

# Montdorensis

## Predatory mite

(under development)

### Biocontrol organism

#### ☞ *Typhlodromips montdorensis*

*Typhlodromips montdorensis* is an Australian species of phytoseiid predatory mite. It was collected in southern Queensland during a project funded by Horticulture Australia, which began in 1994. Due to its recent ‘discovery’, the use of montdorensis in commercial crops is in its infancy and research is continuing.

Montdorensis is a small, pale, pear-shaped mite about the same size as twospotted mite. The gut contents take on a yellowish tinge when it feeds on thrips larvae, pinkish when it feeds on tomato russet mite, and greenish-black or brown when it feeds on spider mite. The eggs are clear and oval, and are laid on the undersurface of leaves (often on hairs), under

the calyx of fruit and sepals of flowers, or on cast skins of aphids and other detritus.

At 25°C montdorensis takes 6–7 days to go through its life cycle from egg to mature adult. A young adult female can lay three or four eggs a day, to a total of more than 50 during her lifetime (about 4 weeks). A female mite kills an average of 14 thrips larvae per day.

### Target pests

- ☞ Onion thrips *Thrips tabaci*
- ☞ Plague thrips *Thrips imaginis*
- ☞ Tomato thrips *Frankliniella schultzei*
- ☞ Western flower thrips *Frankliniella occidentalis*
- ☞ Melon thrips *Thrips palmi*

Montdorensis feeds on a wide range of thrips larvae, but does not attack species such as green-



Plate 26: Montdorensis feeding on western flower thrips larva (left); and montdorensis on capsicum (right)

house thrips (*Heliothrips haemorrhoidalis*) in any numbers. Thrips appear to be its preferred food, but it also feeds on spider mites, broad mites and tomato russet mites, and scavenges on other invertebrates and pollen when thrips are absent.

Montdorensis is being trialled on tomatoes for tomato russet mite. It is one of the few predatory mite species that appear able to survive well on tomatoes, with their sticky glandular hairs, and it consumes russet mite rapidly enough to keep ahead of its fast multiplication.

As with other thrips-eating phytoseiid mites, montdorensis is too small to consume adult thrips or large larvae. Screening and weed management should be used to prevent large numbers of adult thrips from entering the greenhouse. Control options need to be at hand to reduce damaging levels of adult thrips if they

do become established. Hypoaspis (*Stratiolaelaps*) soil-inhabiting predatory mites can also help by killing thrips pupae at ground level.

### Suitable crops/environments

Montdorensis is a warm-temperature mite. It moves, develops and reproduces slowly at lower temperatures, with no activity below 11°C. Adults can tolerate 45°C in greenhouses but eggs and younger stages perish at this extreme. The optimum temperature range is 20–30°C. Short winter days and cool nights will not induce hibernation. As long as the mean daily temperature is warm, the predator will keep working all year round.

Montdorensis is best used as part of an IPM program that covers all pests and diseases in the

