

# *Evaluation of key chemicals for pest management in the olive industry*

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**MORE THAN 30 OLIVE PESTS  
AND DISEASES RECORDED IN  
PEST & DISEASE FIELD GUIDE,**

**BUT**

**ONLY LESS THAN 10 MAJOR  
ONES**

# **BACKGROUND TO PROJECT**

- **AROSE FROM SARP PROJECT**

AOA/RIRDC SARP R&D meeting, Melbourne  
October 2008

**Identification of key pests/diseases without  
adequate legal chemical management options**

## **KEY PESTS/DISEASES IDENTIFIED**

- **Olive lace bug**
- **Fruit rots, including anthracnose**

# **FACTORS FOR SELECTION OF CHEMICALS**

- **New chemistry rather than old chemistry**
- **Safety for environment and humans (growers/ consumers)**
- **Compatible with IPDM and “healthy” image of olive products**
- **Efficacy**
- **No major residue problems in olives or oil**
- **Relative ease to obtaining permits/registration from APVMA**
- **Preparedness of manufacturer/distributor to support its use in olives**

**PROJECT HAS JUST COMMENCED**

**WILL RUN UNTIL END 2012**

**AIMS:**

- **Select suitable chemicals for field evaluation**
- **Develop evaluation protocols to provide suitable data for permits/registration by APVA**
- **Generate field data on efficacy, residues in fruit/oil (with manufacturers)**
- **Provide olive industry with understanding of protocols and procedures for field evaluation of agrichemicals**
- **Collaboration between UWS and AgAware P/L**

# **OLIVE LACE BUG, *Froggattia olivinia* (Hemiptera: Tingidae)**

- **Native Australian species**
- **Original host *Notelaea longifolia* (native olive)**
- **Normally 3 generations/year**
- **Recorded in NSW, Qld, Vic, SA, WA (2002 and 2006)**



