

# CONTROL OF RED SPIDER AND FALSE SPIDER MITES ON ORCHIDS



BY CHARLIE TRUSCOTT

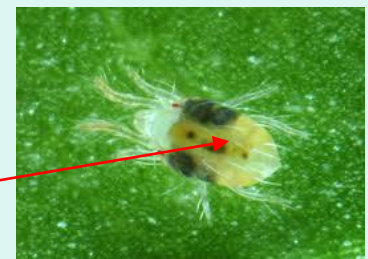
# AN OVERVIEW OF WHAT WE WILL COVER TODAY

- HOW TO IDENTIFY THE **PROBLEM** MITES ON YOUR ORCHIDS.
- **LEARN ABOUT THEIR LIFE CYCLE, SO YOU CAN IMPLEMENT THE CORRECT CONTROL MEASURES AND TIMING.**
- HOW TO RECOGNISE THE PRESENCE OF SPIDER MITES THROUGH DAMAGED LEAVES.
- **USING CHEMICAL CONTROL MEASURES.**
- USING LESS TOXIC CHEMICAL CONTROL MEASURES.
- **USING BIOLOGICAL CONTROL MEASURES**
- NATURAL PREDATORS OF SPIDER MITES
- **HOME REMEDIES THAT WORK**

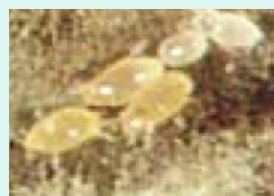






False Spider Mite

Red Spider Mite



# IDENTIFICATION OF DIFFERENT TYPES OF MITES



	<u>Plant feeders</u>	<u>Fungi feeders</u>	<u>Scavengers</u>	<u>Predators</u>
Colour	Green, brown or dirty red. Not bright red.	Transparent, or opaque to off white. Black or very dark brown. Not red.	Off-white to pale pink, often with a white longitudinal stripe. Not red.	Often bright red. Pale yellow through to mid brown. A few are bright yellow or orange.
Movement	Spider mites walk fairly quickly when disturbed. Other plant feeders walk very slowly.	Move slowly or very slowly when disturbed.	Run rapidly when disturbed. Front legs 'twitch' as though the mites are nervous.	Most are fast moving hunters, and run very quickly when disturbed.
Location	Exposed locations on the leaves and fruit. 	Usually found around sooty mould or debris, especially under the calyx. 	May occur in large numbers around patches of sooty mould and debris. 	Exposed locations on the leaves and fruit. Some aggregate in small groups under leaves. 

# OTHER TYPES OF MITES



Six spotted Mite



Red Palm Mite



Avocado Brown Mite



Predatory Mite

# WHAT ARE SPIDER MITES

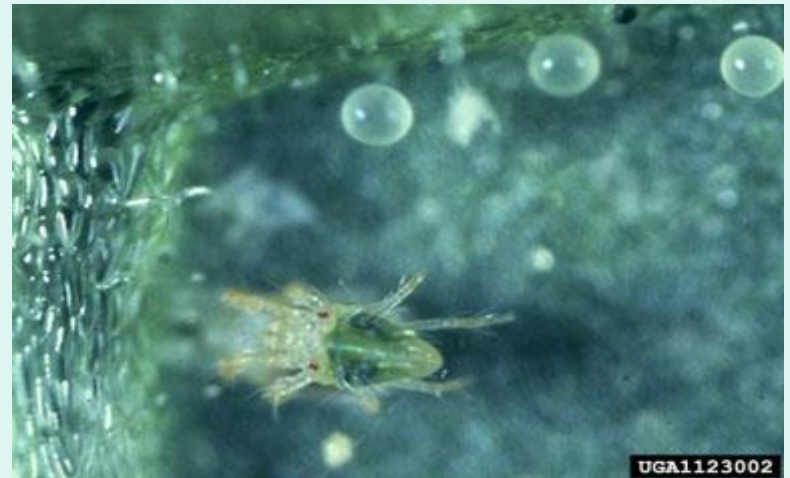
- Mites are tiny creatures related to spiders and ticks, and are not insects.
- Plant-feeding mites can be thought of as plant parasites and are often amongst the most serious pests to cultivated orchids.
- The two mite species that are pests on cultivated orchids are, the two-spotted and false spider mite (or flat mite).



