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GREENHOUSE WHITEFLY

[1] ARMAN HRANTOVICH BABAYAN

ABSTRACT-- *In this article we will consider such a well-known pest as the greenhouse whitefly. The danger to plants from this pest is due not only to the fact that the insect damages the leaves. Whitefly can be a carrier of many pathogenic phytoviruses. That is why it is necessary to deal with the pest at the first sign of plant damage, as well as timely preventive measures to protect plants.*

Key words-- *greenhouse whitefly, pest, crops, insect, infection, control methods.*

I. INTRODUCTION

Greenhouse whitefly is a well-known pest for eggplant, tomatoes, sweet pepper, cucumbers and other vegetables bedding in closed ground. The insect is not averse to "feasting" on flowers and ornamental plants. No wonder the second name of the whitefly is the greenhouse. Whitefly has a tropical origin - Brazil and Mexico are considered the birthplace of the insect. Now the insect is spread everywhere. It is transported most often together with populated plants, less often - due to independent migrations of insects. Damaged crops:

1. In the greenhouse: cucumber, tomato, watermelon, melon, pepper, parsley, celery, salad.

2. In greenhouses and under indoor conditions, whiteflies can harm ornamental plants: chrysanthemums, roses, azaleas, hibiscus, lemon, orange, tangerine, strawberries.

3. In laboratory conditions, whitefly can eat and breed on soy, tobacco, shag .

II. Insect biology

The life cycle of an insect includes four periods: imago (adult), egg, larva, pupa. Females usually lay eggs on the leaves of plants. Larvae of the first age (strollers) hatch from eggs in a week and begin to move. After several days having passed, in the next larval stages of development, the insect remains motionless, and in appearance resembles a scale. Larva of the last age - the pupa stops feeding. At a temperature of 21°C, it takes about a month to reach the adult stage. Then, an imago - an adult whitefly - flies out through the formed T-shaped gap. They usually make short flights, but can travel long distances through the wind.

An adult whitefly resembles an ordinary moth

[1] *ARMENIAN NATIONAL AGRARIAN UNIVERSITY REPUBLIC OF ARMENIA, YEREVAN, TERYANA 74*

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III. Nature of damage

Whiteflies are sucking insects, both in the adult stage and in the larval stage. Typical symptoms of damage are the presence of honey dew on the surface of leaves and/or fruits. Sooty fungi can develop on honey dew, which inhibit photosynthesis and can make the fruits unsightly. A strong degree of infection reduces the overall power of the plant, leads to stunted growth and low yields. This pest can carry viruses: a mosaic of tomato, cucumber, X-virus of potatoes and others.

Greenhouse whitefly: why the pest is dangerous for the crop and how to deal with it.

Gluttonous whitefly larvae feed on the sap of plants and cause them great harm. Damage to the white whitefly is easily confused with damage caused by other sucking insects. The presence of a pest can only be determined with constant monitoring.

Table: whitefly life cycle and pest detection methods

Development stage	What it looks like	Where to discover
Imago	1.5 mm, at rest the wings fold almost in one plane, covered with a white waxy coating	On the underside of the leaves
Egg	0.25 mm long, yellowish white, after 2 days it turns gray with a violet hue, conical in shape, on a short stalk	On the underside of leaves, often in the shape of a (semi) ring
Larva	Small, usually pale green, oval, flattened, similar to scales	On the underside of the leaves
Chrysalis	0.8 mm in length, whitish, oval, located along the edge	On the underside of the leaves

In the greenhouse, whitefly prefers cucumber. Fertility of the insect, the rate of reproduction is much higher than on other crops. The fact is that for the cultivation of cucumber, high humidity is maintained, and under such conditions, leaf contamination with sooty mushrooms occurs faster and more intensively.

Whitefly control measures in the greenhouse

1. To prevent the pest from settling, it is enough to take simple preventive and non-chemical control measures:

2. Prevention of planting of infected plants. Buy seedlings only in trusted locations.

3. The use of appropriate insect nets will prevent adults from entering the greenhouse during the summer.

4. Removing diseased plants in and around the greenhouse.

5. The use of glue traps.

6. The use of biological enemies of whiteflies, such as carnivorous wasp riders (Encarsia formosa, Eretmocerus eremicus), predatory bugs (for example Macrolophus pygmaeus or Nesidiocoris tenuis), beetles (Delphastus catalinae), ticks (Amblydromalus limonicus, Amblyirskumus limonicus).

