MONITORING CICADA - HEPPER PEST IN FERGANA VALLEY, THEIR NATURAL ENEMIES AND MODERN RECOMMENDED MEASURES TO COMBAT THEM

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Abstract: Theses present materials on the study of cicada cotton fields in the Ferghana Valley, their species composition, the most harmful species, their nutritional relationships, biological features, harmfulness, development phase features, wintering phases of pests, their natural enemies, and recommended modern control measures them.

Keywords: Pests, cicadas, cultivated plants, cotton, Empoasca meridiana Zachv., Kyboasca bipunctata Osh., Austroagallia zachvatkini Vilb., Cicadatra querula (Pall.), Cicadatra ochreata (Mel.), Value, biology, harmfulness, food developmental phases, wintering phases, insecticides, modern methods, plant protection.

Introduction

In the Palearctic, scientists identified 4082 species of cicadas belonging to 718 genera and 20 families [1]. According to our observations [2], 236 species of cicadas are found in the Ferghana Valley. They are widely represented in a variety of settings.

We study the species composition of cicadas, identify the most harmful species, conduct a systematic analysis of their harmfulness, study bioecological features, natural enemies, improve methods for regulating their numbers, and develop practical recommendations for production.

In Uzbekistan, cotton is damaged by Empoasca meridiana Zachv., Kyboasca bipunctata Osh., Austroagallia zachvatkini Vilb. [3, 2] and two types of song cicadas Cicadatra ochreata (Mel.) And Cicadatra querula (Pall.) [4].

According to V.V. Yakhontov [4], the singing cicada C. ochreata - “cotton cicada” can be ranked as a serious pest of cotton.

We noted damage to this cicada of cotton, sesame seeds, potatoes, mulberries, pears, poplars, vines and other crops.

Studies have shown that of the above species, three species: Empoasca meridiana Zachv., Kyboasca bipunctata Osh., Austroagallia zachvatkini Vilb., Are common and the most harmful polyphages.

E. meridiana harms cotton, alfalfa, clover, beans, mung bean, beets, potatoes, carrots, bell peppers, eggplant, zucchini, watermelons, melons, tomatoes, radishes, turnips and other agricultural plants.

K. bipunctata prefers licorice, from where it goes to cultivated plants and damages them. In the Ferghana Valley, we noted K. bipunctata nutrition on cotton, alfalfa, beans, beets, carrots, and potatoes.

A. zachvatkini, besides cotton, feeds on alfalfa, beans, beets, eggplant, cabbage and other agricultural plants.

E. meridiana in our conditions sucks plant juices on the underside of cotton leaves, on the upper side as a result of nutrition light roundish spots are formed, the leaves become finely white-spotted, the assimilation surface of the leaves is sharply reduced. When fed, cicadas produce punctures anywhere, but, in general, there is a preference for the peripheral part of the leaf and a gradual advance of the cicadas to the center, especially along the veins. As they grow, the cicadas leave the damaged leaves and move to younger, blooming leaves. After each puncture, light spots are formed about 1 mm across. With severe damage to the

leaf, the whole is dotted with light spots and becomes whitish, the upper side of the leaves becomes a marble look.

We found that noticeable changes in the chemical composition occur in the leaf blades of plants on which the cicadas feed: the quantity and quality of protein fractions change, the amino acid composition and the content of carbohydrate fractions change. The amount of protein in the leaves decreases in proportion to the degree of damage by the cicadas. The protein content in chlorotic leaves was reduced compared to control leaves to 33%, and in brown leaves to 70%. The reason for these changes is apparently associated with a violation of protein metabolism as a result of nutrition of E. meridiana.

Winters E. meridiana in the adult phase, i.e. an adult insect, usually in dried vegetation, along ditches, on mulberry plantations, in gardens under fallen leaves and other protected places. In early spring, depending on weather conditions, spring appears on alfalfa and feeds on growing alfalfa. It can be found in wintering places on a variety of growing vegetation. With the advent of seedlings, E. meridiana passes to cultivated land and feeds on cultivated plants, including cotton. Larvae and adult cicadas have damaged cotton since germination. The number of cicadas on cotton gradually increases during the growing season. According to our observations, the largest number of them appears in late May, in June and September.

We studied the peculiarities of biology and harmfulness of K. bipunctata, it was established in what phase the pest overwinters in the Ferghana Valley.