# IDENTIFICATION OF THE PROBLEM

## MITES ON YOUR ORCHIDS

- **Two-Spotted Mites** are also known as spider mites or red spider mites. Two-Spotted are very small (0.5mm).
- Difficult to see without magnification.
- Microscopic pearl like eggs.
- Adults can be yellow-green with a large dark spot on each side of the abdomen. With the onset of cooler conditions in autumn they become reddish-orange, and eventually lose their characteristic dark body spots, although they retain the bright red eye spots.
- Male is smaller and has a more pointed abdomen, whereas the female is approximately 0.65mm long and oval in shape.
- Nymphal mites closely resemble adults, but are generally smaller and paler in colour.



# TWO-SPOTTED MITE

## CONTINUED



# TWO-SPOTTED MITE CONTINUED

Two-spotted mite is the single most important pest of ornamental plants and cut flowers in Australia, causing premature leaf and bud drop. It is a serious pest to outdoor crops, including strawberries, grapes, blackcurrants, bananas, raspberries, kiwifruit, sweet corn, maize, peas and tomatoes.

Also found on capsicums, melons, roses, carnations etc.



When looking for spider mites place a piece of white paper under the leaves then shake the foliage and mites will drop onto the sheet of paper.

# LEAF DAMAGE CAUSED BY TWO-SPOTTED MITES

Red Spider mite feed by puncturing the epidermal cells of the leaves from which they suck the chlorophyll. This turns the leaves yellow, and they eventually drop off.

Other symptoms include conspicuous pale-coloured spotting visible on the upper surface of the leaves. They also secrete a very fine silk-like webbing under the leaves, which causes the leaves to **appear silvery**. The webbing protects them from enemies and chemical sprays. Females leave plants via threads of webbing blown on the wind or they drop off a plant and crawl to a new plant.

Leaves may **have brown to black marks** as well, possibly due to fungal attack in the damaged cells. This damage generally reduces the vigour of the plant. Mites may also transmit certain viruses.



# IDENTIFICATION OF THE OTHER PROBLEM MITE – FALSE SPIDER

- False Spider Mites, but the name flat mite is preferred, as it is accurately descriptive and avoids confusion with Red spider mites. Flat mites are native to tropical and subtropical areas.
- Flat mites are smaller than two-spotted mite, adults being only 0.3mm in size.
- Oval and flat in shape.
- Dirty green to red in colour.
- Lays small red eggs.
- They do not spin webs like two-spotted mite.
- Sometimes referred to as the Phalaenopsis mite as they are a well known pest on Phalaenopsis plants.



# FALSE SPIDER MITE

## *Flat mites - family Tenuipalpidae*

Small (~0.3 mm in length), barely visible without magnification.

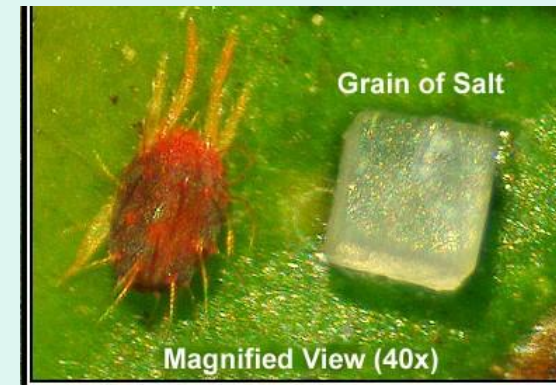
Oval and flattened in shape.

Dirty green to red in colour.

Stationary when feeding, move slowly when disturbed.

Small, red eggs laid singly in protected places on the leaves and fruit.