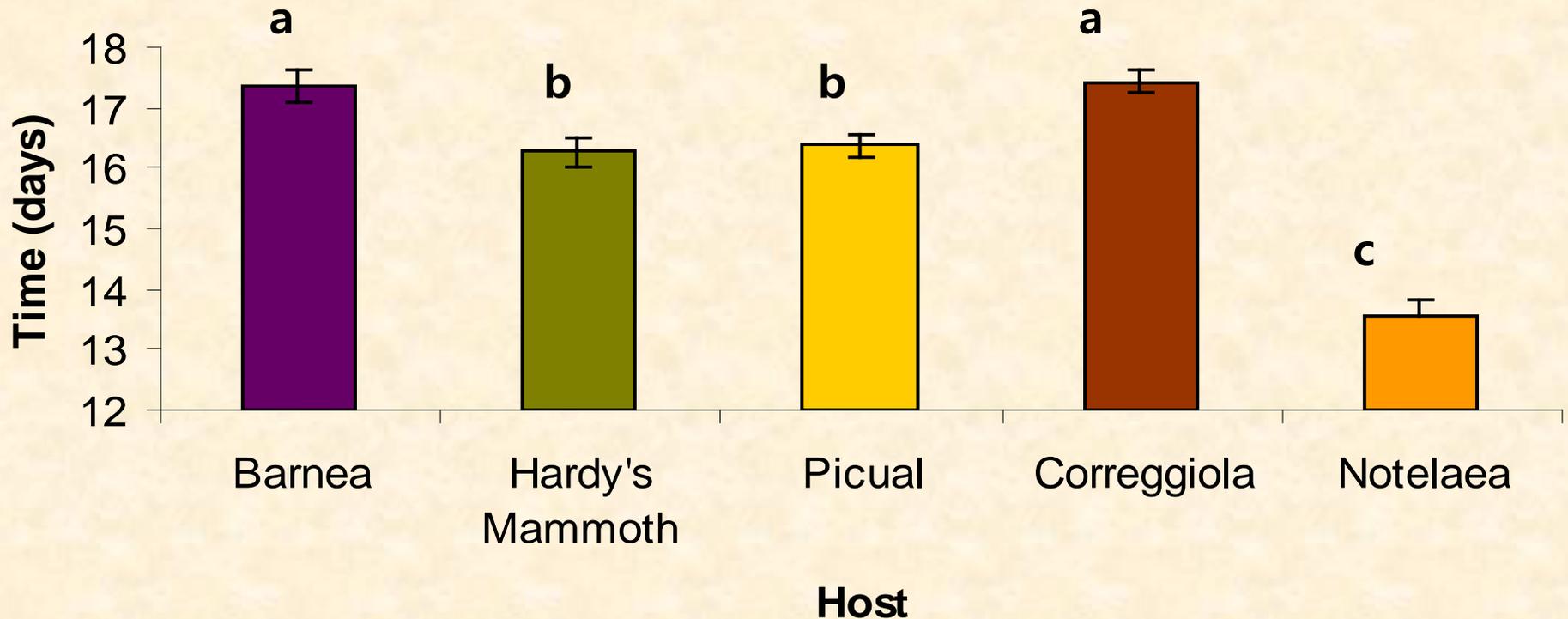
# OLIVE LACE BUG LIFE CYCLE





# OLB nymphal development at 26°C

**Total Development Time of OLB Nymphs on Four Olive Varieties and the Native Host**



# Olive lace bug damage



# Field damage by OLB Leaf drop, tree death

Late autumn adults for ready overwintering



Severely damaged Correggiola,  
Manzanillo behind

- All motile stages have piercing and sucking mouthparts
- Nymphal stages are clustered on undersides of leaves
- Adults less clustered, fly short distances



# CURRENT PESTICIDES ABLE TO BE USED AGAINST OLIVE LACE BUG

<b>PRODUCT</b>	<b>PERMIT</b>	<b>CONDITIONS OF USE</b>
<b>Fenthion</b>	<b>PER10455</b>	<b>Olive nursery stock- Quarantine treatment WA</b>
<b>Fenthion</b>	<b>Old permit PER8560</b>	<b>Permit pending. Also green vegetable bug, Rutherglen bug, fruit flies</b>
<b>Natrasoap</b>	<b>PER11152</b>	<b>Until Sept. 2013</b>
<b>Dimethoate</b>	<b>Old permit PER8559</b>	<b>Permit pending. Also green vegetable bug, Rutherglen bug</b>

# **LIKELY CANDIDATES FOR EVALUATION AGAINST OLB**

- **Thiamethoxam, Actara (Syngenta)**  
**Applied as foliar application 1-2 times 7-14 days apart**
- **Clothianidin, Samurai (Sumitomo).**  
**Applied as a root drench**
- **Acetamiprid, Intruder (Du Pont).**  
**Applied as foliar application 1-2 times/season?**
- **Industry standard Fenthion (based on European information, not the best choice)**

# FRUIT ROTS

## 1. ANTHRACNOSE

- Fungi *Colletotrichum acutatum*, *C. gloeosporoides*
- Both species may be found in the one grove
- Latent infection, can infect young fruit and even flowers
- Spores produced and germinate during warm, moist weather
- Current control is copper, but is only preventative, and may require numerous applications