IV. Chemical methods of control

If you decide to deal with the pest with special chemicals, we will tell you about the following rules:

1. After one spraying with chemical preparations, only the susceptible stages that are present at the time of treatment or during the period of time when the chemical substance remains active will die. At all other stages of development, the pest will survive and continue to develop. Thus, during the period of growing a crop, it may be necessary to carry out repeated treatments with an interval of several days.

2. Many insecticides are available to combat the greenhouse whitefly, but whitefly races resistant to a particular drug have already appeared. Therefore, strategies to prevent the development of resistance should be applied to maintain the effectiveness of insecticides.

3. It is important to choose insecticides and methods of their application that are not harmful to biological control agents.

4. Always follow the instructions for use: do not change the dosage, observe precautions when working with insecticides

For chemical processing tomato, cucumber and other vegetables use the following preparations:

- Fitoverm,
- Citcor,
- Fosbezid,
- Confidor,
- Actellik,
- Aktara,

- Vertimek,
- Pegasus.

For decorative plants it is recommended to use:

- Biotlin,
- Colorlux Bau,
- Novaktion,
- Inta Tz-M.

V. Traditional Remedies вето

If the use of chemicals is unacceptable, use proven folk methods of pest control. Prepare the following products and treat them with plantsвето:

1. Sugar solution. Dissolve 2 tbsp. sugar in 1 cup of water and treat leaves that have signs of whitefly damage. If it doesn't help, repeat spraying with solution after a weeko.

2. The infusion of garlic. Grind 15 g cloves of garlic and pour 100 ml of water. Cover and leave for 5 days. The infusion will be very concentrated, therefore, for plants treatment, it is enough to dilute 5–6 g of the infusion in 1 liter of water вето.

3. Infusion of yarrow. Finely chop the yarrow grass (80 g), scalp with boiling water, pour 1 liter of water and leave for 24 hours. Treat diseased plants: if the leaves are large, wipe with a cotton swab dipped in infusion, and for plants with small leaves, spraying will be more effectiveвето.

VI. Fumigators вето

These are special devices designed to deal with annoying mosquitoes and flies. A capsule is charged into the apparatus; a plate impregnated with a repellent emulsion is included in the network.

The only difficulty is to run an electric extension cable to the greenhouse. Close the air vents, doors, ventilators tightly, and then turn on the device. A few hours of work is enough to kill all the whiteflies inside. However, beneficial insects that inhabit the greenhouse will die with them.

VII. Herbal infusions

Consider an effective "grandfather" recipe for yarrow:

1. Collect the plant during flowering, dry, grind the dry mass.
2. Fill grass with a ¼ 10-liter bucket. Add the remaining volume with water.
3. Close the lid, leave in a warm place for 2-3 days.
4. Strain the liquid, treat it with plantings from the sprayer.
5. For prevention, repeat treatment every 1-2 weeks.

The second effective infusion is garlic. It also has a bactericidal effect - it helps to neutralize fungal pathogens that multiply in the sticky waste of whiteflies:

1. Interpret, chop the garlic heads - you should get 1 cup of aromatic mass.

2. Pour garlic in 10 l of heated water.

3. Infuse the mass for 2 days, strain when ready.

4. Process from a spray, sprayer each sheet of the affected plant on both sides.

5. Repeat treatment after 4-5 days until the pest is completely destroyed..

Another effective infusion is from dandelion:

1. Grind 50 g of rhizomes and 50 g of green mass (without flowers) of the plant.

2. Pour 1 liter of water.

3. Let it brew for 2 days.

4. Strain, spray the plants with dandelion solution.

5. After 2 weeks, repeat treatment вето.

It is also effective to dust the affected plants with tobacco dust, and prepare liquid solutions on its basis.

VIII. Sticky traps

Another flies remedy that helps eliminate whiteflies effectively . A little secret: buy yellow adhesive tapes - it attracts pests more than others. It’s possible to make such a trap yourself: cut cardboard or yellow plywood into pieces, ribbons, paint them with yellow gouache, felt-tip pen.

Then cover the surface on both sides with a sticky substance - honey, sugar syrup, jam, jam, petroleum jelly, rosin. You can use special glue from rodents. Make holes in each of the traps, pass a twine or string through them. Tie to supports over plants, structures on the roof of the greenhouse.

In the future, it remains only to remove traps with adhering pests, replace them with new ones or simply clean them off, and renew the adhesive layer. Whiteflies better stick to the tape provided periodically shakeing the greenhouse plants - disturbed insects will look for a new place of dislocation, rush to the calling yellow color.

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