Citrus flat mite -  
*Brevipalpus lewisi*  
Worldwide  
distribution,  
Interstate  
quarantine risk:  
low  
International  
quarantine risk:  
dependent on  
destination



# FALSE SPIDER MITE CONTINUED



False Spider mites do not spin a web

# DAMAGE DONE TO LEAVES FROM FALSE SPIDER MITES

Flat mites often feed on the upper surfaces of leaves and this will create a pock-marked appearance from empty and collapsed leaf cells. This type of damage is particularly easy to see on infested Phalaenopsis leaves. Flat mites usually feed on thin leaves, particularly the underside, and damage is similar to the stippling caused by Two-Spotted mite, but there is no webbing.



# LIFE CYCLE OF SPIDER MITE

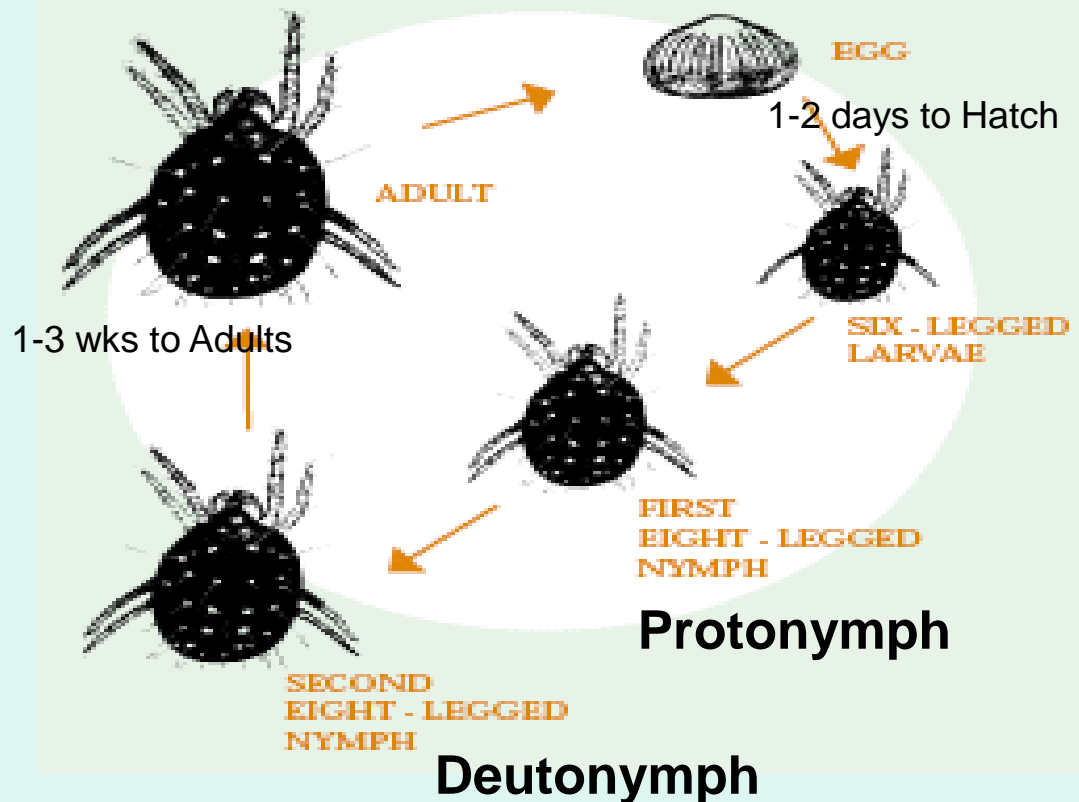
Developmental rates of mites are dependent upon temperature. In general, the **higher the temperature the shorter the life cycle**.

The egg may take upwards of **3 wks** to hatch for **flat mites**, but only **1-2 days** for **two-spotted spider mites**, at standard indoor temperatures.

While larval & nymphal stages usually take **5-6wks** to reach adulthood for flat mites, it may take only **1-3 wks** for **two spotted mite**.

While flat mites take 6-9wks to complete a generation, two spotted mite can take as little as 7 days in optimum conditions.

