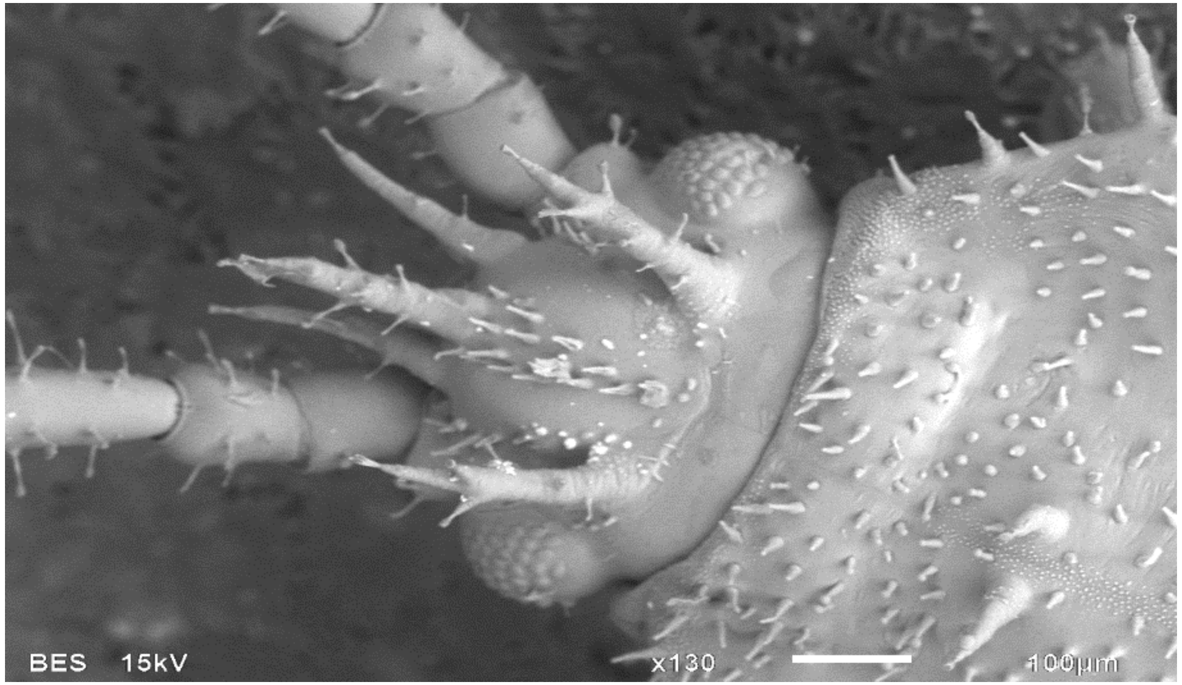


WAKE UP TO LACE BUG

Robert Spooner-Hart

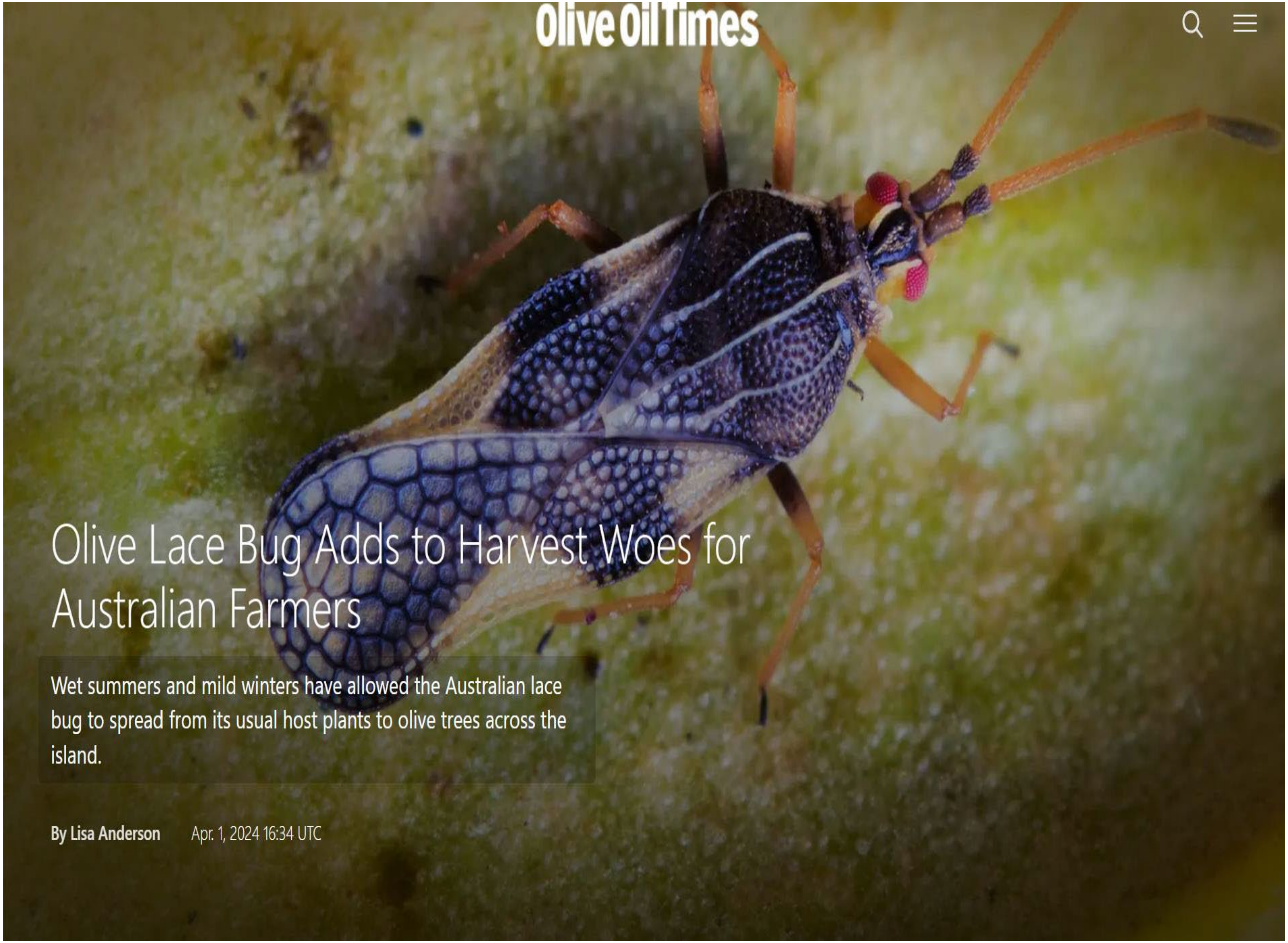
AOA Conference Bendigo October 2024

Hort Innovation
Strategic levy investment

AUSTRALIAN OLIVE ASSOCIATION LTD

WESTERN SYDNEY UNIVERSITY

Olive Oil Times



Olive Lace Bug Adds to Harvest Woes for Australian Farmers

Wet summers and mild winters have allowed the Australian lace bug to spread from its usual host plants to olive trees across the island.

By Lisa Anderson   Apr. 1, 2024 16:34 UTC

Watch

Native bug threatens to destroy olive industry

Share

Published 26 August 2024, 6:27 pm

SO WHY HAS LACE BUG BEEN SO BAD RECENTLY?

- Impacts of climate change on OLB, & other pests and diseases:

  * El Niño- heat, drought/bushfires, stressed trees

  * La Niña- cooler summers, rain, high humidity, nymph survival
  Warmer winters also may cause higher overwinter survival and earlier spring activity


Overwintering adults (also eggs)

- With La Niña, trees produce more foliage, changing in-tree microclimates and restricting penetration/coverage of pesticides

  * Spray timing may also be compromised by wet weather

- Monitoring may have been ineffective in detecting emergence of the first generation, especially in areas where lace bug may have not previously been a serious problem.

  * Major damage usually associated with second and subsequent generations (especially overlapping generations).

