

ALMONDS



> **Think**
Innovation

> **Trust**
Quality

> **Expect**
Performance



S A C O A

Overview

All orchardists are familiar with the use of spray oils in the dormant or delayed dormant period for the control of insect and mite pests. Since the turn of the century, growers have used oil sprays to control insects over-wintering in fruit trees.

The old oil sprays contained impurities, which turned the leaves brown if sprayed on green foliage. Thus, the sprays were mainly used only in the dormant season.

A true “dormant spray” should be applied before bud break - before growth starts. A “delayed-dormant spray” is applied after bud break and up to flowering.

The timing of oil spray applications is dependent upon the stage of development of the almond tree, and the life cycle of the targeted insect pest.

Timing of oil application can influence the degree of control of some pests, particularly as most pests have an immature stage which is more susceptible to the physical mode of action of an oil spray.

Failure to apply either a dormant or delayed-dormant oil may require that additional in-season treatments be applied. These are not only more costly, but are more disruptive to beneficial arthropods that keep secondary pests under control.

How do oil sprays work?

Oil sprays effectively manage certain insect pests in three ways:

1. BEHAVIOUR MODIFICATION

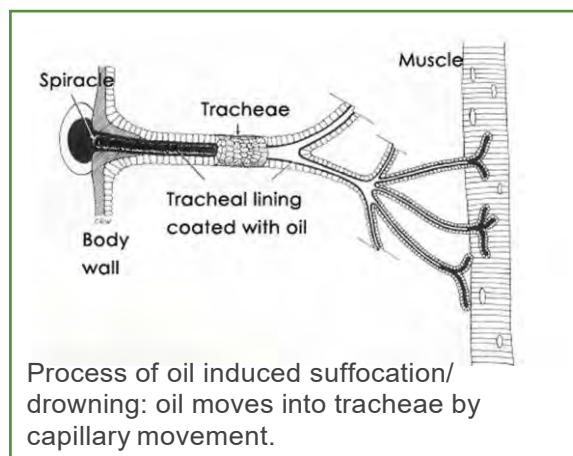
Deters the feeding and egg laying of pest insects.

2. SUFFOCATION / DROWNING

Blocks the air holes (spiracles) and lines the breathing tubes (tracheae) through which insects and mites breathe.

3. POISON

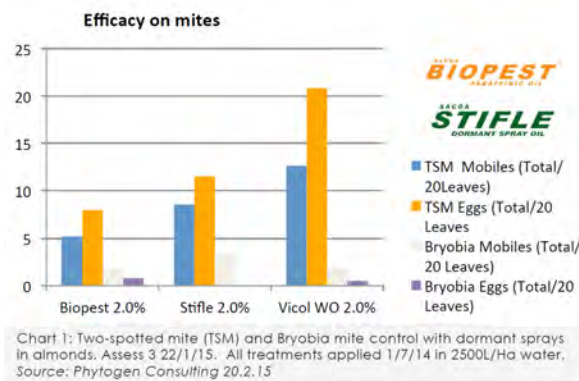
In some cases, spray oils may also act as a ‘poison’, interacting with the fatty acids of the pest and interfering with normal metabolism.



SPRAY TIMING and RATES

DORMANCY SPRAY (SACOA STIFLE® DORMANT SPRAY OIL)

- Dormant oil applications provide the best control of San Jose scale and should be used where infestations are heavy. In recent work Biopest & Stifle applied as dormancy sprays were found to effectively reduce mite outbreaks over summer.