**Adult mites live from 2-3 weeks.**



# WHERE DO THEY COME FROM

- Typically, mites are always present in low numbers. This makes managing cultural conditions important for mite control. Mites will readily move between plants, float on air currents, be introduced on new plants or contaminated from other plants at shows, meetings etc.
- Outside trees and plants can harbour mites, for example mango trees attract great numbers of mites.
- Colonization of your plants by mites can be done at any time, but severe problems may not show themselves until **favourable environmental** conditions are present. (**Hot, dry & rain-less conditions**). They thrive in dusty conditions



# CONTROLLING SPIDER MITES WITH THE PROPER CHEMICALS

- The following miticides are very effective as a quick knock down for spider mites: **SORCERER, OMITE, STEALTH, ACRAMITE, VERTIMEC, ABAMECTIN, FLORAMITE & TALSTAR.**
- **IT IS ALSO RECOMMENDED TO MIX WITH AN OVICIDAL MITICIDE LIKE PARAMITE OR APOLLO TO KILL THE EGGS LEFT BEHIND.**
- WHY USE CHEMICAL CONTROLS. Large persistent populations of mite infections usually demand the need for synthetic pesticides, especially in commercial and large orchid collections, where fast knock down is required. People should be aware that most common insecticides are not effective against mites. Pesticides designed for mite control are called miticides.

# CHEMICAL BRAND NAMES AND THEIR CHEMICAL MAKE UP

Brand Name

Chemical Constituent

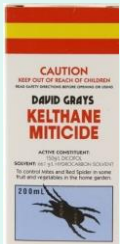
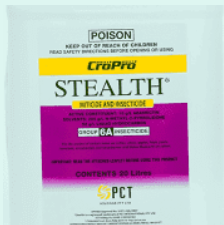
Stealth — Same Chemical Group → Abamectin  
 Vertimec — Abamectin  
 Sorcerer — Abamectin

Acramite — Same Chemical Group → Bifenazate  
 Floramite — Bifenazate

Kelthane — Same Chemical Group → Dicofol  
 Farmos Mitifol — Dicofol

Talstar — Bifenthrin

Mibeknock — Milbemetin



**All these chemicals are for Adult & Nymphs mite Quick knock down only**

# WHAT ARE THE ADVANTAGES OF USING AN OVICIDAL CHEMICAL

## 1. Long lasting Control 4-6 WKS.

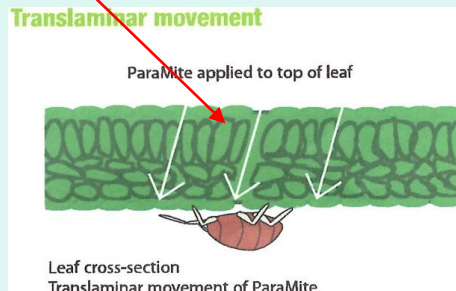
1. Stops Eggs, Larvae & Nymphs development on contact & sterilises adult females.