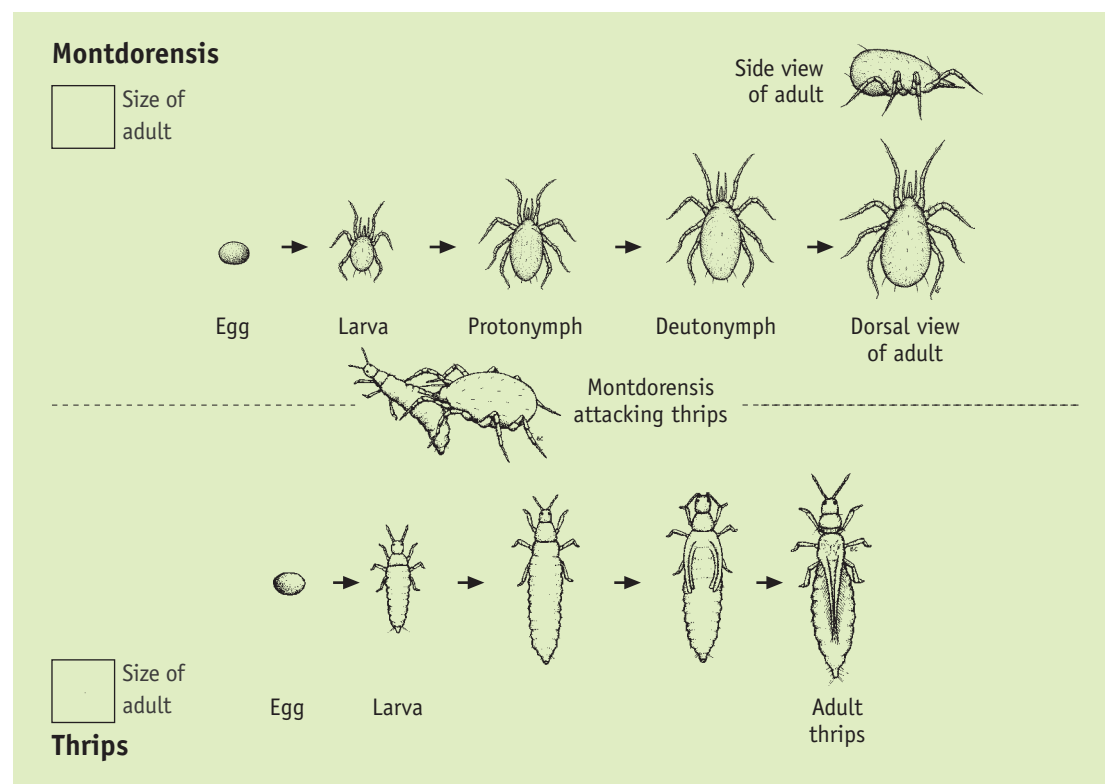


Figure 6: Life cycles of montdorensis and thrips



Plate 27: A bundle of montdorensis eggs (left). Sometimes the mite attaches its eggs to aphid remains (right).

crop; otherwise, pesticide residues are likely to prevent the predator from performing at its best.

In small greenhouse trials, this predator has performed well in cucumber, capsicum, gerbera, chrysanthemum and strawberry crops. It does not appear to establish on roses or probably other smooth-leaved plants, although good numbers have been observed on cyclamen.

Montdorensis has been trialled on some commercial crops — hydroponic strawberries in NSW, chrysanthemums (both stock plants and cut flowers) in NSW and Qld, and gerbera in NSW — with promising results. The number of pesticide applications needed to control thrips has been much reduced.

### Before release

Chemical residues toxic to montdorensis must have had time to degrade before the predators are released. The synthetic pyrethroids and some organophosphates may need up to 8 weeks to break down in protected environments.

There is a range of less hazardous chemicals which are preferred if spraying is necessary. The chemical toxicity table provides a guideline for chemical use, and more detailed information can be obtained from the predator suppliers.

### At release

Introduction rates and frequency of introduction are likely to be crop-specific. Recommendations are evolving as more experience is gained. Check suppliers for current recommendations.

A suggested starting point is to release montdorensis mites weekly or fortnightly at 10 per m<sup>2</sup> until they are well established and thrips are under control. They are most effective as a preventive treatment, rather than as a cure for an already damaging pest population.

The predators are sent out in a vermiculite carrier through Express Post. They can then be easily sprinkled on the leaves to distribute them evenly through the crop. Alternatively, they can be shipped on leaves for release onto seedlings before they are placed in the greenhouse, or for use in pest hot spots.

### Cultural practices to aid montdorensis establishment

Relative humidity is critical for egg hatching, and 70% humidity is needed for a high hatch rate. In a crop with a full canopy this is not a problem. When plants are small, or conditions exceptionally dry, watering down paths or under benches, or misting, will result in better establishment.



Plate 28: Thrips damage to cucumber

## Chemical use

Many commonly used chemicals have been tested for toxicity to *montdorensis*; a list is available from predator suppliers. In some cases, pesticide residues are repellent to the predators,

minimising potentially harmful contact. Other pesticides persist for only a short time, allowing early reintroduction of predators); or they can be targeted to just a few plants, or only to flowers and buds (further minimising contact with the predators). Most fungicides are safe, but some have severe effects on egg-laying.

## Other natural enemies of thrips

Soil-dwelling predatory mites *Hypoaspis* spp., which feed on thrips pupae

Pirate bug *Orius* spp.

Parasitic wasps *Thripobius semiluteus* and *Ceranisus* spp.

Apple dimpling bugs *Campylomma liebknechti*

Predatory thrips e.g. *Haplothrips* spp.

Entomopathogens *Beauveria*, *Entomophthora* and *Verticillium*