced hundreds of emergent wasps with nematode infection rates of over 50%. It is believed that the January 2003 bushfires have greatly reduced the population of *Sirex* wasp in the ACT. Monitoring is now restricted to those areas with significant live pine plantations; Kowen, Majura, Tuggeranong, and Miowera forests.

Five Spined Bark Beetle (Ips grandicollis)

There were no occurrences of *Ips* observed in the pine plantations in 2004/5.

Wingless Grasshopper (Phaulacridium vittatum)

There were no outbreaks of wingless grasshoppers observed in the pines in 2004/5.

Monterey Pine Aphid (Essigella californica)

The area affected by *Essigella californica* appears to be increasing compared to previous years. This was observed as chlorosis of foliage and upper-crown needle cast, especially in older age classes.

Monitoring for *Essigella californica* has not been carried out in 2004/5.

Diseases

Dothistroma septosporum

Levels of *Dothistroma* needle blight are low and isolated to small patches or individual trees in Kowen plantation. There has not been significant change in *Dothistroma* levels over previous years.

Cyclaneusma minus

Cyclaneusma needlecast was widespread in Kowen plantation, but no significant change over previous years.

Sphaeropsis sapinea

Drought-related *Sphaeropsis* damage has eased in 2004/5 with no increase in affected areas. This is a result of improved rainfall in the last 12 months plus an increase in harvesting operations in affected areas. ACT Forests' harvesting program has been limited to thinning and clearfall operations in Kowen plantation in the last 2 ½ years following the January 2003 bushfires.

Lophodermium spp.

Species of Lophoderium are ubiquitous in *Pinus radiata* plantations in NSW/ACT. They mainly occur on older, senescing needles and are commonly observed on fallen needles. No noteworthy outbreaks occurred in 2004/5.

Macrophomina phaseolina

Macrophomina has been observed in previous years (1998) in Stromlo and Miowera forest in trees with j-root or root coil. No noteworthy outbreaks occurred in 2004/5.

Environmental

Drought

Drought severely affected the 2003 and 2004 pine plantation establishment programmes. Survival rates averaged approximately 60% in 2003, and the 2004 programme was reduced from a planned 1,300 hectares to 100 hectares.

There were no noteworthy outbreaks of drought induced Sphaeropsis in 2004/5.

Frost

There were no notable occurrences of frost damage on young plantation areas.

Nutrient

Significant areas of 2003 established plantations in Uriarra and Pierces Creek forest are showing signs of boron deficiency. A boron fertilising programme is planned but has been delayed several years for budgetary reasons. Soil analysis following the January 2003 bushfires identified most areas of Uriarra and Pierces Creek plantations as strongly deficient in Nitrogen and low to moderate in Phosphorous and Boron.

Weeds

Young age classes (1990 & 1995) at Kowen plantation remain heavily infested with *Acacia* and *Eucalyptus* species. Weeds are an increasing threat to the re-establishment of burnt plantation areas to new plantation as large areas will remain fallow for up to 5 years and beyond prior to planting. In some areas ACT Forests has applied a

prescription of chemical weed control to reduce seed set and weed establishment in plantation areas planned for re-establishment. Blackberry (*Rubus* species) is widespread throughout Uriarra and Pierces Creek plantation.

Vertebrate pests

Hares and rabbits

No shooting or poisoning of rabbits has been undertaken. Hares have browsed isolated patches of pine planted in 2005. The population of rabbits and hares has not recovered significantly in the plantation areas following the January 2003 fires, most likely due to reduction in food sources associated with the continuing drought.

MANAGED NATURAL FORESTS

Managed natural forests under ACT Forests control now includes areas that will be converted from pine plantation to native forest. These managed natural forests are along riparian corridors and adjoining National Park boundaries along steep ex pine ground. Spring 2005 is the first year of tree planting to enhance vegetation recovery in this forest. There are no notable pest or disease issues in 2005.

NURSERIES

ACT Forests' does not operate any nurseries. There are no known pest or disease outbreaks from any commercial nurseries that supplied ACT Forests with *Pinus radiata* and native tree seedlings in 2005.

NATIVE PLANT COMMUNITIES

No noteworthy disease outbreaks were recorded in native forests in the ACT in 2005.

