European Journal of Agricultural and Rural Education (EJARE)
Available Online at: https://www.scholarzest.com
Vol. 2 No. 4, April 2021,
ISSN: 2660-5643

SPIDER MITE ACARIFAGES

Rano Dalabaevna Muminova
(Tashkent State Agrarian University, Uzbekistan)

Article history:

Received March 30th 2021
Accepted: April 7th 2021
Published: April 30th 2021

Abstract:

Recently, an expansion of the range of plants grown in greenhouses has been noted throughout the world. In addition to traditional vegetable crops (cucumber, tomato, sweet pepper), early potatoes and cabbage, eggplants, green crops, strawberries, melons, as well as many types of floral and ornamental plants are cultivated. Optimal conditions for growing plants in greenhouses are also favorable for the reproduction of pests. The complex of phytophages that damage vegetable and ornamental crops includes mainly polyphagous species, but there are also specialized pests.

The spider mites, greenhouse whiteflies, tobacco and other species of thrips, various types of aphids - melon, peach, potato, etc. are especially harmful in greenhouses. The nightshade miner, which damages mainly tomatoes, has recently acquired important economic importance.

To regulate the number of harmful phytophages in greenhouses, it is effective to use entomo and acariphages, the species composition of which is quite wide. For many species, regulations have been developed for their development and use on various crops grown in greenhouses.

Keywords: Phytoseiulus, Amblyseius, phytophages, greenhouses, acariphages, polyphagous, diapauses.

Phytoseiulus - Phytoseiulus persimilis Ath.-H. (family Phytoseiidae, order Parasitiformes). It is a highly specialized predator that feeds on spider mites. Phytoseiulus is a tropical species by origin; therefore, diapause is absent in its development cycle. The tick was brought to our country in 1963 from the Netherlands by Professor G.A. Beglyarov. Currently, this acariphage is widely used in protected ground.

Optimal conditions for the development of acariphagus are temperature 25 ... 26°C, relative air humidity not lower than 70%. The developmental cycle of a predator includes the phases of the egg, larva, nymphs of the 1st and 2nd instars, and the adult tick.

The egg is oval (0.21 x 0.18 mm), with a pinkish tinge, almost twice the size of a spider mite egg. The larva is 0.17 ... 0.2 mm long, six-legged, yellowish-orange in color. Nymphs of 1st, 2nd ages and adult ticks with four pairs of legs. An adult female phytoseiulus up to 0.5 mm long, pear-shaped, with thin elastic body integuments. The color varies from orange-red to cherry (color insert, Fig. 1). The male is slightly smaller than the female.

A distinctive feature of phytoseiulus is its high voracity. Under optimal conditions, one female can kill up to 24 mobile spider mites or 30 eggs during the day. Adults of the predator feed mainly on the adults or nymphs of the spider mite. The larvae and nymphs of the acariphage destroy the eggs and larvae of the pest. Having finished with the pest on some leaves, adults of phytoseiulus migrate to other plant leaves infected with spider mites.

Phytoseiulus is a highly specialized acariphage, therefore, it cannot persist for a long time on plants free of spider mites, and dies in their absence after 3 ... 4 days. This circumstance requires the constant maintenance of the phytoseiulus population for release into newly emerging pest foci.

The use of phytoseiulus. In protected ground phytoseiulus is used in various ways: local and massive releases, the "pest in first" method. The phytoseiulus production rate largely depends on the density of the spider mite population, the type of plant, and hygrothermal conditions. On average, the annual rate of phytoseiulus colonization in greenhouses on cucumbers is 0.5 ... 1 million individuals per hectare.

When the first foci of the pest appear, the leaves of soybeans or another crop, on which the predator has been accumulated, are laid out in the foci of the tick at the rate of 10 ... 60 individuals of the predator per infected plant. When releasing the pest in the pest, it is necessary to observe the ratio of predator: prey - 1: 20 ... 1: 50, depending on the protected crop.

In addition to phytoseiulus, spider mites can also destroy other predatory mites - amblyseius (Amblyseius cucumeris Oud., A. Californicus McGregor, A. Mckenziei Sch. Et Pr.), Western metaseiulus (Metaseiulus occidentalis Nes.)

