

# Cucumeris

## Predatory mite

### Biocontrol organism

#### ☞ *Neoseiulus cucumeris*

This predatory mite has been produced commercially for many years in Europe. It is part of a large group of predatory mites called phyto-seiids, and feeds on the larval stages of thrips and some mites. This species is currently available in New Zealand but not in Australia.

Typically this mite thrives in warm, humid and semi-shaded conditions. Cucumeris eggs will hatch in 2–4 days, depending on temperature. Total development time is 8–11 days at 25°C, and the adults live for about 3 weeks.

The adult predatory mite is cream-coloured, whereas younger stages are clear.



Plate 9: Cucumeris with its egg



Plate 10: Western flower thrips on bean

are pear-shaped and fast-moving. Cucumeris eggs are clear and slightly oval and about 1.5 times the size of a twospotted mite egg. Cucumeris feeds on first and second instar thrips larvae.

### Target pests

- ☞ Greenhouse thrips *Heliethrips haemorrhoidalis*
- ☞ Onion thrips *Thrips tabaci*
- ☞ Plague thrips *Thrips imaginis*
- ☞ Western flower thrips *Frankliniella occidentalis*
- ☞ Broad mite *Polyphagotarsonemus latus*

Adult cucumeris feeds on thrips larvae, broad mite, twospotted mite and pollen, consuming

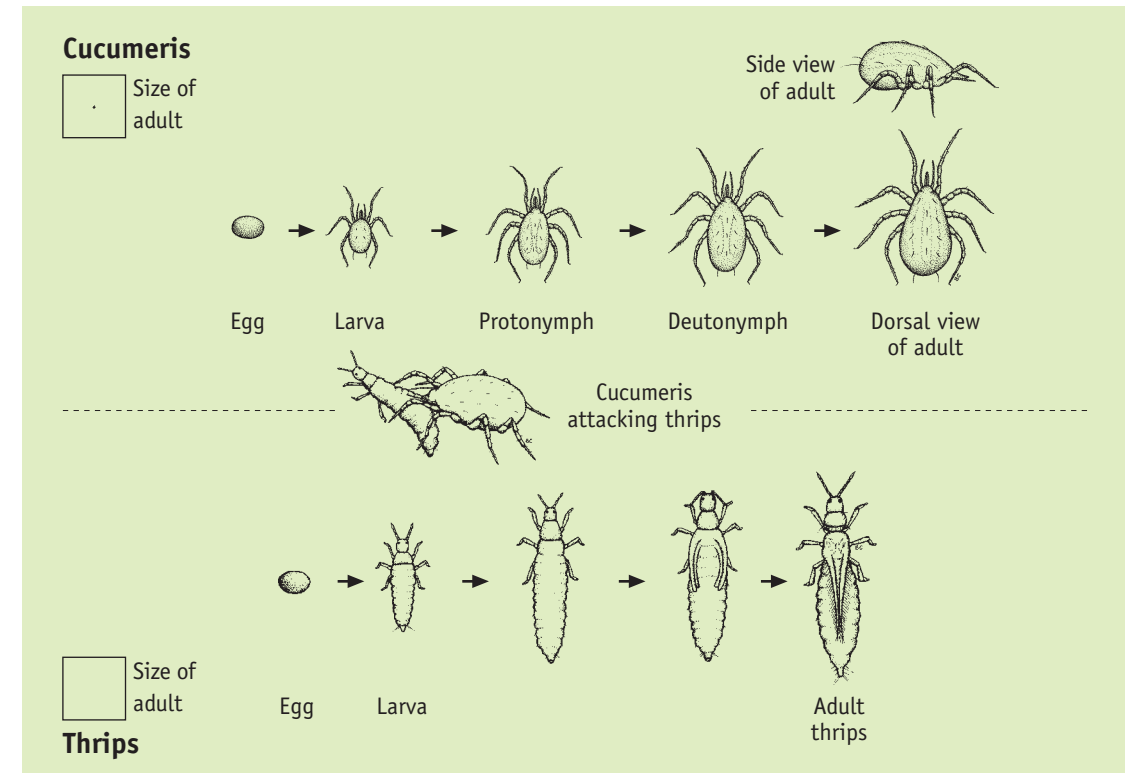


Figure 2: Life cycle of cucumeris and thrips

two to three first-instar thrips per day. Thrips are a major pest in many crops. Western flower thrips is resistant to many insecticides and, in Europe, cucumeris has been an important tool in tackling this potentially devastating problem.

