

# ParaMite®

## Insect growth regulator for the control of six spotted mites in avocado

ParaMite is a new selective miticide for the control of 6-spotted mites in Avocado.

- New Chemical Class
- Effective against all stages of the Mite life cycle.
- Soft on beneficials
- No cross resistance with current classes of miticides
- Low toxicity
- Low environmental impact
- Translaminar movement through the leaf, providing control where mites feed.
- No need for additional surfactants or oils

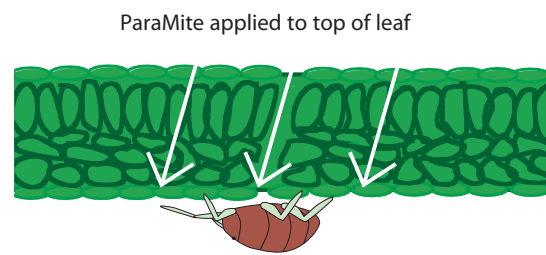
### Mode of Action - Break the Cycle

ParaMite is effective at all stages of the mite lifecycle. ParaMite is ovicidal, having excellent contact activity against eggs. ParaMite also inhibits the moulting process of the larvae and nymphs stages of mite development. ParaMite has limited activity on adults but sterilises adult females.

This range of activity against the whole lifecycle greatly extends the period of effective control compared to other miticides products. ParaMite stops mite population development in its tracks.

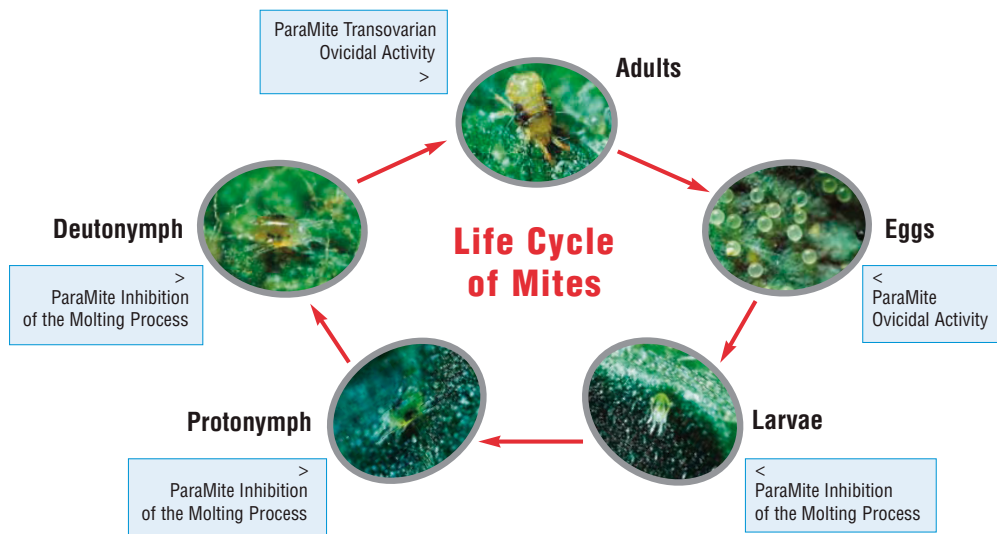
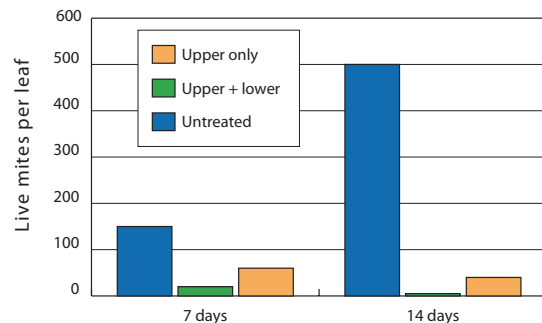
ParaMite is translaminar, and will move through the leaf from contact point to where mites are feeding, greatly enhancing coverage and mite control.

### Translaminar movement



Leaf cross-section  
Translaminar movement of ParaMite

Translaminar activity in beans



## Recommendations for use

ParaMite is best suited to early application before nymphs turn into adults as it has limited effect on adults and they will continue to feed and cause damage until they die. Correct timing requires careful monitoring.