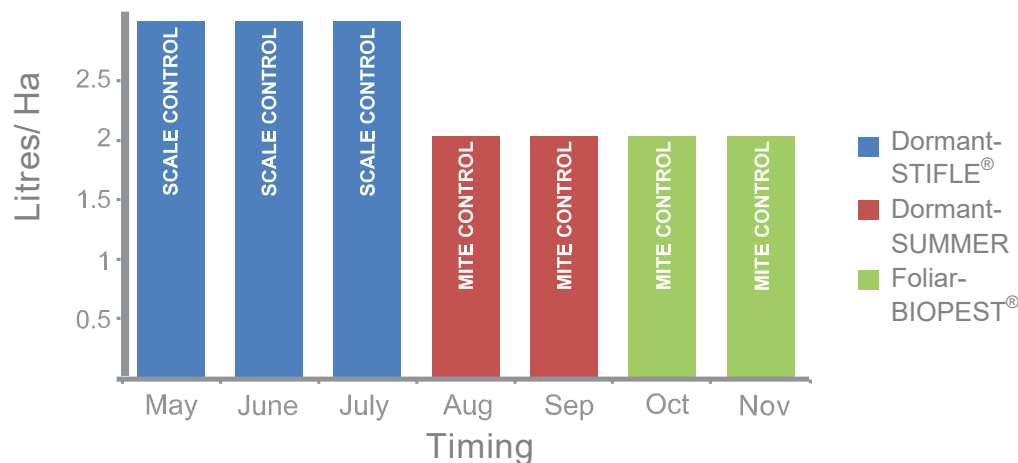


DELAYED DORMANT SPRAY (SACOA SUMMER INSECTICIDAL SPRAY OIL)

- Applications after bud break but prior to flowering provide better control of European Red Mites and moderate control of San Jose scale.

FOLIAR COVER SPRAY (SACOA BIOPEST® PARAFFINIC OIL)

- Application immediately after petal fall at 1-2% provides effective control of European Red Mite eggs that are about to hatch or the larvae stage of the mite. This approach fits well within the resistance management strategy for this pest. Biopest is also an ideal tank mix partner for common miticides such as abamectin improving their activity by increasing coverage and leaf uptake.



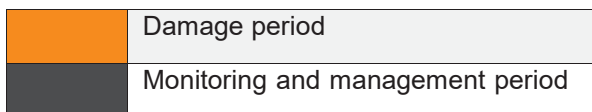
STIFLE® RATES

- STIFLE® offers the following registration for use in Almond IPM programs. Rate represents litrage in dilute spray per 100L water.

Pest	State	Rate per 100L	Comments
Mites (ie European Red Mite)	NSW, ACT, VIC, SA	2-3L	Dormant
Scale (ie.San Jose Scales)	NSW, ACT, VIC, SA, WA only	2-3L	Dormant

The following chart indicates when various pests are active or when symptoms can be observed in orchards. Timing for the treatment of these pests is also included.

Pest	Month											
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Carob Moth						■	■	■				
				■	■	■	■	■				
Bryobia Mite			■	■	■							
	■		■	■	■	■	■	■				■
European Red Mite				■	■	■	■	■	■			
	■		■	■	■	■	■	■				■
Indian Meal Moth								■	■	■	■	
								■	■	■	■	
Light Brown Apple Moth			■	■	■	■						
				■	■	■	■	■	■	■		
Rust Mite			■	■	■	■						
	■	■	■	■	■	■	■	■				
San Jose Scale			■	■	■	■	■	■	■	■	■	
	■	■	■	■	■	■						■
Tomato Russet Mite				■	■	■	■	■	■	■		
	■	■	■	■	■	■	■	■				
Two Spotted Mite						■	■	■	■			
			■	■	■	■	■	■	■			



Critical Application Principles

STIFLE®'s use as a standalone insecticide in registered applications such as almonds involves five key principles:

1. High water volumes
2. Rates of between 2% - 3%
3. Ideally, multiple applications
4. Thorough coverage of the plant
5. Constant agitation in the tank

The following table expands on these principles.