2. No cross resistance to existing miticides.

## 3. Insect growth regulator

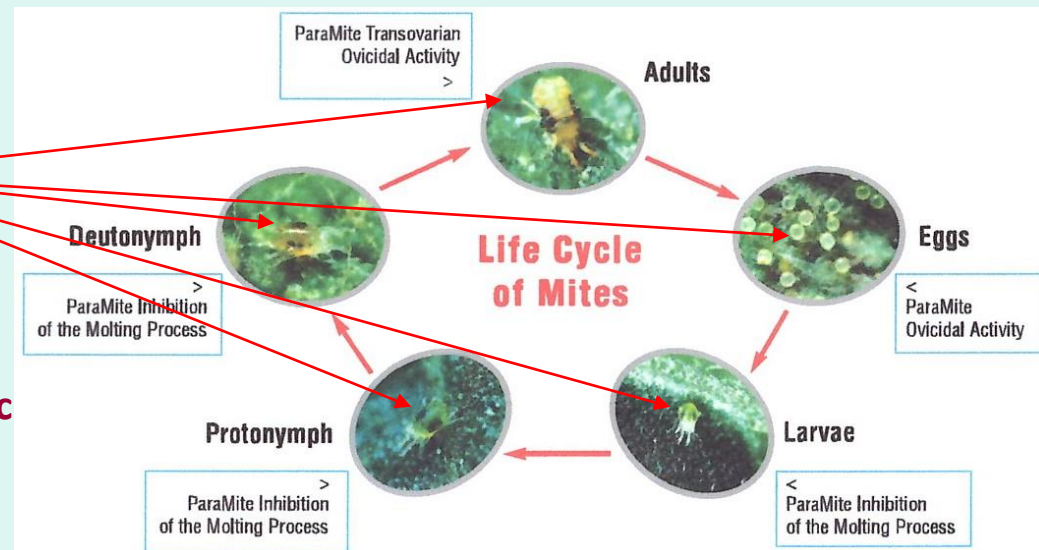
4. Safe on beneficials like bees, Predatory Mites, Lacewings & lady beetles & Parasitic wasps.

5. Translaminar movement through top of leaf.



# ParaMite®

New Ovicidal Type  
Chemical - Etoxazole



6. Low Toxicity

# COMPARISON OF OVICIDAL TYPE CHEMICALS

## PARAMITE VERSUS APOLLO

Apollo - Has no effect on larvae or adult mites, but kills developing embryo in the egg.

Paramite - Inhibits moulting process of larvae & nymphs limited activity on adults, but sterilises the adult females.

Apollo - Residual Activity up to 45 days.

Paramite – Residual Activity 4-5 weeks.

Apollo – Low Toxicity safe for bees, predatory mites and beneficial insects.

Paramite – Low Toxicity safe for bees, predatory mites and beneficial insects.

