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PESTS ON TOMATOES PRODUCED IN GREENHOUSES IN STRUMICA REGION

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Abstract: Tomato (*Lycopersicum esculentum*) is one of the most important cultures grown in greenhouses in Strumica region. Therefore, studying the pests that damage tomatoes is very important. The aim of this examination was to determine the pests on tomato grown in greenhouses during 2007 and 2008 in Strumica region. More pests were determined during the examination: *Myzus persicae*, *Aphis gossypii*, *Trialeurodes vaporariorum*, *Thrips tabaci*, *Frankliniella occidentalis*, *Aculops lycopersici*, *Tetranychus urticae*, *Liriomyza bryoniae*, *Helicoverpa armigera*.

Key words: pests, tomatoes, *Myzus persicae*, *Aphis gossypii*, *Trialeurodes vaporariorum*, *Thrips tabaci*, *Frankliniella occidentalis*, *Aculops lycopersici*, *Tetranychus urticae*, *Liriomyza bryoniae*, *Helicoverpa armigera*

D. SPASOV, DR. SPASOVA, M. GEORGIEVSKI, B. ATANASOVA, University „Goce Delcev“ — Stip, Faculty of agriculture, Goce Delcev b.b. 2400 Strumica, R. Macedonia. ВРЕДИТЕЛИ ПО ДОМАТИТЕ, ПРОИЗВЕЖДАНИ В РАЙОНА НА СТРУМИЦА, МАКЕДОНИЈА

Резюме: Доматът (*Lycopersicum esculentum*) е една от най-важните култури, отглеждани в парници в района на Струмица. Затова, изследванията на вредителите, които повреждат домата са много важни. Целта на това изследване бе да се определят вредителите по доматите, отглеждани в парници в района на Струмица за периода 2007—2008 г. Определени са следните вредители: *Myzus persicae*, *Aphis gossypii*, *Trialeurodes vaporariorum*, *Thrips tabaci*, *Frankliniella occidentalis*, *Aculops lycopersici*, *Tetranychus urticae*, *Liriomyza bryoniae*, *Helicoverpa armigera*.

Ключови думи: вредители, домати, *Myzus persicae*, *Aphis gossypii*, *Trialeurodes vaporariorum*, *Thrips tabaci*, *Frankliniella occidentalis*, *Aculops lycopersici*, *Tetranychus urticae*, *Liriomyza bryoniae*, *Helicoverpa armigera*

Tomatoes are one of the economically more important cultures grown in Macedonia, especially in Strumica region. Because of its quality characteristics it is one of the most appreciated and the most spread vegetable crops.

The areas planted with tomatoes vary from year to year, depending of more factors.

In Strumica region it is grown in greenhouses in the period from January to November. The most maintained varieties — hybrids that are grown are: Magnus, Bele, Balet, Melodija, Njutn, Astraion, Alambra etc. Although these are high yield varieties, yet, the expected results are not achieved. The most important factors that effect on the low yield are the pest insects.

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MATERIAL AND METHODS

This work is result of the activities of the Cathedra for Plant protection on Faculty of Agriculture, University Goce Delcev, Stip.

During the examinations, control of all important localities in Strumica region is made, where from plant examples, attacked with different pests, were taken. Visual controls on every ten days were made on the plants, as well on the weeds in and around the parcels with tomatoes. The collected material from the field was taken in the laboratory where determination of the species was made.

Localities of examination. The examinations were made at three localities in Strumica region: 1. s.

Piperevo, north-east from Strumica, where the area of the greenhouse was 0,2 ha, and the tomatoes were variety Bele; 2. s. Kuklis — near Stumica, where the area of the greenhouse was 0,1 ha, and the tomatoes were variety Njutn; 3. s. Borievo, south-east from Strumica where the area of the greenhouse was 0,3 ha, and the tomatoes were variety Graciela in 2007, and Alambra in 2008.

Weeds on the examined areas. The analyses of the weeds in the three localities did not show difference in the species. The most represented weeds were: *Galinsoga parviflora* Cov., *Chenopodium album* L., *Amaranthus retroflexus* L. and *Echinochloa crus gali* L. The most important weeds around the parcels were *Convolvulus arvensis* L., *Polygonum convolvulus* L. and *Digitaria sanguinalis* L.