LIFE CYCLE OF OLIVE LACE BUG

Females oviposit eggs on underside of fully developed leaves, commonly near the midvein

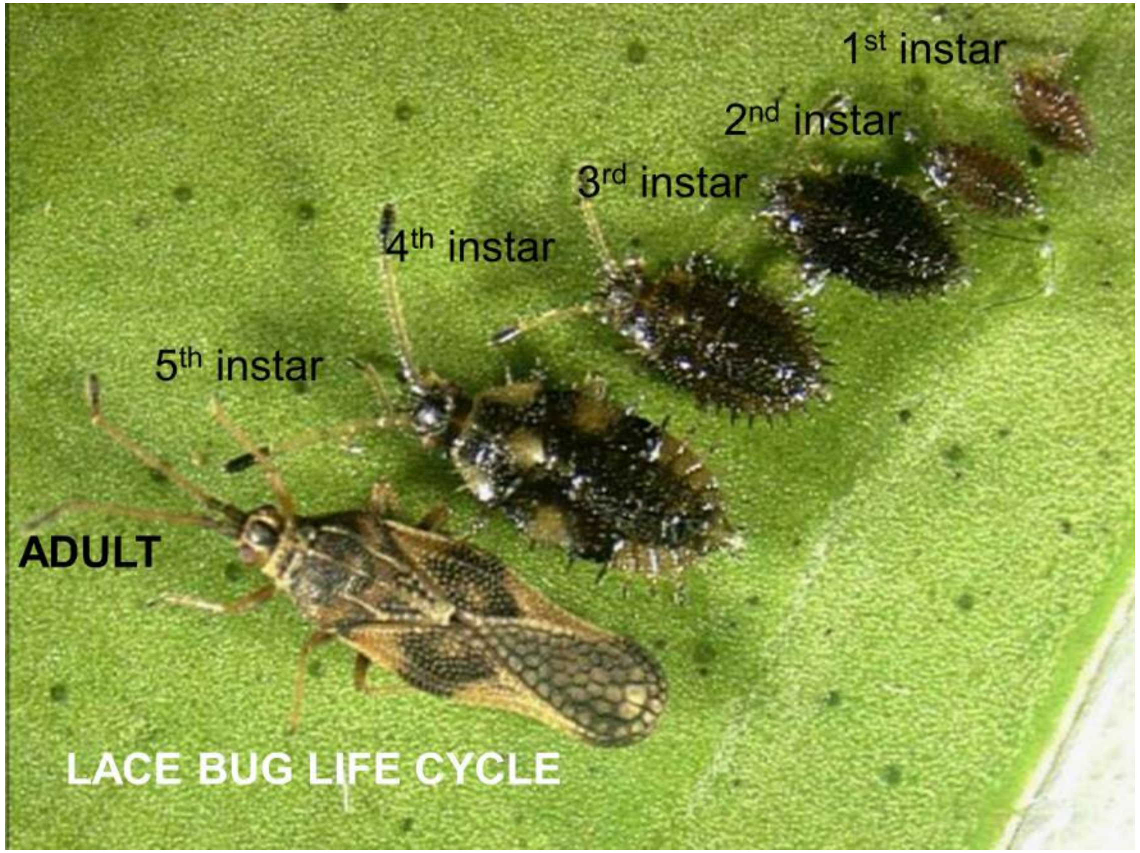
Eggs hatch usually in batches, with nymphs commonly emerging in clusters on undersides of leaves

There are 3 or more generations/yr, depending on climate

• 1st generation infestations occur in **late winter-**early-mid spring in the north and mid-late spring in the south (**NOTE sometimes earlier**)

• There are 5 nymphal instars

• Nymphs are highly spined and gregarious (clustered), usually on undersides of leaves