URBAN AND RURAL

No noteworthy disease outbreaks were recorded in urban and rural areas within the ACT Forests estate in 2005.

NEW ZEALAND 2004/2005

Collated and summarised by J. Bain, L. Bulman, M. Dick and D. Jones (Ensis) from data and information from the Forest Health Database, *Forest Health News* (Ensis), the Forest Health Reference Laboratory Diagnostic Services, and other Forest Biosecurity and Protection staff (P. Crane, K. Dobbie, J. Gardner, I. Hood, D. Kriticos, S. Mansfield, M. Watson and T. Withers).

PLANTATIONS

Pinus radiata

Pests

No insect problems of any note were recorded in *P. radiata* plantations. The status of *Essigella californica* (Aphididae) in NZ is equivocal. We are establishing a study to gauge the coincident effects of *E. californica* and *Cyclaneusma minus* on growth rates of *P. radiata* at two sites with contrasting climates.

Diseases

Dothistroma needle blight

Records of Dothistroma needle blight confirmed a slight increase in disease severity in 2004, compared with the level reported for 2003. Disease was severe in 2002, as a result of high rainfall in the 2001/02 summer. The total number of records, and those where severity was greater than 25%, increased in 2004 (figure 1).

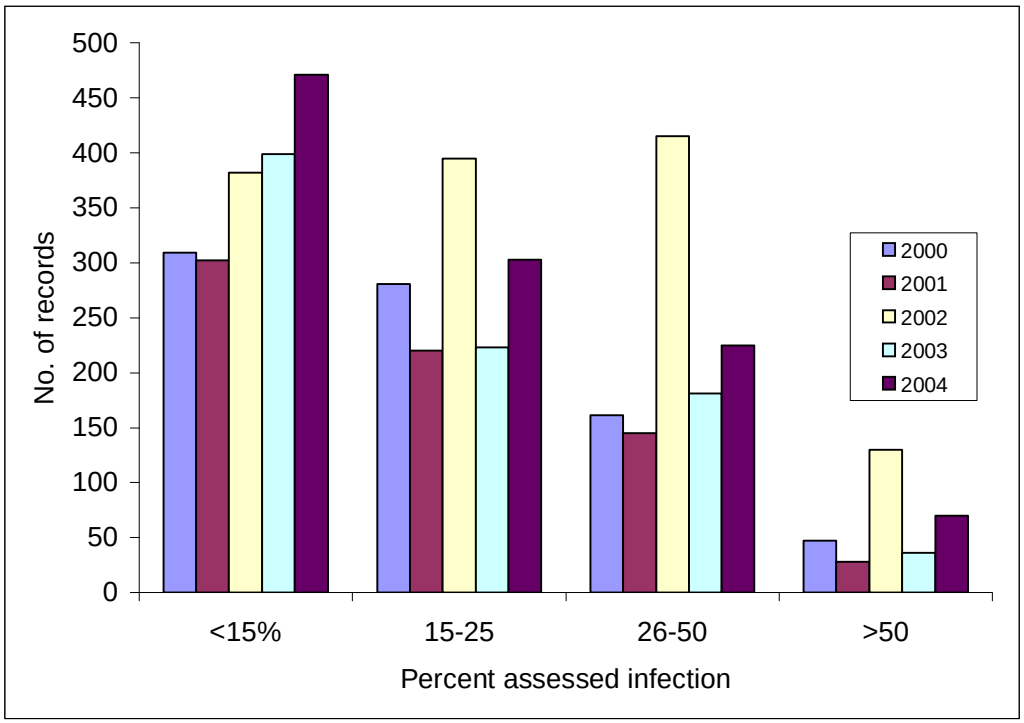

Figure 1 - Forest Health Database records of *Dothistroma pini* during the period 2000-2004

The aerial spray programme in the North Island for 2004-2005 at 72,688 ha was marginally greater than the previous season when an area of 69,724 ha was sprayed, (figures provided by the Dothistroma Control Committee). The 2002-2003 spray programme was the largest ever undertaken at 182,290 (figure 2). The area sprayed is a separate, but less refined indicator of the annual impact and extent of Dothistroma needle blight throughout the whole country, since it may be influenced by other forces driving company activities (for example: budget constraints, changes in silvicultural practices, increasing area of at-risk age classes due to greater planting in the 1990s).