If a strong adult population of mites is already present it is best to use a knockdown miticide first, prior to using ParaMite.

Only one spray of ParaMite should be used per season. Use in rotation with miticides from different chemical groups as part of your management program.

The addition of surfactants or oil to the tank with ParaMite has not been demonstrated to increase efficacy.

## Resistance Management

The active ingredient in ParaMite, etoxazole, is a new chemical class of miticide with a novel mode of action. It has no known cross resistance to existing miticides in New Zealand. This makes it an important part of a rotation program for resistance management.

## Other Miticides in use in the New Zealand Avocado Industry

Active Ingredient	Active Site
Etoxazole	Mite growth regulator
Abamectin, Milbermectin	Chlorine channel inhibitors

Note: Mites are notorious for developing resistance against miticides. To avoid the development of resistance in the future, do not apply more than one application per season. Rotate with other miticides of different activity groups. The decision to apply should be based on monitoring of mite levels and thresholds.

## Beneficial Safety

ParaMite is highly effective against six spotted mites but safe on beneficial insects, ensuring an excellent fit into the IPM program.

Pest Attacked by beneficial insect	Beneficial insect	Effect of ParaMite on beneficial Insect
Aphids, mealybug, two spotted mite (TSM) and European red mite (ERM)	Beetles (Stethorus and ladybug)	None to low toxicity
TSM and ERM	Predatory mites	Moderate toxicity
Aphids, Scales and Mealybug	Lacewings	None to low toxicity
LBAM, Mealybug, Woolly Apple Aphid	Wasps	None to moderate toxicity
Caterpillars and Thrips	Bugs (Pirate bugs)	Low toxicity

Table is a summary of data from Japan, USA and Australia.

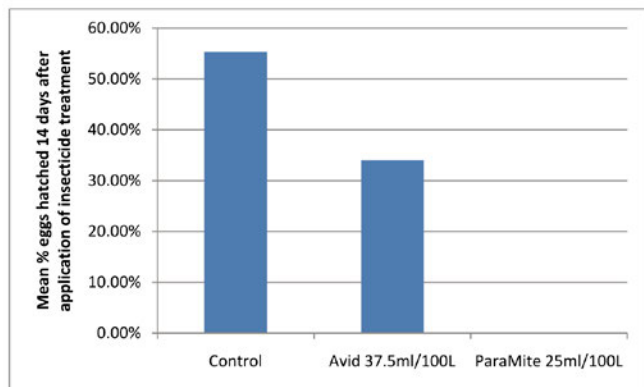
## Worker and Environmental Safety

ParaMite has very low environmental impact and has low human health toxicity.

Active Ingredient	ERMA Controls on formulated products in NZ
Etoxazole	6.9A 9.1A
Abamectin	3.1D 6.1D 6.3A 6.4A 6.8A 6.9B 9.1A 9.2C 9.3B 9.4B
Milbermectin	3.1C 6.1E 6.3B 6.4A 9.1A 9.2C 9.3C 9.4B