# Different symptoms caused by anthracnose



*C. acutatum*



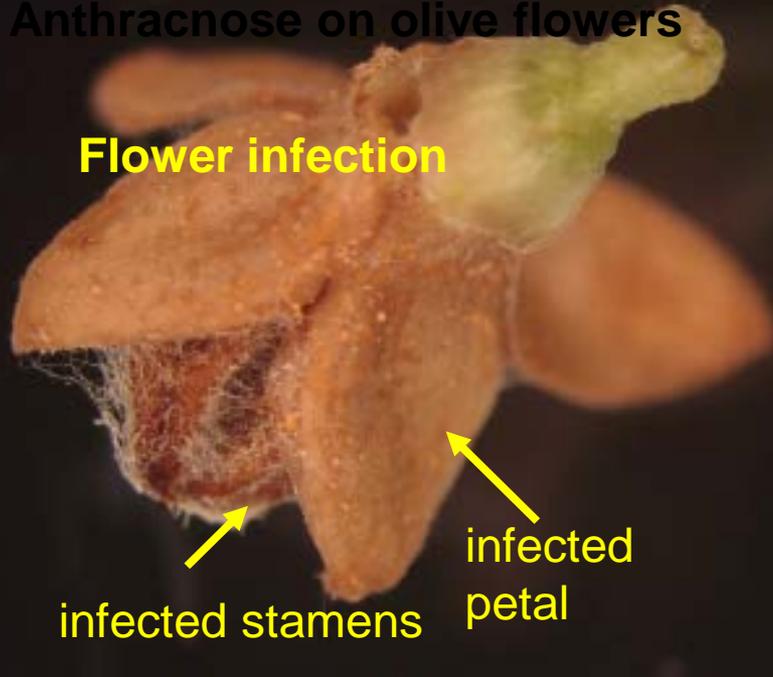
*C. gloeosporioides*



Images Vera Sergeeva

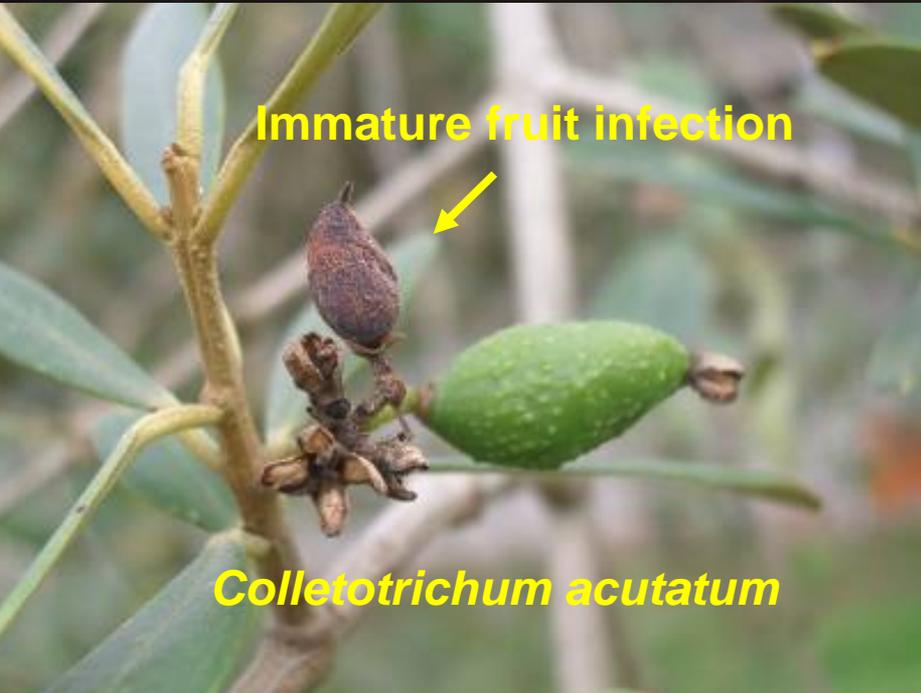
**Anthracnose on olive flowers**

**Flower infection**



# Flower and young fruit infection

**Immature fruit infection**



***Colletotrichum acutatum***

Images Vera Sergeeva

# Fruit rot caused by *Pseudocercospora cladosporioides*

- Most commonly a leaf-infecting pathogen
- In severe infestations, can infect fruit
- Incidence appears to be spreading/increasing



Upper and lower leaf surface symptoms



Images Vera  
Sergeeva

# Fruit rot caused by *Pseudocercospora cladosporioides*

## Cercosporiosis on olive immature fruits



Images Vera Sergeeva

# Cercosporiosis on mature olive fruits



Images Vera  
Sergeeva

# **CURRENT PRODUCTS ABLE TO BE USED AGAINST FRUIT ROTS**

<b>PRODUCT</b>	<b>PERMIT</b>	<b>CONDITIONS OF USE</b>
<b>Copper oxychloride</b>	<b>Registered (various products)</b>	<b>Also peacock spot, cercosporiosis</b>
<b>Copper hydroxide</b>	<b>PER11360</b>	<b>Until Dec 2013 Also peacock spot, cercosporiosis</b>

