

# USING SACOA HORTICULTURAL OILS ON FRUIT TREES

## TECH NOTE SERIES



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### KEY POINTS

- Target correct pest and tree stage.
- Ensure thorough coverage and penetration of canopy to reach the target.
- Consider whether to use dormant or foliar applications.
- SACOA's products use premium, highly refined isoparaffins which exclude some of the aromatics without affecting their effectiveness against mite pests.
- Ensure correct mixing practices.

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 lack the purity of modern formulations and as a result, green foliage was often damaged upon application. Thus, the sprays were mainly applied during the dormant season.

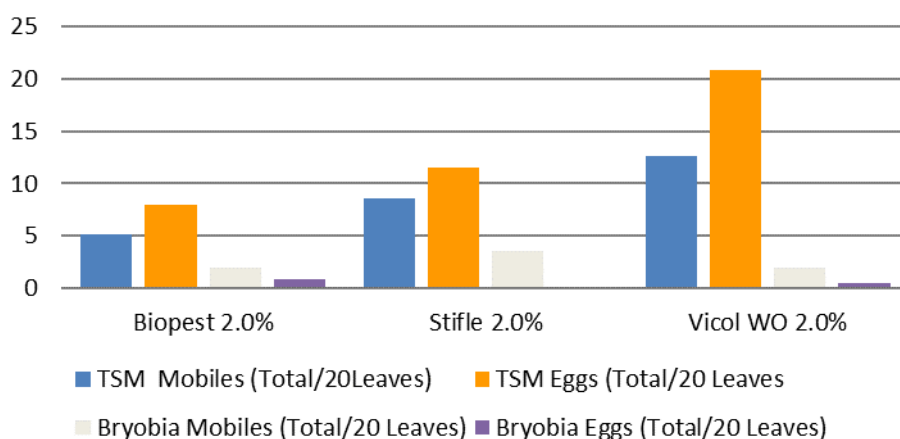
### SACOA'S HORTICULTURAL OILS

SACOA's new technology horticultural oils are pharmaceutical grade isoparaffins, which are far superior than the oils used in horticulture in the past.

BIOPEST® has a very narrow distillation range, which excludes some of the heavier plant-

damaging components (aromatics) without affecting its effectiveness against mite pests.

### Efficacy on mites



**Graph 1:** Two-spotted mite (TSM) and Bryobia mite control with dormant sprays in almonds. Assess 3 22/1/15. All treatments applied 1/7/14 in 2500L/Ha water. (Source: Phytogen Consulting 20.2.15)



**Image 1:** European red mite  
(Source: WA Department of Agriculture and Food).

Field research trials conducted in commercial and experimental orchards in Australia and overseas during the past few years, have shown the effectiveness of using a highly refined isoparaffin oil like BIOPEST® to control mites throughout the summer.

With the highly refined, isoparaffin oils, the application timing has been modified to correlate with the development of the insect pest. These oils are less damaging (phytotoxic) than traditional summer oils to fruit trees when applied correctly.

### DORMANT SPRAYS

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

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

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- 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.
- Dormant oil applications provide the best control of scale and should be used where infestations are heavy.
- Green-tip applications provide better control of European red mites and moderate control of scale.
- Failure to apply either a dormant or delayed-dormant oil may require additional in-season treatments. These are not only more costly, but are more disruptive to beneficial arthropods that keep secondary pests under control. Recent independent trial work in almonds commissioned by SACOA indicates the use of a well timed dormant spray, particularly with a higher quality oil like **BIOPEST®**, can reduce the level of in-season mite pressure.

## SUMMER SPRAYS

Until the 1970's, when a number of highly effective contact miticides became available, it was common practice for growers to include a low rate (1 % or 1L/100L water) of the standard emulsified white oil in each of their summer cover sprays. This provided some constant, although incomplete, suppression of European red mite populations by controlling the most susceptible stages, primarily eggs. Higher dosages were avoided in warm weather conditions to prevent potential foliar damage.

However, with the onset of tolerance

or resistance to conventional miticides, and as oil refining techniques improved by removing more impurities, products such as SACOA's **SUMMER OIL®** and **BIOPEST®** were developed, resulting in less damage to green tissue.



**Image 2:** Small necrotic leaf lesions resulting from high-rate (>2%) applications of traditional summer oils take place under poor drying conditions. (Source: SACOA)

## POST-BLOOM AND COVER SPRAYS WITH ISO-PARAFFIN HORTICULTURAL MINERAL OIL

Grower interest and experience with isoparaffin oils use in the post-bloom, foliar period has increased in recent years and several research projects have been investigating this further. Finding alternative foliar control options with the loss of broad spectrum insecticides such as endosulfan is a key research area for SACOA.

Traditional summer horticultural oil sprays will not, in most cases, provide the degree of control with one spray that we have come to expect from most conventional insecticides. They will provide a useful tool for controlling or suppressing many orchard pests, particularly in orchards using pest control programs that preserve natural enemies. Growers using codling moth mating disruption or producing fruit

organically will be among the first to find benefits in combined summer oil use.