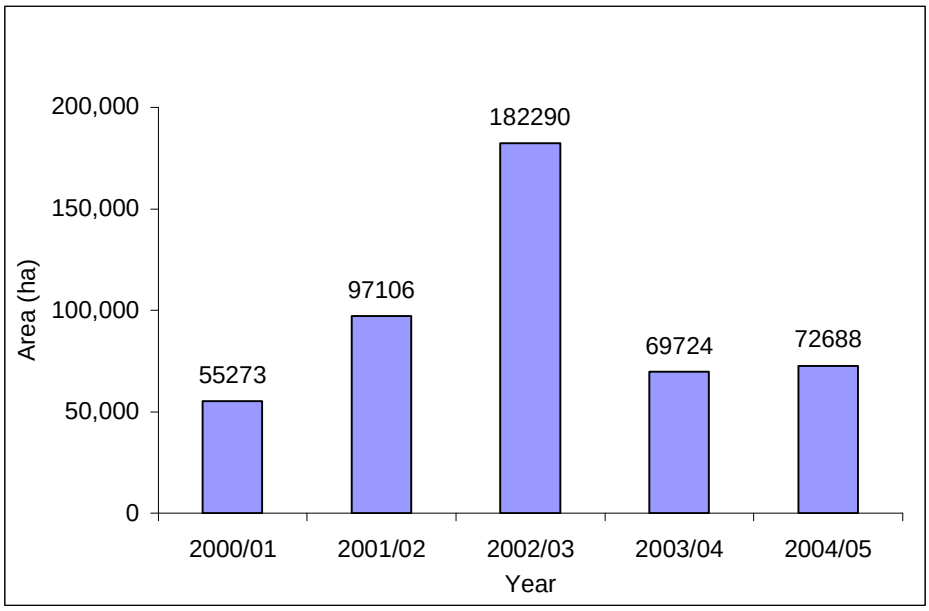

Figure 2 – Area sprayed annually for Dothistroma control in the North Island

Cyclaneusma needle cast

Based on Forest Health database records, the severity of Cyclaneusma needle-cast was again low, as it was in previous seasons (figure 3). Disease severity was less than 15% for almost 70% of the Cyclaneusma needle-cast records for the last four years, compared with almost 50% of the records for the one year before that. These lower disease levels are attributed to the dry conditions experienced over much of the country during the four autumn periods. These data must be viewed with caution, because only 17% of records in the database were collected during the peak Cyclaneusma needle-cast expression period of September/October/November. The main infection period is summer for *Dothistroma* and autumn for *Cyclaneusma*.