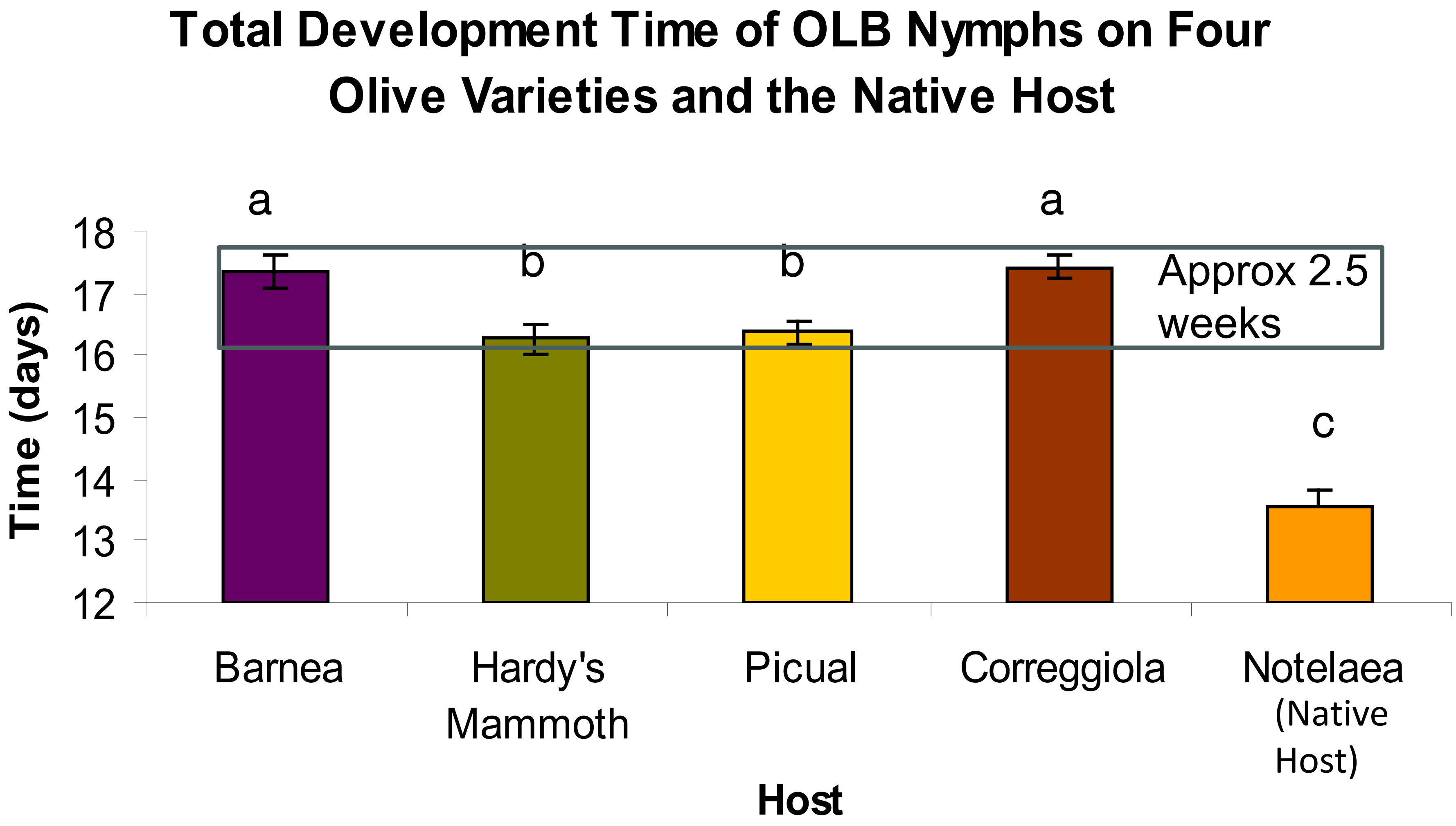



2nd
1st
4th
5th
This image shows mixed nymphal instars under magnification.
Instar stages are numbered, and 4th and 5th instars have wing buds

OLB NYMPHAL DEVELOPMENT AT 27°C

As the graph below shows, OLB develops at different rates on different olive varieties (the shorter the Time, the more rapidly they develop)

Columns headed with different letters are significantly different



DAMAGE

- All motile stages have piercing and sucking mouthparts
- They mostly feed on undersides of leaves, but adults are also found on upper leaf surfaces, including leaf tips on winter days
- Leaves initially show yellow spots; severe infestations cause general leaf yellowing, leaf drop, and sometimes even death in young trees