RESULTS AND DISCUSSION

The following pests were noticed:

Leaf aphids — *Aphididae*. On the examined localities the leaf aphids were usually present, but as a characteristic, it could be said that their number and intensity of attack was not particularly expressed in all localities. Stronger attack with making colonies on the plants, leaf aphids showed at the end of August till the end of September in 2007, and in May and June in 2008. In single forms the leaf aphids were noticed in

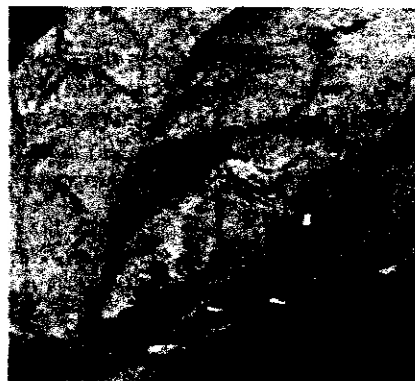


Fig. 1. Leaf aphids on tomato

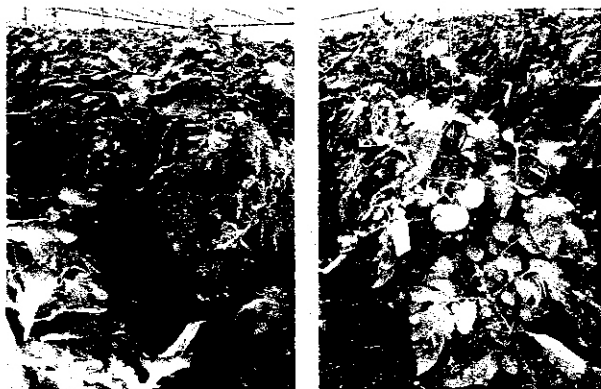


Fig. 2. Damages caused by whitefly



Fig. 3. Damages caused by mites



Fig. 4. Damages caused by leaf miner



Fig. 5. Damages caused by *Helicoverpa armigera*

all localities during the vegetation of the tomato plants. The most represent species in this region are *Myzispersicae* Sulz and *Aphis gossypii* Glov.

Whitefly — *Trialeurodes vaporariorum*. The whitefly (*Trialeurodes vaporariorum*), as pest on tomatoes, appears with high intensity especially on tomatoes as second culture. The tomatoes were attacked around 15 July, when the outside temperature grew. The intensity of the attack kept until half of November.

Thrips — *Thripidae*. The thrips (*Thrips tabaci* and *Frankliniella occidentalis*) in 2003 were noticed on tomatoes in this region. From year to year thrips are more important as tomatoes pests. The first appearance of the thrips is noticed early in spring, and with small oscillations the moderate intensity kept through all vegetation of tomatoes.

Mites — *Aculops lycopersici* and *Tetranychus urticae*. As tomato pests the mites were noticed particularly on tomatoes grown as second culture. On some localities in July were noticed with higher intensity, and they had to be treated with pesticides, to inhibit making them more damages.

Leaf miner — *Liriomyza bryoniae*. The leaf miner (*Liriomyza bryoniae*) also made big damages. In some localities to 20% of the leaf surface was mined, but mainly in the older growing stages of tomato, on the older leaves, so the damages were not that serious, because the older plants easily accept the attack.

Moths — *Noctuidae*. The biggest damages on tomatoes caused the cotton bollworm *Helicoverpa armigera*. The appearance of the moth larvae from the first generation were noticed in May, but with smaller intensity and did not caused more serious damages on tomatoes. With higher intensity appear around 15 of July, when tomatoes were planted as second culture and when the first fruits were formed. Because of not on time treatment with insecticides, the intensity of larvae development increased, so as the damages, and they culminated in the second half of August and in September. The biggest damages caused the larvae from the second and third generation. In 2007 the damages ranged from 5—30 % in some localities. When using measures for protection, first the plant should be examined. Examination is made on the underside of the leaves near the flowers, to see if there are eggs. If there are one or more larvae on six plants

before flowering it should be treated with insecticides. After flowering it should be treated if there is one egg or larvae on the field. Also, insecticides must be present on plants when the larvae come out from the eggs, so they can touch the lethal dose of the insecticide.

CONCLUSIONS

During 2007 and 2008 more harmful insects are present on tomatoes grown in greenhouses. On tomatoes grown as second culture with higher intensity appeared *Trialeurodes vaporariorum*, *Aculops lycopersici*, *Tetranychus urticae* and *Helicoverpa armigera*. While, in early spring production the most important pests were leaf aphids, the leaf miner and the thrips.

In 2007 the cotton bollworm *Helicoverpa armigera* caused damages from 5—15%, and the whitefly *Trialeurodes vaporariorum* caused damages to 30% on some localities.

In 2008 with higher intensity appear the mite *Aculops lycopersici*, and caused damages to 20% on some localities. Also the whitefly, *Trialeurodes vaporariorum*, caused damages to 40% in some localities.

For successful control of pests on tomatoes grown in greenhouses, besides chemical control, integrated methods should be used.

The crop rotation, as agro technical measure should be used.

The weed control is one of the important measures that should be used.

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