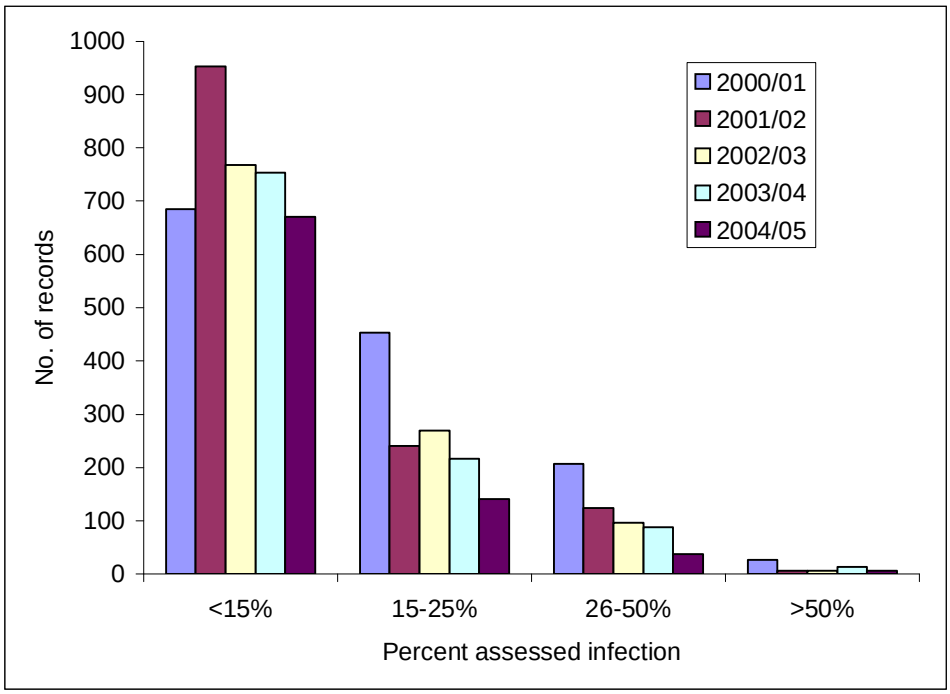

Figure 3 - Forest Health Database records of *Cyclaneusma minus* during 2000/01-2004/05

Physiological needle blight

Very few reports of the physiological needle blight (in the past often referred to as 'Strasseria-associated needle cast') were made in 2004. Isolated events were recorded in localised areas of individual stands in the occasional forest in Auckland, Bay of Plenty, Taupo, and Wellington.

Nectria fuckeliana

A nationwide survey to look for stem fluting and other signs of Nectria disease outside the known infected area was carried out this year. A total of 202 stands were inspected and fluting was seen in 13%. Samples were taken from fluted trees and *Nectria fuckeliana* was not isolated. The incidence of fluting recorded during the national survey was markedly lower than that found in the known infected area. There was almost no expansion of the range of *Nectria fuckeliana*, the most recent record was made at Te Moana, about 7 km WNW of the previous northernmost find. The fungus is still confined to the lower half of the South Island. A profile of the basic biology of *Nectria fuckeliana* is emerging as a result of field and laboratory observations and experiments. Fruiting bodies, which appear on infected branch stubs and stem cankers, contain viable spores in all seasons of the year. Ascospores can germinate at a broad range of temperatures, from 5 to 28 °C, although at either end of the scale germination is very slow or abnormal. Spore dispersal appears to be primarily through water-splash. Studies on the effect of silviculture, stub treatment,

and environment on disease development are continuing. Disease susceptibility of other conifers and of *Pinus radiata* nursery plants is also being examined.

Armillaria root disease

Armillaria root disease, caused primarily by *A. novae-zelandiae*, remains widespread in many pine plantations through much of the country. *Armillaria limonea* also contributes to losses in first rotation stands planted on sites cleared of native forest. In second or third rotation stands mortality of young trees is less common. However, chronic, non-lethal infection of older trees can still lead to significant increment loss.

NURSERIES

Root rot caused by *Phytophthora cinnamomi* was the most common serious nursery disease. Outbreaks were recorded in nurseries in warmer regions in both the North and South Islands.

Douglas fir (Pseudotsuga menziesii)

Diseases

Phaeocryptopus gaeumannii (Swiss needle cast disease)

Swiss needle cast disease (*Phaeocryptopus gaeumannii*) was again recorded throughout New Zealand and remains the most significant disease of Douglas fir.

Eucalyptus spp.

Pests

Creiis lituratus (Psyllidae)

Creiis lituratus (Psyllidae) was first found in New Zealand in June 2002 and is still confined to urban Auckland. In August 2004 *C. lituratus* was recorded for the first time from *Eucalyptus major* in New Zealand. Other known hosts in New Zealand are *Eucalyptus botryoides, E. grandis* and *E. saligna.*

Acrocercops laciniella (Gracillariidae)

Acrocercops laciniella (Gracillariidae) was first recorded in New Zealand in January 1999. It is a significant pest in coastal New South Wales, where it causes outbreaks of damage from time to time on *Eucalyptus pilularis. A. laciniella* has a wide host range, which also extends to species within the eucalypt sub-genus *Symphyomyrtus.* It has spread quite rapidly throughout the North Island and in June 2004 was found in the South Island (Nelson) for the first time. It has since spread and in June 2005 was found in Marlborough (South Island).

