



# Olive growing



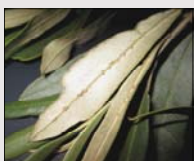
## About our company

Brief capability statement and company history.



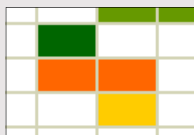
## Olive growing services

Pest and disease control, soil and tissue testing, water resources development and maintenance, pruning, weed control, mid row management and harvesting.



## Fact sheet

Integrated pest management control of scale in olive groves by Tim Bartsch, B Ag Sc (Vit Sc) (Hons), Infield Ag.



## Annual programs

Informative tables showing warm and cool climate programs.



## Biodiversity

Alternative management of insect pests.



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## About our company

From humble beginnings as a rural contracting firm, Infield evolved into a fully fledged vineyard contracting company known as Adelaide Hills Vineyard Contractors Pty Ltd during the 90s.

During this period, Infield developed and managed numerous projects in a range of locations including Victoria, New South Wales and the South East. These varied in size from specialist boutique vineyards, to major developments for large corporations. The produce from these ventures currently finds its way to several well-known wine brands throughout South Australia.

In keeping with demand, our company now offers consultancy and contractor services across a broader agricultural spectrum, and includes a loyal core of olive growers as part of its regular clientele.

Infield aims to provide all the services required to produce premium products in the most cost effective manner. We can achieve this by way of our commitment to customer satisfaction by providing:

> Personalised service

- > A high standard of communication
- > Qualified staff
- > A network a key industry contacts and professional associates
- > Continually revising our work practices to ensure we meet the highest industry standards
- > Competitive rates
- > A comprehensive fleet of machines and equipment
- > A safe, satisfying work environment for our personnel
- > Developing new technology

We believe that our experience will readily adapt to any rural venture and will continue to expand into the field of olive growing.



### Our services

Consultancy	Property assessment, budgeting and cash flow, assistance with planning applications
Technical	Disease monitoring, soil and tissue assessment, weather station and monitoring equipment sales and service
Development	Development work as may be required
Management	Infrastructure maintenance, crop management and recommendations



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## Olive growing

Infield provides a range of services to olive growers in our region including:

### Pest and disease control

This service involves regular inspections of your trees to identify and monitor the spread of the various insect pests and diseases to which olives are prone.

Infield can design and implement appropriate pest and disease prevention programs specific to your olive grove that will result in increased yield and improvements to plant health.

### Soil and tissue testing

Monitoring plant health parameters via soil and tissue testing are essential components of any horticultural production system.

Infield can provide collection and analytical services that will ensure that the correct soil and nutritional inputs are applied to your grove.

Fertiliser, lime and gypsum spreading are part of this service.

### Water resources

Infield can assist with water management in a number of ways:

- > Assessment of water requirements
- > Water quality testing
- > Irrigation system installation
- > Dam construction and refurbishment
- > Irrigation system maintenance and troubleshooting
- > Repairs to infrastructure
- > Supply of soil moisture and weather monitoring equipment

### Pruning

Infield will undertake your pruning requirements to maintain plant health and structure to ensure ease of removing fruit at harvesting.

### Weed control

Essential to good site management Infield will use the most appropriate control, taking into account the time of year, weed variety and sound environmental practices.

### Mid row management

Well maintained mid rows ensure maximum efficiency of all machinery passes.

Infield offers a range of mid row management services that can be tailored to your site. These include slashing, weed spraying, soil aeration and cover cropping.

### Harvesting

Infield has access to reliable teams of seasonal staff to hand pick your fruit, and will arrange transport and cold storage as required.

### FACT SHEET:

*Integrated pest management control of scale in olive groves.*

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Mike Page  
Mt Barker Springs SA



# Fact Sheet: Integrated pest management control of scale in olive groves

Tim Bartsch  
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Infield Ag.

TBOG 2009/1

The use of integrated pest management (IPM) has long been recognized as the only sustainable way to manage pests, as it often results in a significant reduction of pesticide use in the agricultural environment (Wearing 1988). This reduction in pesticide use has a positive effect on both the environmental and social sections of an agricultural industry. IPM also has the ability to greatly improve the economic returns to the farmer. For example growers who produce 80% of Queensland's citrus, have achieved a 90% reduction in chemical use where IPM has been fully implemented, which is equivalent to an average annual saving of \$2 million over 2 000ha of trees (Hardman *et al.* 1993).

IPM, as the name suggests is the integration of all forms of pest management to achieve the best outcome environmentally, socially and economically. This review will focus on the biological control of scale in olive groves, which is part of IPM strategy, but not necessarily the only form of control needed in a complete IPM strategy.

Scale in the olive industry is a major problem costing large amounts in both product loss and damage, as well as control measures. Biological control has been used very successfully in the past to control olive scale. In the mid fifties many Californian olive groves had scale densities of over 200 per twig, which were reduced to one or two per 50 twigs in the mid sixties by two introduced parasitoids (Murdoch *et al.* 1984).

In 2005 a survey of black scale parasitoids was conducted in 23 olive groves across five south Australian regions, being the South East, Riverland, Adelaide Hills / Mypolonga, NAP / Barossa and the Fleurieu Peninsula districts. Eleven different species were identified in this survey and a small number of insects remained unidentified. The five most common parasitoid wasp species found were *Euryischomyia flavithorax*, *Metaphycus lounsburyi* (*syn.*) *Metaphycus anneckeii*, *Scutellista caerulea* and *Diversinervus elegans*. A total of 683 parasitoids were reared in this study (Baker & Hardy 2005).

