



IAS SURVEILLANCE – A CASE STUDY IN VIETNAM

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Outline of presentation

- Forest situation in Vietnam
- Eucalyptus plantations in Vietnam
- Situation of gall wasp associated with eucalypt plantations in Vietnam
- Surveillance of gall wasp in Vietnam.
- Minimising impacts of gall wasp in Vietnam

Forest situation in Vietnam

Year	Natural forest (1000 ha)	Forest plantation (1000 ha)	Total Area (1000 ha)	Coverage (%)
1943	14,000	0	14,000	43.0
1976	11,077	92	11,169	33.8
1980	10,486	422	10,608	32.1
1985	9,308	584	9,892	30.0
1990	8,430	745	9,175	27.2
2000	9,865	1,919	11,785	35.0
2003	10,005	2,090	12,095	36.1
2004	10,088	2,219	12,307	36.7
2010	10,300	2,900	13,200	39.1

Eucalyptus plantations in Vietnam

- In Vietnam, eucalypt plantations occupy about 400,000 ha of 2.9 million ha forest plantation and with another 50,000 ha eucalypts scattered in urban and home gardens.
- Eucalypt plantations have played an important role in economic and social development, especially in providing income for rural communities.

Eucalyptus plantations in Vietnam

- Eucalypt plantations have a short rotation of 5–7 years and thus return on investment is relatively rapid.
- The wood from forest plantations can be used for industrial materials and for the production of goods for the large international and domestic markets.

Situation of *L. invasa* associated with *Eucalyptus* species in Vietnam

- In Vietnam, *L. invasa* was first noticed in 2002, causing damage to eucalypt nurseries and young plantations in southern Vietnam.
- *L. invasa* can now be found where susceptible eucalypt clones/provenances/species are planted.

Situation of *L. invasa* associated with *Eucalyptus* species in Vietnam



Situation of *L. invasa* associated with *Eucalyptus* species in Vietnam

- At present, the commercial eucalypt plantations in Vietnam are reliant on clones: U6, PN2, PN14 of *E. urophylla* and less than six clones of *E. camaldulensis*. These clones are all seriously damaged by *L. invasa*.
- Thus surveillance on distribution, damage assessment and minimising wasp impact have been implemented in whole country.

Surveillance on *L. invasa* in Vietnam

Data collection:

- Severity, incidence, crown damage index
- Life cycle and time of occurrence of pest
- Area of plantation affected, distribution
- Part of the tree affected
- Eucalypt species affected

Surveillance on *L. invasa* in Vietnam

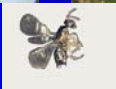
- **Forest health Network** was set up within Forest Science Institute of Vietnam (FSIV) and provincial organisations and the private sector.
- **Forest Protection Research Division (FPRD)** belonging to FSIV is centre of the Network and umbrella of FSIV and MARD.
- The **FPRD** gives training courses and receives information on *L. invasa* from the Network.

Surveillance on *L. invasa* in Vietnam



- Training course to the Network on **Protocols for collecting samples**

Surveillance on *L. invasa* in Vietnam



- Training course to the Network on **symptoms, identification and biology of *L. invasa***

Surveillance on *L. invasa* in Vietnam



- Training course to the Network on incidence (I), severity (D) and crown damage index (CDI).

Surveillance on *L. invasa* in Vietnam



- Training course to the Network on using GPS for mapping area affected

Surveillance on *L. invasa* in Vietnam



- Publishing and distributing to the Network on field guide to pests and pathogens including *L. invasa*

Surveillance on *L. invasa* in Vietnam



- Distributing and spreading to the Network on **Leaflet of *L. invasa***

Surveillance on *L. invasa* in Vietnam

FOREST HEALTH SURVEILLANCE FIELD FORM			
LOCATION	COORDINATE	ACTIVITY	DATE
NAME	ADDRESS	ORGANIZATION	INITIALS
HOST SPECIES 1 Rubber tree 2 Rubber tree 3 Rubber tree 4 Rubber tree 5 Rubber tree 6 Rubber tree 7 Rubber tree 8 Rubber tree 9 Rubber tree 10 Rubber tree 11 Rubber tree 12 Rubber tree 13 Rubber tree 14 Rubber tree 15 Rubber tree 16 Rubber tree 17 Rubber tree 18 Rubber tree 19 Rubber tree 20 Rubber tree	HOST STATUS 1 Healthy 2 Healthy 3 Healthy 4 Healthy 5 Healthy 6 Healthy 7 Healthy 8 Healthy 9 Healthy 10 Healthy 11 Healthy 12 Healthy 13 Healthy 14 Healthy 15 Healthy 16 Healthy 17 Healthy 18 Healthy 19 Healthy 20 Healthy	SYMPTOM 1 Yellowing 2 Yellowing 3 Yellowing 4 Yellowing 5 Yellowing 6 Yellowing 7 Yellowing 8 Yellowing 9 Yellowing 10 Yellowing 11 Yellowing 12 Yellowing 13 Yellowing 14 Yellowing 15 Yellowing 16 Yellowing 17 Yellowing 18 Yellowing 19 Yellowing 20 Yellowing	CONTROL METHOD 1 None 2 None 3 None 4 None 5 None 6 None 7 None 8 None 9 None 10 None 11 None 12 None 13 None 14 None 15 None 16 None 17 None 18 None 19 None 20 None

- Guide members of the Network on **fill in the survey form.**

Surveillance on *L. invasa* in Vietnam



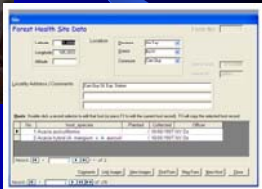
- Providing to individuals of the Network on **Certification of forest health surveillance**

Surveillance on *L. invasa* in Vietnam



- Receiving thousands of filled surveillance forms and *L. invasa* samples from the Network

Surveillance on *L. invasa* in Vietnam



- Working the filled surveillance forms and samples from the Network: **Identification and data base.**

Minimising impacts of *L. invasa* in Vietnam

- To be aware of the risk/danger/threats of *L. invasa* to eucalypts.
- Establishing genetic trials for screening susceptibility/resistance to *L. invasa* of clones/provenance/species in high risk areas.

Minimising impacts of *L. invasa* in Vietnam



- Trial of *E. camaldulensis* clones for screening resistance to *L. invasa* in a high risk area.

Minimising impacts of *L. invasa* in Vietnam



- *E. camaldulensis* plantation of *L. invasa* resistant clone

Minimising impacts of *L. invasa* in Vietnam



A trial including 23 provenances belonging to 18 eucalypt species was established in Vinh Phuc province (seed from the Australian Tree Seed Centre, Australia)

Minimising impacts of *L. invasa* in Vietnam

- 15 species represented by a single provenance, four species, *C. henryi*, *C. citriodora*, *C. tessellaris*, and *E. cloeziana* were resistant to *L. invasa*
- Another 9 species showed low damage severity: *E. pellita*, *E. microcorys*, *E. pilularis*, *E. robusta*, *E. coolabah*, *E. globulus*, *E. smithii*, *E. moluccana*, and *C. polycarpa*.
- Moderate damage was observed for one species, *E. saligna*.
- Severe damage was observed for *E. tereticornis*.

Thank you for your attention