Western flower thrips is best identified by a trained crop consultant. The adults are about 1.5 mm long, slightly orange in colour, with short wings (not as long as the body) and eight long, dark hairs protruding at front and back of the pronotum.

### Suitable crops/environments

Cucumeris does well in areas where the humidity is above 65%, and in crops with heavy foliage. It is used successfully in many protected

crops including tomatoes, capsicum, greenhouse vegetables, cut flowers and ornamentals.

### Before release

Chemical residues toxic to the predatory mite 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. For detailed information relating to the toxicity of chemical residues see the chemical toxicity table at the back of the book, and contact the suppliers.

Inspect crops regularly for the presence of thrips and use sticky traps and indicator plants where appropriate. Predators should be intro-

duced in the very early stages of infestation (when first seen on trap plants) or as a preventive measure in crops that invariably become infested with thrips.

## At release

Cucumeris is dispatched in sachets of bran containing over 200 predatory mites. These include cucumeris adults, nymphs and eggs, plus tiny tyrophagus mites as food for the cucumeris. The sachets are placed through the crop in a grid fashion, and the predators gradually emerge and spread through the crop. Predators continue to emerge from the sachets for up to 6 weeks. Alternatively, cucumeris may be supplied in packs of bran to be sprinkled over the crop.

## Recommended release rates

**Protected crops:** A standard rate is 500–1000 sachets of 200 predators (or 10 litres of bulk) per 1000 m<sup>2</sup>. If thrips are entering through vents or doorways these areas can be treated more heavily. Seedlings may be infested with predators



Plate 11: Cucumeris mites are released from sachets of bran which contain cucumeris plus tyrophagus mites as food for the predator.



Plate 12: Cymbidium orchid flower showing thrips damage

before they are planted out; this helps to spread the predators through the crop before overlapping foliage is present to assist this process.

Details about the best timing, release rates and method of release for various crops are best discussed with suppliers to suit specific situations.

## After release

*Neoseiulus cucumeris* aggregates on high-density patches of thrips larvae, where it feeds on young larvae and lays its eggs. The predators will disperse quickly in search of food. Release sites can be regularly inspected to assess thrips numbers as well as the establishment of the predatory mites.

Reinfestation by thrips is likely to occur, but cucumeris may still be present in small numbers and may increase to quell an outbreak of thrips. A decision can then be made whether to leave things as they stand, introduce more predatory mites or apply a chemical spray. A compatible thripicide may be necessary to reduce adult thrips numbers.

Cucumeris is best used as a preventive measure for ornamentals before any evidence of thrips occurs. The 'regular release' or 'dribble'

method is most appropriate for protected crops susceptible to thrips or in districts where thrips threatens.

## Cultural practices to aid cucumeris establishment

Plants close together or with dense foliage will automatically provide the microclimate favourable to cucumeris, because it thrives in warm and humid conditions. Plants or varieties with a more open habit or exposed to wind provide a less favourable habitat for the predators. Such areas should be checked regularly for thrips, especially during hot, dry conditions. Some misting and/or shading will improve the environment for predators during hot, dry periods.

Biological control works better on sweet pepper than on many other crops because populations of predatory mites build up by feeding on the pollen from this plant's flowers.

## Chemical use

Care should be taken with the use of chemicals. Insecticides should be avoided after releasing the predators. Fungicides (except Benlate, Morestan and Afugan) are generally of low toxicity to cucumeris. See the chemical toxicity table for more details.

If, after predators are released, the thrips population increases to damaging levels (or above a predetermined spray threshold), a compatible insecticide can be applied to reduce thrips numbers, allowing the predators to catch up and eliminate the remaining thrips. Spot spraying is preferable to blanket spraying. The least hazardous thripicide currently available is Spinosad. Soap and oil sprays, and more toxic sprays such as Maldison and Chlorpyrifos can be used with reduced impact on the predators if they are spot sprayed only.

## Additional information

Hypoaspis predatory mites feed on thrips pupae in the soil, complementing the activity of cucumeris.

## Other natural enemies of thrips

Soil-dwelling predatory mites *Hypoaspis* spp.

Native predatory mites

Minute pirate bug *Orius* spp.

Parasitic wasps *Thripobius semiluteus* (for greenhouse thrips) and *Ceranisus* spp.

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