Severely damaged UC trees, SE Qld

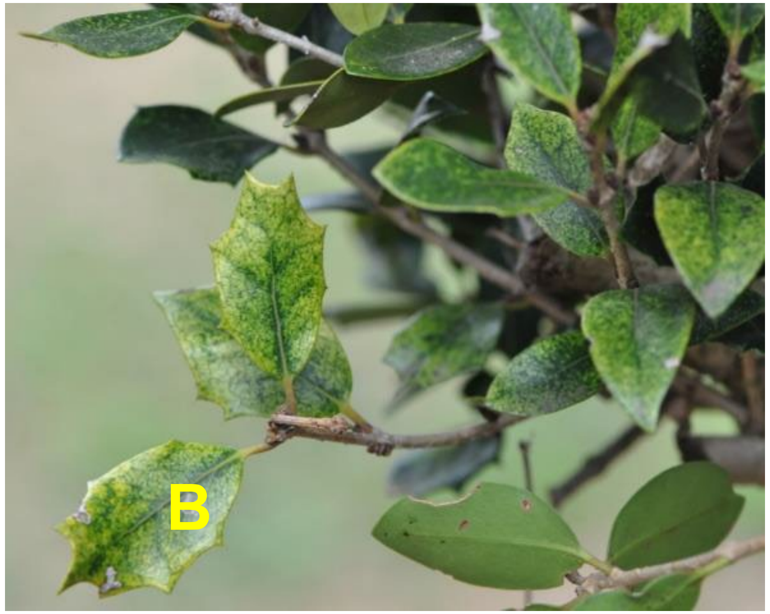
ABANDONED OLIVE GROVE DEVASTATED BY OLB

OLB HAS OTHER NON-OLIVE CROP HOSTS

All are in the family Oleaceae, e.g., native *Notelaea longifolia* in native forests- OLB's original host (A)

Introduced claret ash (*Fraxinus angustifolia*), green olive tree (*Phyllyrea latifolia*), and osmanthus (*Osmanthus fragrans*) (B)

ALTERNATIVE HOSTS (especially Ash) WERE IMPORTANT IN THE RECENT VICTORIAN OUTBREAKS in 2nd-3rd generations



MONITORING
(THE KEY TO LACE BUG MANAGEMENT)

- Groves (or blocks in large groves) should be monitored at least monthly during the growing season (**starting late winter**) **to detect emergence of first generation**

- Monitor priority blocks (those with history of problems, susceptible varieties/age of plants, or high quality produce) more frequently

- Divide large blocks into sub-blocks. Select several rows within each sub-block. Sample different rows/trees each time, and include more detailed tree inspection

- Examine individual trees from all sides and at all heights using a systematic approach

- **Recommended that regional growers collaborate in communicating local pest and disease detections**

- Inspect samples of leaves, twigs, flowers and fruit for the presence of pests, diseases or damage and their stage(s) of development using a 10× hand lens or magnifying glass, or handheld digital microscope.

- If a pest is detected, check surrounding trees in the row and adjacent rows to establish the extent of the infestation. This is useful for spot treatment.

- Technologies such as satellite imaging, drones and robots with image analysis can also gather plant health data.

- Monitoring after an intervention (such as pesticide application, or release of a biological control agent) will demonstrate its level of success.

RECORDING MONITORING DATA

Record monitoring data including date, and in case of detection of pest, disease or damage, note tree(s) ID cultivar and position, extent of damage, pattern of infection, life stage, any parasitism etc.

Make a note of the pattern of infection, which is the association of the disease or pest with

- Terrain (e.g. sheltered or exposed locations, low lying areas)
- Weather and aspect (prevailing wind direction, orientation to sun.
- Tree characteristics (cultivar, age, part of tree affected)
- Cultural practices (irrigation, fertilizers, pesticides, pruning, mulching)

This particularly helps in interpreting the monitoring data

NON-CHEMICAL OPTIONS FOR OLB

e.g. biological control (green lace wings, spiders, ants, entomopathogens), behavioural control?

Green lacewing larva

Green lacewing eggs

Adult green lacewing

- Green lacewings (*Mallada signata*) available commercially, have been used by several olive growers, with some reported success.
- Spiders play some (minimal?) role, mainly with adults
- Some foliar fertilisers (e.g. potassium carbonate) and oil sprays may also suppress OLB populations, but this has not been scientifically validated, nor are these products permitted for this use.