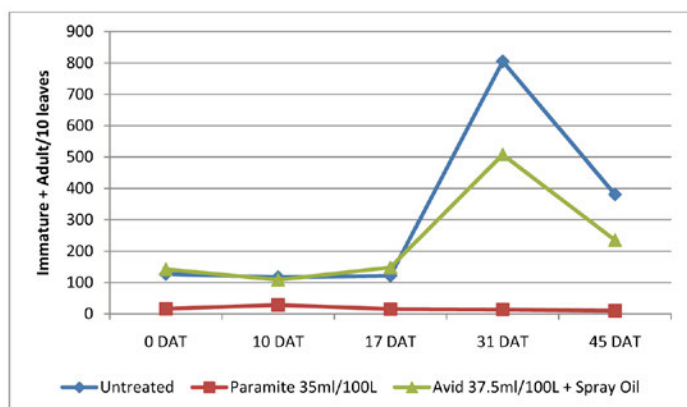
## Trial Results

**Table 1.** Six spotted mite egg hatch post application, laboratory trial.



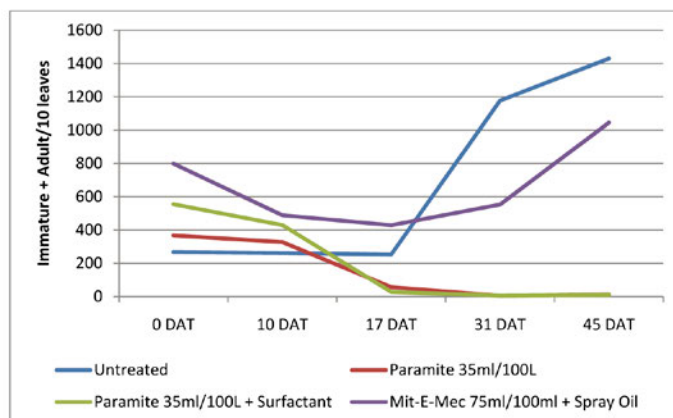
Plant and Food Research – Lisa Jamieson, 2008

**Table 2.** Trial 1. Bay of Plenty Oct/Nov 2009 – Six Spotted Mite on Hass



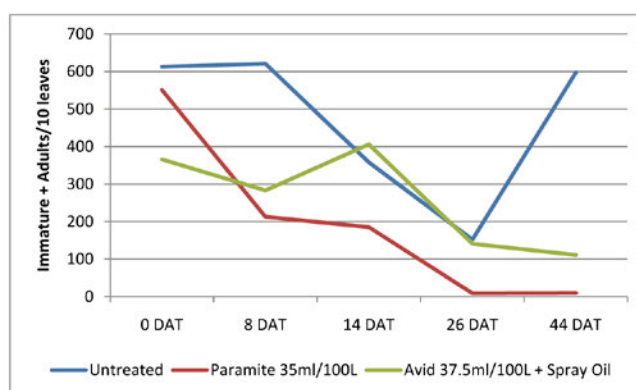
Peak Research – G.P. Mackisack

**Table 3.** Trial 2. Bay of Plenty Nov/Dec 2009 – Six Spotted Mite on Hass



Peak Research – G.P. Mackisack

**Table 4.** Bay of Plenty Nov 2008 – Six Spotted Mite on Hass



Peak Research – G.P. Mackisack

## Directions for Use (Read label fully before use)

It is an offence to use this product on animals.

### Restrictions

DO NOT use on avocado trees that are under stress from disease, lack of moisture or nutritional deficiencies.  
DO NOT apply more than 1.05 L product per hectare.  
DO NOT apply more than once a year.  
DO NOT apply by aircraft.

This product shall be applied via ground based application method only.

### Withholding Period

It is an offence for users of this product to cause residues exceeding the relevant MRL in New Zealand (Maximum Residue Limits of Agricultural Compounds) Food Standards. Do not harvest for 14 days after application. For export markets (other than Australia) contact your exporter.

Crop	Pest	Rate	Critical Comments
Avocado	Six spotted mite ( <i>Eotetranychus sexmaculatus</i> )	35 mL per 100L	ParaMite is a mite growth regulator that causes adults to lay sterile eggs and stops existing eggs and nymphs developing. Control of these stages is generally achieved within 7-14 days. ParaMite also has translaminar and residual activity which means control of the population may last for four to five weeks. However, it does not control adult mites, which may live for two to three weeks. To give effective long term population control ParaMite should therefore be applied at the first signs of mite crawlers. Once large numbers of adults are present it may be necessary to apply a miticide from a different group to control the adults immediately and reduce potential damage. Good coverage is important for ParaMite to be effective, so the water volume should be no less than 750 L/ha. Concentrate spraying is not recommended. On larger trees water volumes up to 3000 L/ha may be required. It is an offence to apply more than 1.05 L ParaMite per ha.

Avid – Registered trademark of Syngenta Group Company.

Mit e Mec – Registered trademark of Sankyo Agro Co. Ltd Japan.

To ensure growers get the best results from GroChem products all product trials are conducted by independent consultants or organisations. GroChem are proud to manufacture products right here in New Zealand. Designing formulations specifically for New Zealand's unique growing environment. For product registration and active ingredient details see [www.grochem.co.nz](http://www.grochem.co.nz)

**PARAMITE**