

# Californicus-System

## Californicus-Breeding-System

### A spider mite killer in- and outdoors

#### PREY

Two-spotted spider mites (*Tetranychus urticae*) occur on many host plants and can cause a lot of damage. Plant cells are sucked dry, which often show as yellow dots on the upper surface of leaves. Plants get out of physiological balance and present growth inhibition. As well, aesthetic damage, caused by the creation of spider webs, can occur.

A typical morphological characteristic of two-spotted spider mites, are the two dark spots on their abdomen. Males are more mobile, smaller and thinner than the oval females. The female deposits its oval eggs, with a diameter of approximately 0,14 mm on the underside of the leaf. From the egg, a larva hatches with 3 pairs of legs. Next, the larva develops into a protonymph, followed by the deutonymph and finally, an adult stage. The different development phases are separated by a rest phase, in which the two-spotted spider mite remains for some time on the leaf with its legs drawn in. When the mite is full-grown, it still takes 0,5 to 3 days before it lays its first eggs (preoviposition period). The total life cycle strongly depends on temperature, humidity and host plant. Especially in case of warm and dry weather spider mites can reproduce very fast. In autumn, when temperature and light decrease, gravid female spider mites go into diapause. These females turn orange-red. They hide in all kinds of splits and cracks in the greenhouse, to return the next spring when the conditions improve.

#### *AMBLYSEIUS CALIFORNICUS*

*Amblyseius (Neoseiulus) californicus* occurs naturally in California, Florida and in the countries surrounding the Mediterranean on strawberries, citrus and ornamentals.

The predatory mite *Amblyseius californicus* feeds mainly on two-spotted spider mites, but also on other harmful mites, such as the fruit tree spider mite (*Panonychus ulmi*), citrus red mite (*Panonychus citri*), broad mite (*Polyphagotarsonemus latus*) and cyclamen mite (*Tarsonemus pallides*), and also on thrips and pollen.

Five different stages can be distinguished: egg, larva, protonymph, deutonymph and adult.

*A. californicus* develops well at high temperatures. This predatory mite better withstands low humidity than other predatory mites. The life cycle can be completed in 4 days at high temperatures (30°C). At the same temperature, the life cycle of spider mites is twice as long as that of *A. californicus*. The adult predatory mite lives about 20 days. She lays eggs during 14 days (with an average of 3 eggs a day). An adult *Amblyseius californicus* is able to consume 5 adult spider mites daily and possibly some extra eggs and larvae.

Especially in crops where temperature and/or relative humidity can change dramatically, *Amblyseius californicus* will do better than *Phytoseiulus persimilis*. Contrary to *Phytoseiulus*, *Amblyseius californicus* can survive longer without prey. *Amblyseius californicus* can survive on a diet of pollen.

In crops where it is hard to spot the first two-spotted spider mites, *Amblyseius californicus* can also be introduced preventively even if no spider mites have been found yet.

The nymphs of *A. californicus* prefer young stages and eggs of the two-spotted spider mite. The female eats all stages. *A. californicus* is most efficient in cases of a low population density of two-spotted spider mite.

#### FORMULATIONS AND DOSES

Biobest offers *Amblyseius californicus* in the following packages:

##### Californicus-System:

*Amblyseius californicus* is delivered per 2.000, 10.000 or 25.000 individuals, respectively in a 250 ml, 500 ml or 1 L tube mixed with a vermiculite carrier.

For preventative treatments, introduce 25 predatory mites/m<sup>2</sup> every 3 weeks.

For curative treatments, introduce 100 to 200 predatory mites/m<sup>2</sup> in the hot spots.

Californicus-Breeding-System:

The predatory mites can also be introduced into a crop by means of breeding sachets. Each breeding sachet contains at least 100 *A. californicus* in a carrier of bran and feeder mites. Californicus-Breeding-System is packed in a box of 500 sachets.

Over a period of 4-6 weeks one sachet produces more or less 1,000 predatory mites. They gradually come out of the sachet and spread throughout the crop. The sachets are perforated, so it is unnecessary to tear them open.

Affix 1 breeding sachet each 2.5 running meters. If necessary, repeat every 4-6 weeks to maintain a continuous presence of *A. californicus*.

Remark: The release of *Phytoseiulus persimilis* in hot spots is a useful addition.

## STORAGE AND STORAGE CONDITIONS

The ideal storage temperatures are:

- Californicus-System: 8°C

- Californicus-Breeding-System: 18°C

At these temperatures the respective products remain in optimal condition until the use-by date displayed on the label.

Store the product in a dark and well-ventilated place to avoid possible carbon dioxide (CO<sub>2</sub>) accumulation.

We recommend releasing the predatory mites as soon as possible after delivery.

## ADVANTAGES

1. Also attacks broad mite and cyclamen mite.
2. Can be released in both protected and open air crops.
3. Can be introduced preventively.
4. Can resist temperatures between 8°C and 35°C and low humidity.