CHEMICALS REGISTERED OR LEGALLY PERMITTED FOR USE AGAINST OLIVE LACE BUG

(October 2024 APVMA website) Systemic/Translaminar * Information on timing questionable

ACTIVE CONSTITUENT	MoA GROUP	PRODUCT(S)	REGISTERED OR PERMIT	CONDITIONS OF USE
Clothianidin	4A (I)	SAMURAI®	PER14897 Until Jan 2026	1 application/season. Add MAXX surfactant. WHP 56 days.
Potassium soap		NATRASOAP®	PER14414 Until Jul 2028	Apply 2 treatments 7–10 days apart. Organically acceptable. No WHP.
Dimethoate	1B (I)	ROGOR®, various others	PER13999 Until Jul 2026	Max 4 applications/season. 2 sprays, 7–14 days apart. Not to be used for table olives. WHP 6 weeks.
Esfenvalerate	3A (I)	SUMI-ALPHA FLEX®, various others	Registered	Max 4 applications/season to fruiting trees, ≥ 14 days apart. WHP 14 days.
Pyrethrins	3A (I)	PYGANIC, and others	PER81870 Until Jul 2029	Max 6 applications/season, ≥ 14 day re-treatment interval. Use different MoA product after 2 applications. WHP 1 day.
Acetamiprid and Pyriproxyfen	4A (I) 7C (I)	Trivor®	PER 89943 Until Nov 2025	Max 2 applications/season, ≥ 14 day apart. WHP 28 days. *
Flupyradifurone	4D (I)	Sivanto Prime®	Registered	Max 2 applications/season ≥ 2 months apart WHP 14 days. *

TAKE HOME MESSAGES

- **MONITOR CROP REGULARLY FOR OLB AND OTHER PESTS AND DISEASES** (focus initially on areas with previous history; also consider regional communication)

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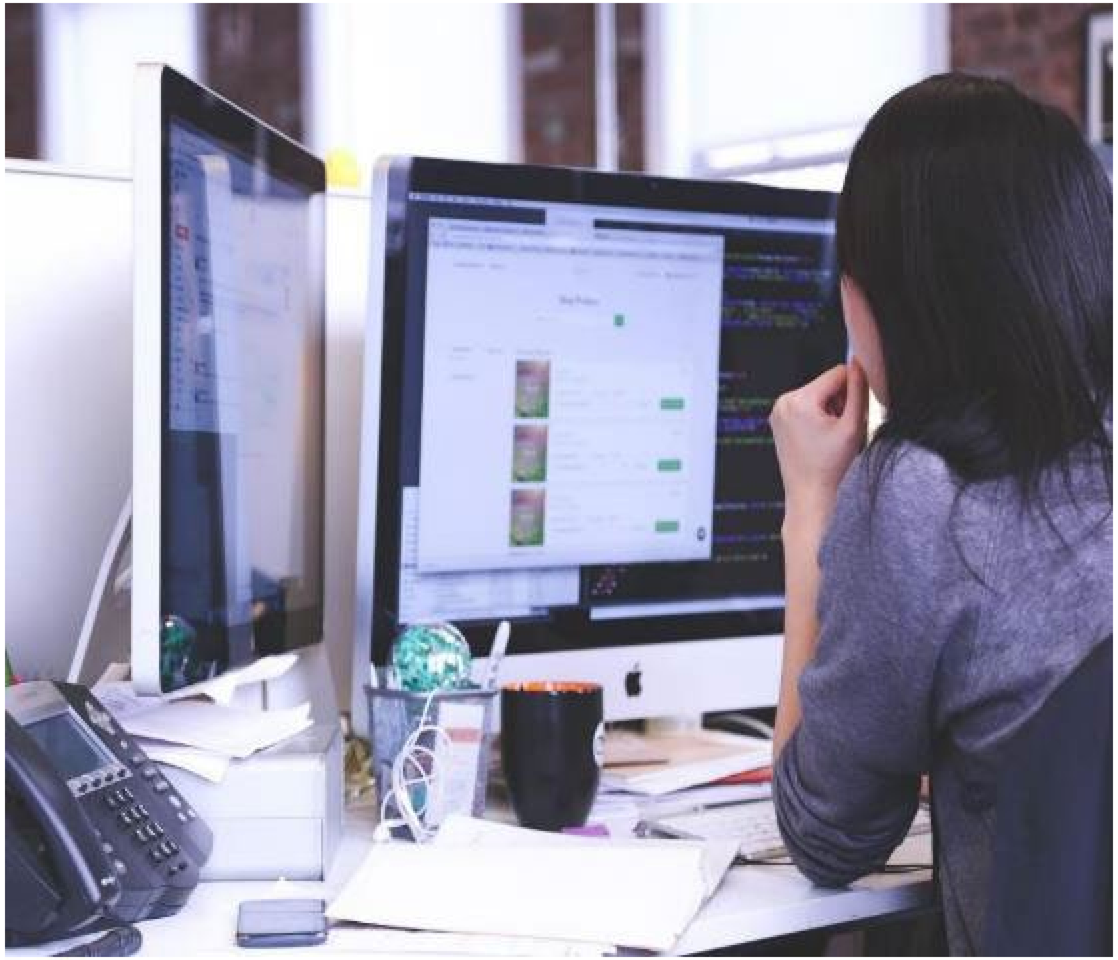
- **MONITOR FOR SUCCESS OF YOUR APPLIED STRATEGIES**, and adjust/modify them accordingly

