



Stethorus punctillum

Predacious Beetle

DESCRIPTION:

Stethorus is a specialized spider mite predator in the lady beetle family. Adults are tiny, 1/10 inch (1.5mm) long, dark brown to black, oval beetles with brownish yellow antennae, mouthparts and legs. Larvae are slow moving, grey, with conspicuous legs. They move from plant to plant on leaves. Eggs are yellowish ovals, laid singly in, or near, mite colonies.

Adult beetles can fly and have an unusually good ability to find small infestations of spider mite.



Stethorus punctillum

TARGET PEST:

Two-spotted spider mite (*Tetranychus urticae*), European red mite (*Panonychus ulmi*), Spruce spider mite (*Oligonychus ununguis*), Southern red mite (*Oligonychus ilicis*)

LIFE CYCLE:

The complete life cycle takes 20-14 days at 70-80°F (21-26°C). Female beetles lay 3-13 eggs per day. Over their long life span (up to 2 years) females can lay over 1000 eggs. Females must eat 20-40 spider mites per day to initiate and sustain egg laying.

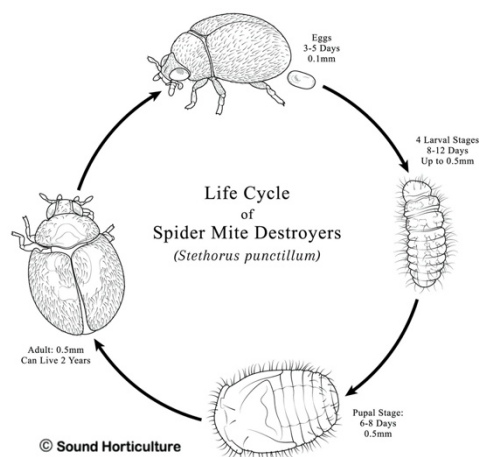
Larvae feed for 10-14 days. A single larva can consume 240 spider mites as it develops from egg to adult. Older larvae migrate down the plant to pupate and pupae are often found along leaf veins on the undersides of leaves. Adults emerge from pupae in 6-7 days.

Both larvae and adult beetles feed on all stages of mites. Adults can eat over 50 mite eggs or 10 adult mites per day. If food is scarce, they will also feed on other small arthropod eggs, aphids, nectar, and pollen, and will cannibalize their own species.

USE IN BIOLOGICAL CONTROL:

Research in Canada (Raworth 2001) has shown that *Stethorus* will become established and reproduce on spider mites in greenhouse pepper and cucumber crops. When combined with other biological controls agents, such as predatory mites, *Stethorus* can improve the management of a variety of pest mites in greenhouses, interior landscapes and nurseries.

Optimum conditions are moderate to high temperatures of 61-90°F (16-35 °C). They may remain active and feed, but won't fly at temperatures below 54°F (12°C).



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MONITORING TIPS:

Watch for small grey larvae and pupae on the undersides of leaves in areas with the earliest spider mite damage. After 4-5 weeks the first adult *Stethorus* should be found in areas with spider mites. Two months after the first introductions, all stages of *Stethorus* should be present in the oldest mite-infested areas.

PRODUCT INFORMATION:

Stethorus are sold in small containers of 100 adults. They are shipped in shredded paper or other packing material to provide protection; mortality in these containers should be less than 10%.

Once the beetles warm up they become active immediately and should be released into spider mite infested areas as soon as possible. If necessary, beetles can be stored for a few days at 50-61°F (10-16°C), but longer storage without food will reduce egg laying and adult life span.

INTRODUCTION RATES:

In commercial greenhouses, release *Stethorus* preventively or at the first sign of spider mites.

General Introduction Rate:

Release a minimum of 100 adults/"hot spot", or 10 adults/infested plant, weekly, for 3-4 weeks.

Greenhouse Cucumbers, Peppers, & Interior Plantscapes:

- Low Rate: use general rate (above) or 0.5 beetles/yard² (m²), bi-weekly, for 3 weeks.
- Moderate Rate: 100 *Stethorus*/mite "hot spot", or 1-2 beetles/yard² (m²), weekly, for 4 weeks.
- High Rate: 200 *Stethorus*/mite "hot spot", or 3-4 beetles/yard² (m²), weekly, until established in all infested areas.

FOR BEST RESULTS:

Best control of spider mites is achieved when *Stethorus* is used along with predatory mites (*P. persimilis*, *A. fallacis*).

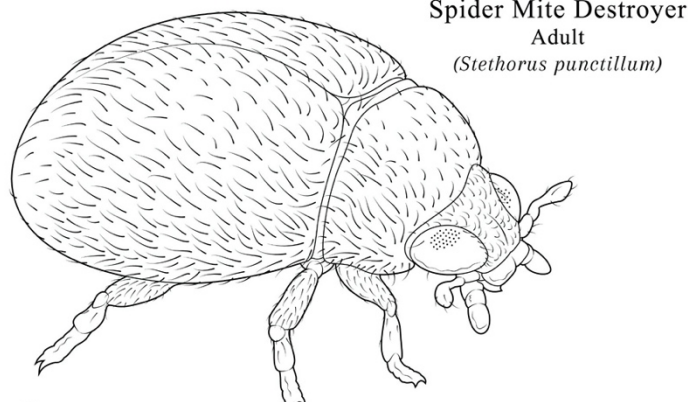
Use care when removing leaves from infested plants. Keep any leaves with *Stethorus* pupae in the greenhouse until adult beetles have emerged.

USING CHEMICALS:

The pesticide fenbutatin oxide can be used with *Stethorus* for additional control of spider mites if "hot-spots" develop. It does not harm *Stethorus*, but avoid over-spraying, which reduces the predators' food supply and their ability to reproduce.

Spreader-stickers, horticultural oils and soaps are harmful to beetles contacted by the spray, but have little residual activity.

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