# **LIKELY CANDIDATES FOR EVALUATION AGAINST FRUIT ROTS**

- **Tri-base Blue (Tribasic copper sulphate)  
(NuFarm).**  
**Lower copper load. Preventative  
(protectant)**
- **Cabrio Top (Pyraclostrobin + mancozeb)  
(NuFarm)**  
**Systemic, curative and protectant.**
- **Industry standard- copper oxychloride**

# **CALL FOR GROWER PARTICIPANTS**

**We are still seeking groves for field trials associated with the project**

## **Requirements**

- Regular historical incidence of olive lace bug and/or olive fruit rots (particularly anthracnose)
- Commercial, bearing grove
- Member of AOA
- Manager or trained support to assist in application of pesticides etc
- Willingness not to harvest from the trial trees (normally 4-5 replicates of 1-3 trees per treatment, up to 5 treats)

## **OTHER RECENT PEST AND DISEASE RESEARCH**

- Participated in 4th European Meeting of the IOBC Working Group Integrated Protection of Olive Crops Cordoba Spain, 1-4 June 2009 and inspected University of Cordoba IPDM research as part of RIRDC/UWS sponsored Conference travel.**
- Recently revisited Spain/Italy as part of UWS study leave to observe and discuss olive fly damage and management.**

## Number of papers (oral and poster) presented on specific topics

PEST/DISEASE/ISSUE	SCIENTIFIC NAME	NUMBER OF PAPERS (ORAL & POSTER)
Olive fruit fly	<i>Bactrocera oleae</i>	37
Verticillium wilt (mainly defoliating strain)	<i>Verticillium dahliae</i>	11
Beneficial organisms in olive groves	various	8
Olive moth	<i>Prays oleae</i>	2
Black scale	<i>Saisettia oleae</i>	2
Anthracnose	<i>Colletotrichum gloeosporoides</i> , <i>C. acutatum</i>	2
Olive viruses	various	2
Leopard moth	<i>Zeuzera pyrina</i>	1
Eriophyid mites	Various, in family Eriophyidae	1
Nematodes	various	1
Peacock spot	<i>Fusicladium oleagineum</i>	1
Olive knot	<i>Pseudomonas savastanoi</i> pv. <i>savastanoi</i>	1

# **KEY FINDINGS FROM WORKSHOP**

## **Key pests and diseases issues in Mediterranean olives**

- olive fly (throughout Mediterranean)**
- defoliating strain of verticillium wilt (Andalucia, spreading)**
- olive moth (much of Mediterranean)**
- beneficial species and their roles in olive groves considered important**

# *Olive fly* *Bactrocera oleae* Gmelin

- Fruit losses 5-15% in treated groves, (up to 80% in untreated groves)
- Populations can differ with location and season
- Monitoring essential
- Insecticide cover sprays common





# ***Olive fly Bactrocera oleae***

- Baits with attractants
- Mass trapping being investigated
- Sterile insect technique being investigated
- Biological control used, but not very effective
- Some resistance/tolerance in some olive varieties





**McPhail trap for  
female olive fly**



**Currently evaluating at UWS new Spanish-developed attractant (Ceratrapp/Dacus trap) for mass trapping of Olive Fly and Mediterranean Fruit Fly against Queensland Fruit Fly**



# ***Defoliating strain of Verticillium Wilt (V. dahliae)***

- **Biggest new threat to olive industry in Mediterranean**
- **Only in Andalusia, Spain but spreading**
- **Initially, commonly associated with cotton, but more widespread**
- **Transmitted by infected nursery stock, vehicle movement, infected leaves**

- **Transmitted also by irrigation water (rivers, aquifers)**
- **No effective control at present**
- **Evaluation of biological control using antagonistic microorganisms**
- **Higher tolerance occurs in some cultivars, development of breeding program**



Trial at University of Cordoba on cultivar tolerance of defoliating strain of Verticillium Wilt

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