WEB-BASED INFORMATION ON PESTS & DISEASES

Produced as part of a Western Sydney University/ AOA/Hort Innovation

They are available 24/7 on the AOA's open-access website, OliveBiz



Hort Innovation
Strategic levy investment

AUSTRALIAN OLIVE ASSOCIATION

WESTERN SYDNEY UNIVERSITY

WE ARE NOT ALONE

OLIVE LACE BUGS WORLDWIDE

Ethiopia 1960s severe damage recorded; may be *Plerochila australis* or *Teleonemia scrupulosa*

NORTHERN INDIA

Indian Journal of Entomology Online published Ref. No. e23228 DoI. No.: 10.55446/IJE.2023.730

EMERGING PEST PROBLEMS IN EXOTIC OLIVE AND GROWER SPECIFIC IPM MODULES FOR JAMMU AND KASHMIR

GUPTA R K*[1], BALI K[1], MOHD MONOBRULLAH[2] AND SHAFIYA RASHID[1]

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ABSTRACT

About 34 insect species were found infesting olive orchards in UT of J&K Among them, olive psylla, *Euphyllura pakistanica*; olive black scale, *Saissetia olea* and tinged bug, *Eteoneus* sp. *sigilatus* Drake caused serious damage. The avoidable yield losses caused by all the pest species were 33 to 53%. On the basis of various field trials conducted neem insecticidal soap (NIS @ 2.5 %) and horticultural mineral oil (HP spray oil 2% of solution) were found effective against major pests. In case of severe infestation imidacloprid (17.8 SL) *a.i.* 0.075 % and cartap hydrochloride 4G @ 100g/ tree resulted in their efficient suppression. As such these treatments were incorporated in grower specific IPM modules evaluated for two years. Amongst the tested modules, integrated module (M1) followed by pesticide module (M3) were found most effective. However, for resource poor farmers and non-disruptive cultural module M_1 and organic growers M_2 could be alternatively practiced. It was concluded that for scale and psyllids, the insecticide protection is necessary but the infestation by lace bug could be managed by non-disruptive methods.

Key words: Olive scales, lace bug, olive psylla, natural enemies, infestation, yield losses, cultural control, non-disruptive practices, organic protection, IPM modules, resource poor farmers, neem, mineral oil, imidacloprid, cartap hydrochloride

SOUTH AFRICA

insects

MDPI

Article

Species Diversity and Phylogenetic Relationships of Olive Lace Bugs (Hemiptera: Tingidae) Found in South Africa

Vaylen Hlaka [1], Éric Guilbert [2], Samuel Jacobus Smit [3], Simon van Noort [4,5], Elleunorah Allsopp [6], Jethro Langley [1] and Barbara van Asch [1,*]

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[6] Agricultural Research Council, Infruitec-Nietvoorbij, Private Bag X5026, Stellenbosch 7599, South Africa; AllsoppE@arc.agric.za
* Correspondence: bva@sun.ac.za

check for updates

Citation: Hlaka, V.; Guilbert, É.; Smit, S.J.; van Noort, S.; Allsopp, E.; Langley, J.; van Asch, B. Species Diversity and Phylogenetic Relationships of Olive Lace Bugs (Hemiptera: Tingidae) Found in South Africa. *Insects* **2021**, *12*, 830. https://doi.org/10.3390/insects12090830