Research into the feeding habits and lifecycles of these parasitoids has been limited due to the amount of funding required to investigate the large number of parasitoids, hosts and crops. Rather than attempt to study all interactions, limited parasitoid/host/ crop interactions have been studied in greater depth to model the relationships. The use of buckwheat, phacelia and white Alyssum as a high value nectar source for the improved bio control of light brown apple moth by *Dolichogenidea tasmanica* has been studied as a model of enhanced bio-control using a high value nectar source (Bernard 2009).

These flowers have been chosen as their nectar has a particular 'sugar signature' (sugar content and proportion) which is beneficial to adult parasitic wasps. New Zealand studies have shown that *D. tasmanica* has a significantly increased lifespan, egg load and LBAM parasitism when fed with buckwheat or phacelia nectar when compared to the control (Bernard & Wratten 2007). >>>>

It is likely that the nectar from these flowers will have an effect on scale parasitoids similar to those seen on *D. tasamica*, however as previously mentioned, funding has not allowed study on the particular parasitoids to occur (Bernard 2009).

Alternate mowing of mid rows will also provide shelter and food sources for beneficial insects within the grove. Control of ants killing parasitoids and lacewings attempting to feed on the scale, may also be required or may further enhanced the bio-control of scale (Bernard 2009). It should also be noted that as bio-control is part of an IPM program, and the protection of parasitoids by the prevention of chemical use or the use of soft chemicals is crucial.

## References

Baker G. & Hardy J. 2005, SURVEY Black Scale Parasitoids in South Australian Olive Groves, Entomology Unit SARDI, Waite Campus

Bernard M. 2009, Personal Communication, University of Melbourne

Bernard M. & Wratten S. D. 2007, AgNote: Enhancing beneficial insects and mites in vinyards: providing nectar, pollen and shelter in vine rows, The Australian & New Zealand Grapegrower & Winemaker, April 2007 pp. 33-35

Hardman J. R., Papacek D. & Smith D. 1993, The use of Intergrated Pest Management in citrus orchards in Queensland- An economic perspective. In 37<sup>th</sup> Annual Conference of the Australian Economics Society, 9-11 Feb. 1993. University of Sydney

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Wearing C. H. 1988, Evaluating the IPM implementation process. Annual Review of Entomology, 1988. 33: pp.17-38





PLATE 1  
Black scale on olive leaves,  
Adelaide Hills SA



PLATE 2  
Sooty mould on olive leaves; adult  
scale, Adelaide Hills SA



PLATE 3  
Olive leaves showing weevil  
damage, Adelaide Hills SA

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WARM CLIMATE	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Reduce Irrigation												
Stop Irrigation												
Start Irrigation												
Harvest												
Pruning												
Apply lime & gypsum												
Herbicide spray												
Fungal spray												
Foliage fertiliser												
Tissue test												
Soil test												
Fertigation												
Eco seeding												
Insecticide/Oil spray												
Slash mid rows												
Cover cropping												

To be used as a guide only

Table 1  
Olive growing  
Warm climate program

### Fertiliser

1. Over application of fertiliser to promote quick growth can result in trees bearing fruit bi-annually.
2. Excessive fertiliser can enhance physiological symptoms such as “soft nose rot”
3. Boron can be detrimental if used in excess
4. Fertiliser programs can only be accurately determined by tissue testing. Each site will vary depending on soil type and pH. Varieties will also have different requirements.
5. Application rates may need to be increased if fertilizer is being applied through fertigation.

### Managing water resources

Irrigation management is fundamental to obtaining good growth rates. However, water over wider areas to ensure root zones strengths aren't compromised thereby reducing the stability of the trees. This practice also will ensure that trees have a better ability to survive change such as extreme weather events.

Good irrigation design is important, especially if you plan to run a fertigation system. Adjusting irrigation rates to suit fertiliser applications and inherent problems, such as salinity, are just as important as the rates of fertiliser applied. Different soils also have different irrigation requirements.

### Pest and disease control

Timing of treatment is important for the control of olive scale. There are various stages throughout their lifecycle which are ideal for treatment, for example crawlers are easiest to control at the point they emerge from the adult female. However, these periods represent only a very narrow window of opportunity, so effective control requires monitoring and identifying the stage of development.

COOL CLIMATE	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Reduce Irrigation	■	■										
Stop Irrigation			■									
Start Irrigation									■	■	■	■
Harvest			■	■								
Pruning				■	■							
Apply lime & gypsum			■	■								
Herbicide spray				■			■			■		
Fungal spray				■	■							
Foliage fertiliser					■	■						
Tissue test							■			■		
Soil test			■									
Fertigation									■	■		
Eco seeding							■					
Insecticide/Oil spray					■		■		■		■	
Slash mid rows								■		■		
Cover cropping			■	■								

To be used as a guide only

Table 2  
Olive growing  
Cool climate program



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## Biodiversity for sustainability and profit

Growing flowering plants around your olive grove will augment the life span of beneficial insects such as ladybirds and parasitic wasps, especially helpful in the control of black scale.

2007 saw Infield trial buckwheat at various locations in the Adelaide Hills as part of an on-going biodiversity project. In collaboration with the Lincoln University (NZ) and Melbourne University, Infield is now recognised as the primary “pathway to adoption” partner for its on-going biodiversity program.

Our research and practical trials have demonstrated that buckwheat is a key step to increasing biodiversity and thereby, the natural control of insect pests.

Infield has also developed its own direct sowing system and equipment suitable for use in a variety of Australian conditions.



Mid row sowing of buckwheat to promote biodiversity in the Adelaide Hills SA

### Benefits and cost savings

Creates favourable environment for beneficial insects

Potential reduction in the use of insecticides

Long term investment in the biodiversity of your property



Infield's “Eco-seeder”