### Apples

Apple fruit tree oil sprays are used in controlling mites including European red mite, scale insects and some thrips and aphids. If the grower has not had a problem with these insects previously, one oil spray application at the tight cluster to pre-pink stage is recommended. If there is a known insect problem, two oil applications are necessary. Apply the first between bud burst and the half-inch green stage and the second with **BIOPEST®** or **SUMMER®** at the tight cluster to pre-pink stage.



**Image 3:** Using traditional summer sprays may result in a tendency for increased "scarf skin" in some varieties such as Jonathan. (Source: SACOA)

### Pears

Pears require two applications of an oil spray to control pear rust mite, blister leaf mite, European red mite and scale insects. Spray the first application at the swollen bud stage of development on a warm day. The second application is sprayed between the green cluster stage and the development of the white bud, or "popcorn" stage.



### Peaches, Nectarines and Apricots

Peaches, nectarines and apricots should have an oil spray applied before the swollen bud stage. This will control European red mite and San Jose scale.

### Plums and Prunes

Spraying plums and prunes before the swollen bud stage of development will control scale insects and mites.

### Cherries

Cherries require only one oil spray application at the beginning of the swollen bud (bud burst) stage. This will control scale insects, aphids and European red mite. Further research is underway to understand the efficacy of *BIOPEST*® on cherry slug.

Yellowing leaves are the first sign of summer oil phytotoxicity and indicate that the rate of oil should be reduced for any subsequent applications.

When using *BIOPEST*® there is no risk of potential phytotoxicity damage unlike traditional summer oils where the risk is high.

Cultivar, adequate moisture, and spray drying conditions should be considered before using summer oil to minimise detrimental effects on fruit finish.

## CHARACTERISTICS OF OLDER TECHNOLOGY SPRAY OILS

Oil has questionable or limited compatibility with many pesticides. However, some commonly used miticides require an oil for full activity. Check labels and conduct a jar compatibility test prior to tank-mixing.

Certain spray materials, like captan or Morestan®, cannot be applied

soon before or after oil sprays (30 days) because of the risk of damage to foliage and fruit. Trees are at more risk of damage when treated with oil rates that are too high, during high temperatures (+35°C), or when trees are stressed (see Figure 2).

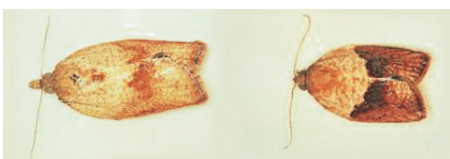
## CONTROL OF UNRELATED PESTS AND DISEASES

SACOA's spray oils are effective against a range of orchard pests and pest resistance to spray oils has never been observed. In addition, spray oils are minimally disruptive of biological control, with no residual effect on most natural enemies. Pest resurgence following application is uncommon.

For these reasons, spray oils are often a good fit with soft pest control programs, such as those using mating disruption for codling moth control.

Anecdotally, *BIOPEST*® oil applications for mite control provide good knockdown of European red mite and pear rust mites.

With prophylactic applications behaviour modification has been seen in other insect pests such as leaf rollers, light brown apple moth and oriental fruit moth.



**Image 4:** Light brown apple moth - female (L) and male (R)

(Source: The Australian Wine Research Institute)

Anecdotally, foliar applications on apples made repeatedly in November and December, results in fair-to-good control of powdery mildew under heavy disease pressure, with no leaf or fruit damage seen.

In addition, *BIOPEST*® may control

woolly aphids when being applied for powdery mildew control on apples in November and December.

## APPLICATION AND TIMING

SACOA recommends making two to three applications on a preventive schedule immediately after the bloom period, before mite populations have a chance to build. The first application can be any time from petal fall to 1-2 weeks later, followed by two or three additional sprays at 10 – 14 day intervals. These will destroy any possible late infection or hatchings and the requirement for follow up treatment and fruit damage is negligible.

If mite pressure is still medium at harvest, an additional application may be required post harvest with hygiene sprays of copper or other fungicides.

### Plant Damage

Oil injury generally appears as swollen and cracked lenticels and/or bark blistering. It is caused mainly by double deposit (allowing one side to dry before the other side is sprayed), by concentrate sprays or by application when low temperatures (below 2°C and particularly below freezing) occur within 24 hours, especially on Delicious.





BIOPEST® Oil may cause fruit spotting and phytotoxicity if used within 10 days before or after captan, carbaryl (Sevin®), or oxythioquinox (Morestan®). The safe interval is much longer for sulphur (30 days).

Sulphur has russeted fruit when sprayed post bloom at above 24°C and may cause leaf spotting on Delicious and some other cultivars when combined with captan. Do not interpret this damage as oil damage.

Oil can cause leaf damage (phytotoxicity) under cool temperatures, high humidity, or wet conditions because the leaf does not have sufficient wax (cuticle) to protect itself. The oil also breaks down on the leaf when exposed to near freezing temperatures.

Oils should only be applied under quick drying conditions. Growers should also take care to maintain good agitation in the spray tank and check to make certain that the oil emulsifies if adding other dry flowables or wettable granule pesticides. Cheaper quality pesticides can sometimes be of questionable quality, especially copper formulations. Always conduct a jar test prior to mixing large volumes.

## REFERENCES

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- Phytogen Consulting 20.2.15

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