Academic Editor: Nickolas G. Kavallieratos

Simple Summary: Olive lace bugs feed on wild and cultivated *Olea europaea*, causing a negative impact on plant vitality and development. These insects are known to affect olive orchards in South Africa, the country where most of the olive and olive products on the continent are produced. However, the diversity of species of these pests is not clear. Morphological analysis and DNA barcoding showed the presence of *Cysteochila lineata, Plerochila australis, Neoplerochila paliatseasi* and *Neoplerochila* sp. Further analyses of genetic divergence and phylogenetic clustering in 30 species in 18 genera of Tingidae using new and publicly available DNA barcodes showed that the majority of sequences deposited on BOLD Systems were correctly assigned to species. The complete mitochondrial genomes of the four species found in South Africa were sequenced to assess their phylogenetic position within Tingidae. The four olive lace bugs formed one cluster of species, and the genus *Cysteochila* was not monophyletic as *C. lineata* grouped with the other three olive lace bugs but *C. chiniana* was placed in a different cluster. This result suggests that lace bug species that feed on olive trees may have a common ancestor and calls for further research on potential adaptations to *O. europaea*.

Figure 1. Representative adult specimens of olive lace bug (Hemiptera: Tingidae) species found in South Africa. (**A**) *Cysteochila lineata* Duarte Rodrigues (SAM-HEM-A01275), (**B**) *Neoplerochila paliatseasi* Duarte Rodrigues (SAM-HEM-A011647), (**C**) *Neoplerochila* sp. (SAM-HEM-A012753), and (**D**) *Plerochila australis* (Distant) (SAM-HEM-A010383).

OLIVE LACE BUG DAMAGE STELLENBOSCH South Africa
Images courtesy Dr Gulu Bekker, Stellenbosch University

DAVIS, CA

INTERNATIONAL OLIVE SUSTAINABILITY CONFERENCE

SEPTEMBER 5-7 2024

200 attendees from 16 different countries

CONFERENCE SESSIONS

1.1. BIODIVERSITY & PRODUCTION SYSTEMS
(including soil health, ecosystem services, vertebrates etc)

1.2. MANAGING INPUTS & CONSERVING RESOURCES (especially water and irrigation management, macronutrients)

1.3. TECHNOLOGY AND A SUSTAINABLE FUTURE (alternative energy solutions in field and mills, climate risk)

2.1 OLIVE ORCHARDS AND A CHANGING CLIMATE (carbon balance, historic climate change and olive trees)

2.2 REGULATION AND CERTIFICATION IN SUSTAINABILITY (certification and regulations, greenwashing? Developing sustainability programs)

2.3 CIRCULAR ECONOMY- UTILISING MILL AND FARM BY-PRODUCTS TO ADD VALUE (products, by-products, lost and waste, pomace biorefinery and use as soil ameliorant, sustainable olive oil packaging,

2.4 BUILDING COMMUNITY AND SUSTAINING HEALTH Social dimensions of olive oil value chain, EVOO and Mediterranean diet impacts on health and sustainability

3.1 SUSTAINABILITY IN THE MARKET : ADDING VALUE
Case studies in developing/implementing sustainability plans, including Cobram Estate, heritage tree preservation

3.2 OLIVE OIL AND THE PLANT FORWARD KITCHEN: SUSTAINABLE EATING/HEALTHY EATING/DECICIOUS EATING Culinary Institute of America

WHOLE DAY OLIVE FIELD TOUR

RECOMMENDATIONS

Australia is already performing well in many areas of olive work on the world stage. We should work more with international colleagues, as partners.

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The AOA should increasingly link with key international partners that are supportive of working with Australia on sustainability and other key industry issues (via projects/ conferences/visits/study tours), such as:

UC Davis
University of Jaen, Spain
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As an industry, we should increasingly develop, record and document our sustainability credentials

The ghost of lace bugs past ?

The ghost of lace bugs past ?

Rather than a glimpse into the future


Any
questions?