Enoggera nassaui (Pteromalidae)

Enoggera nassaui (Pteromalidae) is an egg parasitoid introduced into New Zealand in the late 1980s and again in 2000 for the biological control of the eucalyptus tortoise beetle *Paropsis charybdis* (Chrysomelidae). In 2001 an obligate hyperparasitoid of *E. nassaui, Baeoanusia albifunicle* (Encyrtidae), was detected in New Zealand. That same year, another egg parasitoid of *P. charybdis* was recorded in New Zealand, the wasp *Neopolycystus insectifurax* (Pteromalidae). Attack rates of the two egg parasitoids and the hyperparasitoid have been monitored since the summer of 2001-02. Each summer *P. charybdis* egg batches were collected from several *Eucalyptus nitens* plantations in the Bay of Plenty/Taupo region. For the 2004-05 summer, three plantations were monitored. Parasitism by *E. nassaui* increased from November to January then declined in February at all three sites. At two sites the hyperparasitoid followed a similar trend in abundance to *E. nassaui* while *N. insectifurax* was not collected until January, when they too began to increase in abundance. Neither *B. albifunicle* nor *N. insectifurax* have been recorded from the third site. These trends are generally similar to those observed in previous summers, although *B. albifunicle* was recorded earlier in the summer at one of the sites than previously.

It appears *E. nassaui* will be effective in reducing *P. charybdis* populations in early summer and that *N. insectifurax* can provide some control of the second generation in late summer. In previous years *E. nassaui* attacked the second generation, but the hyperparasitoid now reduces the impact of *E. nassaui* on this second generation. *N. insectifurax* (where it is present) appears able to compensate to some extent for the decline of *E. nassaui* populations.

Uraba lugens (Nolidae)

Uraba lugens (Nolidae), which was first found in New Zealand in 1992 at Mount Maunganui and then in Auckland in 2001, is now very widespread in the latter locality and some sites have very large populations. It is now considered to have been eradicated from Mt Maunganui as it has not been found there since early 2001. *U. lugens* is now the subject of a containment strategy in Auckland and its spread is being monitored using pheromone traps, the pheromone having been identified by HortResearch.

Approval was granted by the Environmental Risk Management Authority (ERMA) to import four candidate parasitoids from Australia (*Cotesia urabae, Dolichogenidea eucalypti* (Braconidae), *Euplectrus* sp. (Eulophidae) and *Eriborus* sp. (Ichneumonidae)) which may be suitable control agents for *U. lugens*. Several collections were made in Tasmania and South Australia from November 2004 to January 2005. Hyperparisitoids have hindered culture development for three of the four parasitoids, particularly *D. eucalypti*. Generally, it has proven difficult to establish viable parastioid cultures in containment, although one species (*C. urabae*) did survive for three generations. Some host specificity tests have been conducted against *C. urabae* and *Eriborus* sp. No adverse responses to non-target species have been recorded at this stage. Additional collections are required to complete host specificity testing.

The likely impact of three existing parasitoids (*Meteorus pulchricornis* (Braconidae), *Xanthopimpla rhopaloceros* and *Anacis* sp. (Ichneumonidae)) upon *U. lugens* populations in New Zealand was also assessed. These are likely to have their greatest impact on *U. lugens* populations in the North Island. The pupal parasitoids *X. rhopaloceros* and *Anasis* sp. are unlikely to interfere directly with any of the possible host-specific control agents. However, *M. pulchricornis* has the potential to hinder the initial survival of introduced host-specific parasitoids through direct competition for hosts.

Climate modeling has determined that, subject to host availability, the potential distribution of *U. lugens* in New Zealand extends throughout most of the North Island, and in the South Island over much of the Canterbury Plains and Marlborough as well as major portions of Southland, Otago, Nelson and Tasman. This encompasses most of the eucalypt plantations in New Zealand. The phenology of *U. lugens* appears to depend upon a synchronizing factor that is as yet not understood. The behaviour of the bivoltine form of *U.* lugens in more southern, cooler sites with temperatures able to support only a single generation each year may not be straightforward to predict, and could depend upon the interaction between seasonal weather patterns and daylength. The synchronizing factor will be investigated over the next two years.