Factor	Recommended Action
Water Volume	For small to medium sized trees (i.e. to 3m) - 1,000 - 1,500L per Hectare. For large trees (i.e. 3m +) - 2,000 - 5,000L per Hectare.
Spray Pressure	We do not recommend adjusting spray pressure to change the litreage as this will affect the size of the spray droplet and possibly compromise coverage.
Coverage	All parts of the tree must be completely covered in spray.
Applications	A multiple application approach is generally recognised as providing maximum pest control.

Follow Proper Tank Mixing Procedures

Check labels and do a jar compatibility test prior to tank-mixing. Check to make certain that the oil emulsifies if adding other dry flowables or wettable granule pesticides. Cheaper quality pesticides can be of questionable quality, particularly copper formulations.

MIXING INSTRUCTIONS

1. Add water to the mixing tank to allow proper agitation by pump or paddles.
If wettable powder formulation – mix water and powder thoroughly so that powder is totally suspended in the water before the oil is added.
2. Add other desired pesticides.
If other pesticides to be added are an emulsifiable formulation, do so after the oil and the water has been thoroughly mixed.
3. Add oil under agitation when tank is $\frac{3}{4}$ full. Top off with water to form a milky solution.
4. Maintain agitation until solution is completely used.
5. It is important for users to read and follow all instructions on the labels of the proposed tank mixed products.
6. Flush fluid in sprayer hose lines back into tank reservoir if fluid is allowed to stand for more than 20 minutes.

COMPATIBILITY

1. Do not use spray oil with Dimethoate, Chlorothalonil, Captan, Carbaryl or any other product containing Sulphur.
2. SACOA's Spray Oils are compatible with mancozeb, most copper-based formulations and many other pesticides. Refer to product labels or contact SACOA to confirm compatibility with other specific actives.
3. If possible, either keep the spray equipment used for these compounds separate from the equipment used for Petroleum Spray Oil or make sure that the sprayer is thoroughly cleaned, so that no residue from these compounds remain.

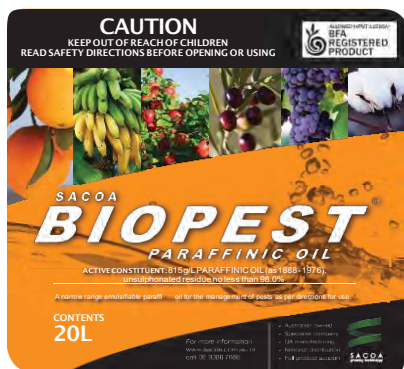
SACOA'S ALMOND PRODUCT RANGE



SACOA STIFLE® DORMANT SPRAY OIL

SACOA STIFLE® Dormant Spray Oil (STIFLE®) is an emulsifiable, highly refined, agricultural spray oil formulated to control a variety of pests and diseases during the winter dormant period up until budburst / green tip stage.

It is a highly effective controller for a variety of pests including mites, thrips, scale and other pests on Almond trees.



SACOA BIOPEST® PARAFFINIC OIL

SACOA BIOPEST® (BIOPEST®) is a highly refined iso-paraffinic oil designed for use as a fungicide, insecticide, to manage certain aphid-transmitted viruses and as a premium carrier / adjuvant.

Independent trials conducted in New South Wales and Queensland indicated BIOPEST® to be the most effective petroleum spray oil (when used in conjunction with Integrated Pest and Disease Management programs) available in Australia.

With an unmatched level of purity BIOPEST® represents the most advanced attempt yet to provide orchards with an IPM product capable of controlling multiple, unrelated pests and fungal diseases simultaneously.

As a spray oil, BIOPEST® is ideally suited to organic farming. Organic registration for BIOPEST® with BFA was obtained in 2012.



SACOA SUMMER INSECTICIDAL SPRAY OIL

SACOA SUMMER Insecticidal Spray Oil (SUMMER) is a high quality horticultural spray oil. SUMMER offers an effective, proven formulation that you can be confident using in your orchard. With increasing pressure to reduce the use of chemicals in the environment, spray oils such as SUMMER are an important part of the pome and stone fruit pest and disease management programs.