K. bipunctata eats on the underside of the cotton leaf, and light spots form on the upper side. The damage caused by it can be distinguished, since the K. bipunctata circus begins to feed in any part of the leaf, while the body can be oriented in any direction. Having pierced the epidermis and sucked out the contents of the cell, it moves back a little and makes a second pricking. So she does, 3-8 stabs in a row, and sometimes more, as a result, a light zigzag strip of different lengths is obtained. Then the circus moves to a new site. One adult cicadka or an older larva in 7-8 days of feeding on a sheet of cotton discolours it almost completely.

There is no consensus in literature on wintering issues of K. bipunctata. To clarify the wintering phase and study the wintering conditions, we performed an autopsy of the females, which showed that the formation of eggs in the ovaries of the female K. bipunctata, in 2019, in Andijan region began in the second half of September. Oviposition began in the first ten days of October and continued throughout the month. The number of eggs in females decreased during October. At the beginning of November, single females met, in the ovaries of which 1-2 eggs were contained. Observations showed that in mid-November, the cicadas began to die out and by the end of the month they died out completely. A similar pattern was observed in the autumn of the previous year, with the only difference being that the oviposition of the cicadas ended in early November, and the cicadas died out by the end of the second decade of November. Based on the data obtained, it can be considered that this circadian under our conditions hibernates in the egg phase. In addition, our research data shows that it damages cotton and develops in the Ferghana Valley in 5 generations.

A. zachvatkini is a white circadian, differs from the green cicadas of E. meridiana and K. bipunctata in appearance, proportions and body color. It is larger than the previous ones, the size of the male is 3.4-3.6 mm, the female is 3.7-3.9 mm. It is easily distinguished from other species by four rounded black spots, two of which are located on the crown of the head, and the other two are located at the posterior margin of the pronotum opposite the first two.

We believe that A. zachvatkini overwinter eggs. This is evidenced by the following facts: in the autumn in the third decade of October or the first decade of November, the cicadka disappears from the fields and in the winter period no adult cicadas were found. No imago was found in soil samples and during the

examination of various sites adjacent to the cotton fields. In spring, adults appear relatively late. In the conditions of the Ferghana Valley, we traced 3 generations of white cicadas. The periods of development of the larvae are well demarcated. Larvae of the third generation hatch in the first decade of August and were found in nature until September 10-15. Their development lasted 40-45 days. The cicadas of the last third generation died out in mid-November.

On the cotton fields of the Ferghana Valley, a total of 71 species of cicadas are found, of which 52 species are related by their nutrition to various crops. Cotton crops damage 3 types of cicadellides: Empoasca meridiana Zachv., Kyboasca bipunctata Osh. and Austroagallia zachvatkini Vilb.

In addition, a study of the food ties found in the cotton fields of cicadas showed that of the species found in the cotton fields, alfalfa live and eat alfalfa: Brachyprosopa bicornis, Scorlupaster asiaticus, Tettigometra varia, T. vitellina, Hyalesthes obsoletus, Reptalus rufoc pallens, Dictyophara europae, D.longirostris, Ribautodelphax zeravshanicus, Toya propingua, Laodelphax striatellus, Asiraca clavicornis, Euscelidius mundus, Euscelis lineolatus, Phlepsius intricatus and others.

To conduct biological control of harmful species, we studied predators and parasites of cicadas. To ensure the effectiveness of protective measures, we recommend the use of natural populations of natural entomophages.

We noted parasites from the families Trombididae, Dorylidae, Dryinidae. The most effective parasites are hymenoptera from the Dryinidae family, infection with other parasites in the years of research ranged from 1 to 2%. Dryinids are recommended by us as an object of research for their use in the biological method of combating cotton damaging cicadas. The percentage of Hymenoptera infection from the Dryinidae family varies from year to year from 15 to 18%. Infected cicadas wintering in the adult phase usually die in the winter months. Fertility of infected cicadas laying wintering eggs in autumn is reduced by 70%.

The results of the study of predatory species showed that in the Ferghana Valley, cicadas are destroyed by arachnids (spiders, saltpugs) and insects: mantis (Mantis religiosa), bugs (Nabis pallifer, N. ferus, Orius niger, etc.), beetles (Coccinella septempunctata, Adonia variegate et al.), Laceworm larvae (Chrisopa perla, Ch. Carnea, Ch. Vittata, etc.). The study and breeding of parasites and predators of cicadas makes it possible to use them in the biological control of cicadas that damage cotton.

If it is necessary to carry out modern, gentle chemical control measures, we rely on the “List of chemical and biological agents for controlling pests, plant diseases and weeds, defoliants and plant growth regulators allowed for use in agriculture of the Republic of Uzbekistan” and treatment against cicadas should be carried out recommended insecticides used against these pests, given the number of cicadas per unit of account, when the economic threshold of harmfulness is exceeded.

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