Impact assessment studies have been carried out on 19 *Eucalyptus* and *Corymbia* species considered economically and culturally important to New Zealand. All of the commercial, shelter and ornamental *Eucalyptus* species tested were susceptible to *U. lugens* larval attack to some degree, including a number of key commercial species (*E. nitens*, *E. regnans* and *E. fastigata*). Potential threats to indigenous species were completed on 27 New Zealand indigenous species. Three species, *Metrosideros carminea, Metrosideros umbellata* and *Nothofagus truncata* were within the physiological host range for larval development. Survival in all cases was significantly less than on the *E. nitens* control. Field trials have indicated that ovipostion is unlikely on these indigenous species and therefore they will not support populations of *U. lugens.* Field tests revealed that *Metrosideros excelsa* was only attacked through spill-over larval feeding when plants were in close proximity to infested Australian hosts. It has also been found on *Lophostemom confertus, Angophora costata, A. floribunda, Tristaniopsis laurina, Quercus coccinea, Q. palustris* and *Fraxinus excelsior.*

The likely impact of *U. lugens* on eucalypt productivity was modeled for *E. nitens* and *E. fastigata.* It appears likely that significant impacts will be restricted to stand boundary zones in establishing plantations (up to 7 years old), and might require two consecutive seasons with highly favourable conditions for survival and reproduction of *U. lugens*. Growers should be vigilant for large numbers of egg batches being laid on newly planted trees. Btk has been shown to be a suitable insecticide to control *U. lugens*.

Stem injection has been demonstrated to be a reliable means of treating trees to control *U. lugens* in urban situations where other application means are undesirable or inconvenient. "Soft" chemicals were shown to be unreliable in translocating and

killing *U. lugens* larvae, whereas an organophosphate (Methamidiphos, Tamaron™) proved reliable in both respects.

Diseases

Phaeophleospora and Mycosphaerella leaf disease

Phaeophleospora eucalypti was consistently the most common foliage disease in the *Eucalyptus nitens* plantations in the central North Island. Many of the trees are also infected with *Mycosphaerella cryptica* but disease levels tend to be lower than those of *P. eucalypti*. A survey conducted in April 2005 revealed that worst affected stands occur within a 20 km coastal strip in the Bay of Plenty.

CYPRESSES:

Diseases

Cypress canker (Seiridium spp.)

Cypress canker, caused by two species of *Seiridium* continued to cause damage in many cypress stands throughout the country, particularly *Cupressus macrocarpa*. The inoculation programme which is attempting to identify, and eventually utilize, genetic resistance in commercial stock continued.

BIOSECURITY

POST-BORDER (ERADICATION):

Dutch elm disease:

The eradication campaign for Dutch elm disease continued in Auckland, and was coordinated and funded by MAF supported by the local city councils. During the 2004-05 season 13 infected trees at 11 addresses were found. While most were within the infected area there was an expansion of the area to the south-west. Unfortunately, as has happened in previous years, some elms had died before they were reported to be sick and beetles had emerged from elms before they were felled and disposed of. Infected trees were found as a result of the disease detection surveys, except at one location where a special survey carried out in April successfully located infected elms. A much reduced pheromone trapping programme was carried out this season. Initially, 20 traps were deployed in high risk areas. Further traps were put in place when infected trees were identified and the number reached 47 by the end of the season. As at 20 May 2005 3,124 beetles had been caught, of which 17 (0.54%) from traps in 7 different locations were carrying *O. novo-ulmi.*

For further information see:

http://www.maf.govt.nz/biosecurity/pests-diseases/forests/dutch-elm-disease/index.htm

Fall webworm:

A fall webworm "web" (*Hyphantria cunea* (Arctiidae)) containing 15 caterpillars was found in Mt Wellington, Auckland in March 2003. Five large scale ground surveys found no more insects but in 2005 six male moths were caught in pheromone traps. The moths were trapped in February (2), March, April and June. The pheromone trapping programme is continuing.

For further information see:

http://www.maf.govt.nz/biosecurity/pests-diseases/forests/fall-webworm/index.htm.