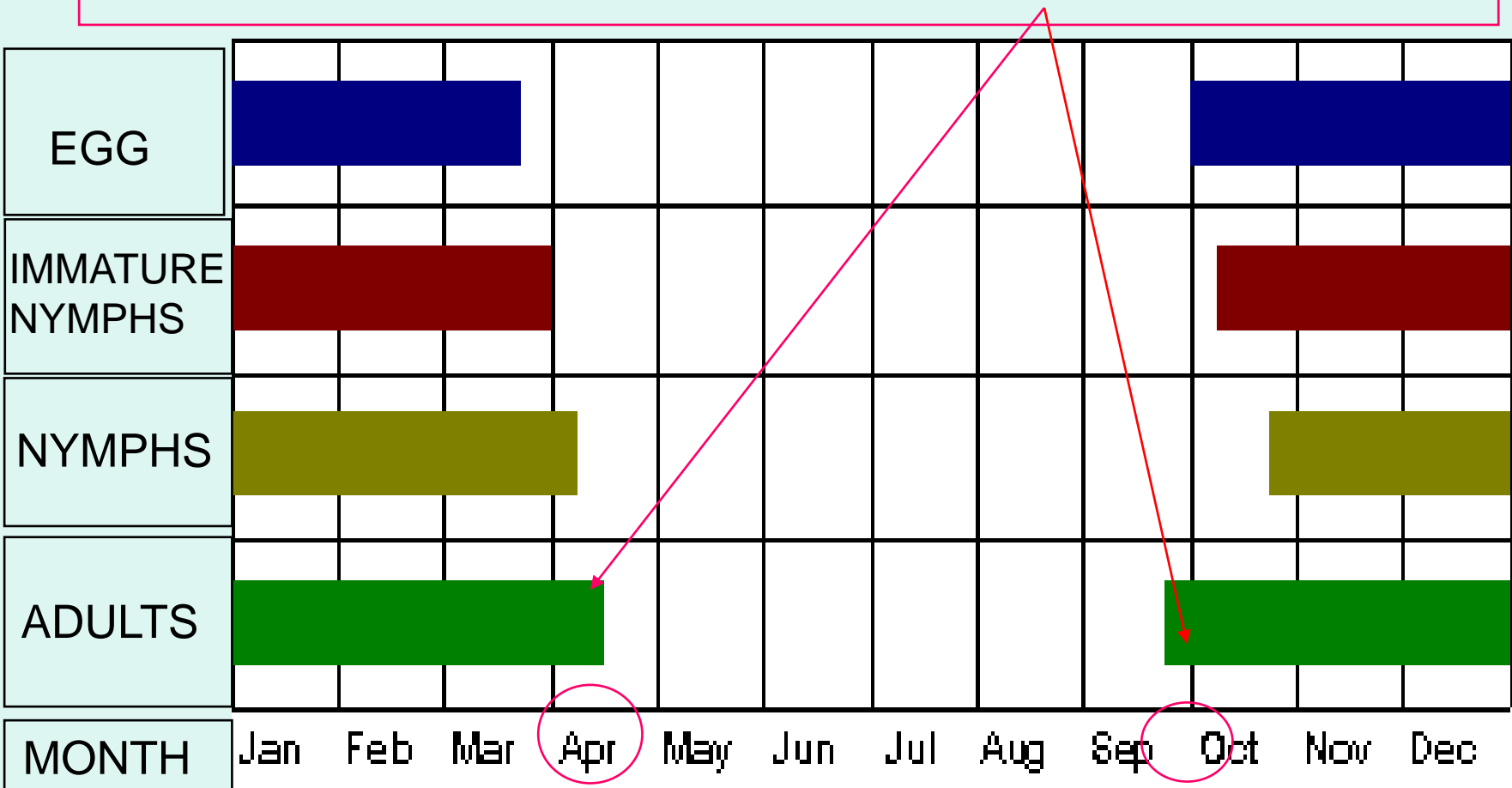
Apollo – Complete coverage required

Paramite – Has Translaminar movement through the top of leaf to the underside where mites feed.



# CORRECT TIMES TO SPRAY FOR SPIDER MITE IS DURING PEAK ACTIVITY PERIODS

SPRAY TWICE A YEAR- ONCE IN THE **SPRING** AND ONCE IN THE **AUTUMN, BEFORE WINTER**. AT THE *PEAK PERIODS, AFTER ORCHID SHOWS*

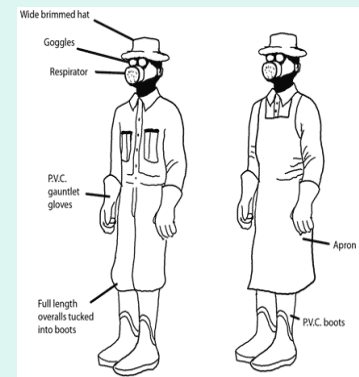


*Note: Coloured Bars indicate periods of Peak Activity in each Of the life cycle stages*

# PROBLEMS USING CHEMICAL CONTROLS

- Apart from the obvious health hazards to humans, if the proper safety protections and precautions are not observed, other problems can arise, when chemicals are used frequently and without proper spraying programmes. Add this to the failure to introduce chemicals from a different chemical group, and it will all lead to mites developing resistance to those chemicals. This has already been seen with the indiscriminate and over use of **Kelthane**, which has almost become ineffective on mite in orchids. For this reason it is recommended that a product be only applied no more than once per season, usually in Spring or Autumn. Use a different product in the other season.
- Mites are notorious for becoming resistant to chemicals.

Use the correct safety protection clothing and equipment.



# LESS TOXIC CHEMICAL CONTROLS – BIOPESTICIDES, ORGANIC MEASURES

- **Insecticidal soap** sprays such as **NATRASOAP** or **Nature's Way Vegie**, as well as horticultural oils, like **PEST OIL**, & **eco-oil** can be effective. These products work by smothering the mites, so a complete coverage of all sprayed plants is essential. Plants usually require 2 applications 3-5 days apart. Avoid spraying when temperatures are higher than 35C, it may cause leaf burn.
- **Eco-Neem** from extracts of the neem tree, works in two main actions, firstly the suppression of the mites appetite ( they starve to death) and by restricting growth (unable to moult). It is also registered as an organic spray.



