

Identification of predatory mites and its application and conservation in field conditions

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Female predator mites produce about the same number of eggs as the prey. This phenomenon reduces the lag of predator populations behind those of the prey, and may account for the effectiveness of many mite predators in integrated pest management programs. Also, the predators respond quickly to increasing abundance of prey, resulting in the ability to rapidly increase their numbers when plant-feeding mite populations are high. Lack of available prey, however, retards predator reproduction. Injurious mites which are attacked by predator mites include twospotted spider mite, European red mite, yellow spider mite, brown mite, and others.

Identification:

Phytoseiulus persimilis: This bright orange predator is native to the tropics of South America. It does best in a humid environment of 60 to 90% relative humidity. Does best where temperatures remain below 90 degrees. *P. persimilis* is sensitive to high temperatures and low relative



humidity. A humidity of 60% or lower has a negative effect on the hatching of the eggs and the development of *P. persimilis*. If spider mite problems occur in a hot and dry environment, *P. persimilis* can reduce spider mite population to very low numbers in two to three weeks. Since *P. persimilis* are faster and stronger than their prey they easily catch and eat

them. *P. persimilis* work best from temperatures of 50 to 90°F. They then die from lack of food.

Galendromus occidentalis: *G. occidentalis* is a very versatile mite predator and tolerates high temperatures, low and high humidity (40-85%) well, both indoors and outside. Does best in warm weather (80° to 110° F). Does not do well in cool and coastal areas. It goes into diapause (hibernation) in colder temperatures.



Recommended for greenhouses only if plants are maintained as low as 40% relative humidity. This predator is well adapted for outdoor use and can perform in hot situations where humidity remains above 40%. Use of *G. occidentalis* to control spider mites, two spotted mites, Russet mites, and others on gardens, greenhouses, and orchards of all types. Adults eat 1-3 pest adults or up to 6 pest eggs/day. Release rates indoors, 2-3/sq. ft. bi-weekly, 1-2 applications; outdoors, 5,000-20,000/acre, bi-weekly, 1-2 applications.

Neoseiulus californicus: Predatory mites consume their prey one adult or a few eggs per day, they can survive longer under starvation conditions and can also live on a diet of pollen. In plants where it is very hard to detect the first spider mites, *N. Californicus* may be introduced preventatively, Completes a generation in one to two weeks depending on temperature (12 days at 64° F, 4 days at 90°

F). The female lays about 3 eggs per day for two weeks and lives about 20 days. At 77° F the female can consume 3 to 5 spider mite eggs per day. Does best in warm humid conditions, but will also tolerate low



humidity (40% - 80% RH at 50° - 105°F). they release 1 - 4 per plant or 1 - 2 per square foot in greenhouses at the first sign of spider mites. Use 10,000 per acre in field. Later releases will require much higher numbers to be effective. Releases of *N. californicus* can be made when Spider mites are present and laying eggs. *N. californicus* need a minimum of 40% humidity and ideal temperatures 60-90o F.

Release process of predatory mite : Select the predatory mite that best fits the pest management plan (e.g., target pest, greenhouse, etc.). Mites are usually shipped overnight in an insulated container with an ice pack to improve survivability. When the shipment is received it should be opened and inspected as soon as possible to determine whether the mites are still alive.

The mites are typically combined with a carrier

material, such as vermiculite, corncob dust, or sawdust. A light spray of water on the application area will help the mites and carrier material stay in place when they are applied to the infested area. It is best to apply them to the field, garden, or greenhouse as soon as possible to ensure their survival. To avoid extreme heat or cold that can decrease predator success, apply them in the early morning or late evening.

Depending on the predatory species and the pest mite population level, recommendations are for a release of 2000 – 5000 predators per acre. If there are noted “hot spots” of pests it is good to make sure the predators are applied in those areas to help get those hot spots under control.

Predator releases are more successful if early scouting has detected pests before the population gets too high. Begin in spring and check plants weekly for pest and predatory mites. This will require at least a hand lens and a lot of practice.

Conservation: Conservation involves practices that encourage native predatory mite populations. Many

pesticides are just as, or more, harmful to predatory mites as they are to pest insects and mites. In fact, some pesticides, such as imidacloprid, carbaryl, and malathion, actually promote spider mite growth and/or reproduction while reducing the resident predatory mite population. Often, secondary outbreaks of pest mites result from the mortality of predatory mites following broad-spectrum pesticide applications for control of primary pests. Predatory mites can be conserved by eliminating or reducing pesticides that are toxic to arthropod predators. Predatory mite adults become active in the spring before the spider mite population emerges. Predators are most likely to become established in perennial flowers, shrubs and trees. The pollen, small insects and cool-season pest mites in a perennial planting will help maintain a population that is ready to go to work when the pest populations begin to increase. These perennial plantings would be most effective as a border crop or as intercropped strips within the crop area. A diverse habitat of plants will help maintain a healthy beneficial mite population.

Received : 07.11.2012

Revised : 21.04.2013

Accepted : 22.05.2013

RNI No. : UPENG/2010/32274 ONLINE ISSN : 2230 - 9438 ISSN : 0976 - 125X

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Internationally Refereed Research Journal of the H.I.C.B.M.:

RNI : UPBIL/2008/24399

ONLINE ISSN : 0976-7940

ISSN : 0974-2646

INTERNATIONAL JOURNAL OF COMMERCE AND BUSINESS MANAGEMENT

Accredited By NAAS : NAAS Rating : 3.5

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