Phytoseiulus persimilis
Two-spotted mite predator

ACTIVE INGREDIENT:
Phytoseiulus persimilis ...................................................................................................................... 100%

ATTENTION:

| No hazard to humans or domestic animals | No hazard to plants |
| No risk to employees or customers | No re-entry delays |
| Lethal for plant pests | Not harmful if swallowed |

TARGET PEST
Two-spotted spider mite (*Tetranychus urticae*)

DESCRIPTION
Persimilis is a tropical predatory mite that was one of the first greenhouse biological control agents available commercially. Adults are bright reddish-orange in color, with long legs and pear-shaped bodies (about 0.5mm long). Immature predators are a pale salmon color. Eggs are oval and about 0.3mm long, which is about twice the size of the spider mite eggs.

USE IN BIOLOGICAL CONTROL
Persimilis is very effective against two-spotted spider mites in greenhouse vegetables and ornamentals, interior plantscapes, and conservatories. It can also be used in warm climates on field crops such as strawberries. Optimum conditions are 68-81°F (20-27°C) and relative humidity from 60-90%.

While these are optimum conditions, they are not necessarily essential for persimilis to be successful. Please note however, that cooler or warmer temperatures may affect reproduction and development. At optimum temperatures, the predators reproduce faster than spider mites, while at warmer and cooler temperatures, the spider mites will reproduce faster.

MONITORING TIPS
Persimilis are usually easy to tell from their prey. Two-spotted spider mites are pale green, with two darker spots on their sides, and move quite slow. In winter, some two-spotted mites turn a reddish color, but can still be distinguished from persimilis by their slower movements.

LIFE CYCLE
The complete life cycle of persimilis can range depending on the temperature. At 86°F (30°C), it takes 5 days, and at 59°F (15°C), it can take 25 days. There are 4 times as many females in the population (sex ratio is 4:1 female). Females lay 2-3 eggs per day, with an average of 60 eggs over a 35 day lifetime. The eggs hatch in 2-3 days.

Newly hatched predators do not eat, but later stages and adults feed on all stages of the mites. Each predator consumes between 5-30 prey per day. Persimilis do not diapause; therefore remain active all year round in greenhouses - if the greenhouse does not freeze.

PRODUCT INFORMATION
Persimilis is sold either in a granular carrier (vermiculite or corn grit) or on bean leaves. Once spider mites are detected, it is essential to establish predators as soon as possible by introducing persimilis.

The predators should be applied the same day they are received, due to the reduction of quality when stored. If persimilis must be stored, hold only at 50-60°F; temperatures above or below cause mortality.

Vermiculite/Corn Grit
If the package arrives cold, lay the container on its side at room temperature, out of direct sunlight. Cold persimilis tend to clump together, so letting them to warm up a bit will allow them to move apart.
Check the product by sprinkling some of the carrier onto a sheet of white paper. The active predators should be easy to see.

If using for preventative measures before mites are detected, gently rotate the bottle to mix the mites with the carrier and distribute the contents over the plants evenly. If using after mites have already been detected, rotate the bottle and apply predators to each infested leaf.

**Bean Leaves**
Place leaf pieces from the container onto each infested leaf of crop plants. The bean leaves eventually dry out and become inconspicuous. Advantages of this product are that all life stages (including males and females) are present. This introduces all ages of predators into a crop and provides ideal humidity and a food supply for the predator in transit.

Although bean leaves contain a few two-spotted mites, this does not add to the pest problem (the predators will quickly eliminate them). The presence of this food enables persimilis to start reproducing immediately, which can improve the success of the biological control.

**INTRODUCTION RATES**
Persimilis is most effective when applied at the first sign of a two-spotted mite infestation. Because of its high reproduction rate, persimilis usually exhausts its food supply and eventually dies out. Therefore, repeated introductions are recommended until all sites with spider mite infestations have persimilis present.

**General Introduction Rates:** 5 persimilis per 10 ft² (m²) or 20 persimilis per infested leaf, weekly, as needed.
Apply predators to each infested plant.

**Greenhouse cucumbers:** 6 persimilis per 10 ft² (m²), or 100 persimilis per infested plant, weekly or as needed. For larger areas, use 60,000 persimilis per hectare (24,000 per acre).

**Greenhouse tomatoes:** Apply at a ratio of 1 predator for every 10-20 spider mites. The glandular hairs on tomato leaves are toxic to persimilis, so females will lay fewer eggs than on other crops. For best results, use the predators shipped on bean leaves as these are easier to apply on tomato leaves than vermiculite.

When its food source becomes scarce, persimilis disperse throughout the crop. The predator will move better within a crop when the leaves of adjacent plants are touching. It tends to move upward on plants, so it may be applied to the trunks of large plants in interior plantscapes.

When predators are found on each infested leaf, it usually means that the biological control program will be successful. It may take another 2-6 weeks for new plant growth to show improvement depending on growth rates.

**FOR BEST RESULTS**
If spider mite numbers are high (there is visible webbing and clusters of mites stringing down from leaves), use a compatible pesticide such as fenbutatin oxide or insecticidal soap before releasing predators.

Persimilis needs relative humidity greater than 60% to survive (especially in the egg stage). If humidity is too low, raise it by lightly misting plants or wetting skywalks. Where humidity is below 60%, the predatory beetle *Stethorus punctillum* can be used with persimilis.*

**Note:** Unlike *fallacis*, which can survive on pollen during times with low populations of prey, persimilis will only be sustainable on mites. If there are none to feed on, persimilis will starve to death—meaning they will not do well for preventative measures.

**Source:** Applied Bio-nomics Ltd.