# LESS TOXIC CHEMICAL CONTROLS CONTINUED

Research has shown **2% Rosemary Oil solution** can kill mites without harming the beneficial predatory mite. Make sure you always dilute the oil prior to spraying it. To make 1 litre of spray use 980 ml of lukewarm water add 10-20mls (2-4 teaspoons) of Rosemary Oil. Add a teaspoon of castile soap made from olive oil and coconut oil, this will help it stick.

A range of other extracts, including **garlic extract, clove oil, mint oil, eucalyptus and cinnamon oil** have also been found to be effective



# HOME MADE SPRAYS THAT WORK - NON TOXIC

- 1 Litre of Water Add
- 2 Teaspoons or 10grams of Baking Soda
- 2 Teaspoons or 10mls of Eco Neem Oil
- 10mls of Dishwashing Liquid
- Shake contents vigorously



# PHYSICAL AND CULTURAL CONTROLS

KEEP IN MIND MITES PREFER HIGH TEMPERATURES, LOW HUMIDITY AND DUSTY CONDITIONS

- There are some easy things you can do that will have a big impact on spider mite numbers. Try a high pressure hosing in the early morning 3 days in a row, concentrating under the leaves.
- Wash dust from leaves.
- Try to control weeds in and around your orchid houses.
- Remove infested leaves and pick up fallen leaves as they all harbour mites.



# BIOLOGICAL CONTROL OF SPIDER MITES

Organic gardeners have an advantage regarding spider mite control. Common organic practices such as making compost, mulching the soil and avoiding chemical Insecticides help to encourage predatory mites, a major predator of two-spotted mite. A healthy garden will have a resident population of predatory mites to keep mites under control. Predatory mites are abundant in the top layers of soil, humus and animal manures.

Two types of predatory mites are available commercially from [www.goodbugs.org.au](http://www.goodbugs.org.au) – They **Are best introduced when pest numbers are low.** They are also available from Bioworks (NSW) & Biomites (QLD).



# MITES NATURAL PREDATORS

- Lacewing, Black and spotted ladybirds, predatory mites, damsel bugs, parasitic wasps and hover fly larvae.



Spotted Ladybird



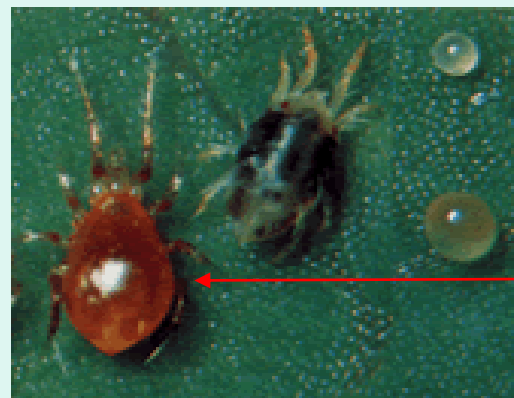
Parasitic Wasp



Hover Fly



Lacewing



Predatory Mite

# FINAL WORD



- **Monitor** your plants regularly.
- Practice **Prevention** by creating a non conducive environment for pests. For example **keep humidity high** in your orchid houses and wash dust from leaves.
- If you use chemical controls **do not spray in the heat of the day** as you may get burning, and cause phototoxicity in the leaves.
- Do not keep using chemicals with the **same active constituent** & no more than once in one season. **Rotate chemicals of a different chemical group, often.**
- Encourage natural predators, especially the predatory mite.
- While Two-spotted mite/false spider mite feeding on the leaf are rapidly paralysed from chemical sprays, **immature mites** may be **seen for up to 7 days after application.** This is because eggs laid on the day of application may still hatch and the resulting mites need to be controlled by a second spray, between 5-7 days depending on the temperature. (Not required if a Ovicidal chemical added as well, for example Paramite or Apollo).
- Immediate action is required if mite numbers exceed 3-5 mites per leaf.
- Consider using Less Toxic Solutions.