Amblyseius mckenziei Sch. et Pr., - belonging to the order of parasitiforms, the phytoseiid family, is a predatory mite. It feeds on both different types of ticks and small insects, mainly thrips, against which it is increasingly used indoors. An important feature in the use of amblyseus against tobacco thrips is its adaptability to

high temperatures. Temperature zones of optimal development of tobacco thrips and amblyseius coincide and are in the range of +25 ... + 30 ° C. Under these conditions, the daily gluttony of amblyseus is 5 - 8 thrips larvae, which is more than twice the fertility of the pest. The most economical way of using a predator is its one-time release on plants during the initial period of thrips breeding. With a high number of pests, it is possible to use amblyseus by the method of flooding releases.

The use of amblyiseus. Successful plant protection with the use of amblyseius requires prompt signaling of the timing of the appearance of the pest, as well as accurate accounting of the number of damaged plants and the number of thrips on them. This is due to the fact that the predator has a low functional response to the density of the pest, as well as a low rate of dispersal and search ability. In this regard, the controlling effect of the use of amblyseius depends on the place and density of the introduction of the predator in the greenhouse, i.e., the colonization of the predator must be carried out in the immediate vicinity of the breeding center of the pest, maintaining a high ratio of predator: prey (from 1: 1 to 5: 1). The predatory mite is colonized together with the substrate (bran) on which it was bred. The required amount of bran is poured onto the soil under the stem of the plant or suspended in a polyethylene tetra pack (filled with bran with a predator) on the leaf petiole in the immediate vicinity of the breeding center of the pest.

Phytoseiulus persimilis Ath. - H., - belonging to the order of parasitiforms, the phytoseiid family, - predatory mite. One of the most widely used species for biological control of spider mites on vegetable and ornamental crops in greenhouses. It multiplies rapidly, the period of development from egg to sexually mature individual is 6 - 10 days. The most voracious females, they prefer to feed on adult spider mites, which are destroyed by more than 20 individuals per day, while laying from 2 to 6 eggs. Usually, having destroyed large mites - phytophages, females of phytoseiulus move to neighboring leaves and plants. The female of the predatory mite lives - 18 - 25 days. From the eggs laid by the females of phytoseiulus, small fast-footed larvae emerge, which eat up the remains of the spider mite colony, molt several times and turn into adult females and males. The peculiarities of nutrition and reproduction of phytoseiulus lead to the rapid destruction of the bulk of the pest, their action can be compared with the action of chemical acaricides. The predator is especially effective at high air humidity and moderate temperatures.

The use of phytoseiulus. The long-term practice of using phytoseiulus in various types of cultivation premises has shown the advisability of using two methods of colonization of a predator: focal and mass. Their choice is determined by various factors, including the number of detected breeding centers of the pest and the degree of damage to plants, the presence of a sufficient amount of biomaterial and the qualifications of workers involved in the examination and use of the predator. A weekly or ten-day survey of plants, which should be organized from the moment of growing seedlings, guarantees the timely identification of foci with a pest and the effect of the use of phytoseiulus. The predator is released on damaged plants based on an eye estimate of the degree of infestation (weak, medium, strong). With a weak population of spider mites, the release rate is 10 ... 20 individuals per plant, with an average - 30 ... 50. If the population is strong, then the number of released predators should provide a ratio in the outbreak of 1: 10 ... 1: 20.

REFERENCES:

1. McMurtry J.A. The use of Phytoseiids for Biological Control // Proc. Formal Conf. Acarol. Soc. Am. held at the Entomol. Soc. Am. Meeting (San Diego, Dec., 1981). — San Diego: Univ. California Press, 1982. — P. 23-48.
2. Акимов И.А., Колодочка Л.А. Хищные клещи в закрытом грунте. — Киев: Наук. думка, 1991. — 144 с.
3. Бегляров Г.А. Методические указания по массовому разведению и применению хищного клеща фитосейулюса для борьбы с паутинным клещом в защищённом грунте на огурцах // М., Колос, 1976, с. 1-25.
4. Чалков А.А. Особенности применения и эффективность фитосейулюса в борьбе с паутинным клещом в весенних плёночных теплицах в Ленинградской области. Автореферат кандидатской диссертации // Л.-Пушкин, 1971.
5. Бегляров Г.А., Малов Н.А. О возможности использования хищного клеща фитосейулюса (Phytoseiulus persimilis A. H.) для борьбы с паутинным клещом на различных растениях. Тезисы докладов II акарологического совещания. Наукова думка, Киев, 1970, ч. 1, с. 5.
6. Murodov B.E., Yakhyoyev J.N. Quarantine pests of internal quarantine of the republic of Uzbekistan // Education and science in Russia and abroad. – 2017. – P. 32-36.