Painted apple moth:

The painted apple moth (*Teia anartoides* (Lymantriidae)) which was first found in Auckland in May 1999 is still the subject of an eradication campaign. Last year's report stated that the last male moth trapped was in January 2004 and that trapping and vegetation controls would probably remain in place for a further two years. Unfortunately two moths have been trapped in 2005, one in May and the other in August (technically outside the scope of this report). It is unclear whether these two catches are from the existing population or represent a new incursion(s). The origins of the moths are being investigated using molecular and isotope techniques. For further details see:

http://www.maf.govt.nz/biosecurity/pests-diseases/forests/painted-apple-moth/index.htm

Asian gypsy moth:

In March 2003 a single male gypsy moth (*Lymantria dispar praetrea* (Lymantriidae)) was trapped in Hamilton. After eight aerial sprays using Btk during October and November 2003 over an area of 1250 hectares, intensive pheromone trapping and ground searches the Ministry of Agriculture and Forestry was able to announce eradication in May 2005 This was two generations after the aerial treatment was completed. For further up to date information see:

http://www.maf.govt.nz/biosecurity/pests-diseases/forests/gypsy-moth/index.htm

POST-BORDER (NEW RECORDS):

The following fungi were recorded as new to New Zealand. None were considered significant and no response action was taken. There were no new forest insects recorded this year.

In December 2004 fruit bodies *Hysterographium fraxini* were found on dead branches of *Fraxinus excelsior* in Timaru. It has subsequently been found to be quite widespread in both the North and South Islands. Overseas this fungus has been reported as being responsible for dieback of *Fraxinus* although it is generally recorded as being a facultative saprophyte. In New Zealand it is saprophytic.

In February 2005 *Colpoma quercinum* was found sporulating on dead twigs of *Quercus* sp. in Picton. It is a common saprophyte on *Quercus* in the Northern Hemisphere.

SURVEILLANCE

Forest condition monitoring

A revised forest health surveillance system

The New Zealand Forest Owners' Association (NZFOA) have instigated a new forest health surveillance scheme with the intent of providing data on forest health status while still maintaining some degree of pest detection capability. The new scheme involves assessing viewpoint plots (a stand-wide assessment of predefined disorders primarily affecting crown condition, with the aid of binoculars) and temporary health plots (transect-based plotting systems used to assess current pest status and for new pest detection). A series of high risk forest surveillance plots have also been established in areas where the risk of exotic introductions is considered to be high (about 30 over the country). Intensive pest detection surveys will be carried out at these sites. The NZFOA has put on hold a decision to proceed with a forest health condition monitoring system, pending the result of a funding application made during the year.

RECENT PUBLICATIONS AND WEBSITE FEATURES:

The monthly Ensis publication *Forest Health News* can be viewed on line. See:

www.foresthealth.co.nz.

To subscribe to this newsletter electronically, contact john.bain@ensisjv.com

The 4th volume of The Fungi of New Zealand series "Fungi on Trees and Shrubs in New Zealand" by Peter Gadgil was published this year. It is available from Manaaki Whenua Press, P.O. Box 40, Lincoln, NZ (mwpress@landcareresearch.co.nz) from within New Zealand. People outside New Zealand can purchase it from Fungal Diversity Press, Department of Ecology and Biodiversity, The University of Hong Kong (www.hku/ecology/mycology/FDRS/series/16.htm)

National Report Format 2005 for Western Australia

Pest	Area with moderate damage (Ha)					Area with severe damage (Ha)					Area inspected (Ha)	Area treated (Ha)	Hosts
	<10	10-100	100-500	500-1000	>1000	<10	10-100	100-500	500-1000	>1000			
Autumn gum moth			x					x			3400	0	*E. globulus*
Leaf blister sawfly					x	x					2900+	0	*E. globulus*
"Spring" beetles (scarabs)					x			x			6700+	1310	*E. globulus*
Weevils (defoliating)					x					x	28000+	5475+	*E. globulus*
Heteronyx (establishment)	x					x					400	0	*E. globulus*
Heteronyx (post-establishment)					x					x	29000+	100	*E. globulus*
Wingless grasshopper				x			x				11271	3167	*E. globulus*
Psyllids	Nil					Nil					nill	0	*E. globulus*
Creis periculosa										Estimate 50,000	Nil (not specifically inspected)	Nil	*Eucalyptus rudis*
Jarrah leaf miner											Nil (not specifically inspected)	Nil	*Eucalyptus marginata*
Gum leaf skeletonizer	Nil										Nil (not specifically inspected)		*Eucalyptus marginata*
Bark beetles (*Ips*)	Nil										Nil (not specifically inspected)		*Pinus radiata*
Monterey Pine aphid	Nil										Nil (not specifically inspected)		*Pinus radiata*