DISEASES AND PESTS ON TRIBULUS TERRESTRIS L.-
WILD GROWING PLANT AND SEMI-CROP

Stoyka Masheva, Vinelina Yankova, Dima Markova, Hrska Boteva, Tsvetanka Dincheva
Maritsa Vegetable Crops Research Institute, Plovdiv, Bulgaria
Corespondence to: Hrska Boteva
E-mail: izk_maritsa@abv.bg

ABSTRACT
Surveys for identification of diseases and pests attacking Tribulus terrestris L. in natural habitats and cultivated sowing of Tribulus terrestris L. were conducted. Damage caused by mildew (Phytophthora spp.) were observed during the vegetation period. Colonies of a mixed population (larvae and adults) of cotton aphid (Aphis gossypii Glov.) and damage from caterpillars (Lepidoptera:Noctuidae) were established. Caterpillars of the cotton bollworm (Helicoverpa armigera Hb.) and Leucanithis stolida F. were observed from July to August. Attack of spider mite (Tetranychus urticae Koch.) both in natural habitats and cultivated sowing was observed during the whole vegetation period.

Materials and Methods
The studies were conducted during the period 2009-2010 in Maritsa VCRI, Plovdiv, in natural habitats and experimental sowing with Tribulus terrestris L. Plant samples were taken and the species composition of diseases and pests were determined.

Habitats:
- Cultivated sowing
- Natural habitat A (field - variety maintenance)
- Natural habitat B (greenhouse)
- Natural habitat C (field)

Diseases
Surveys for pests and diseases of T. terrestris were conducted both in the field and in the experimental plot.

A visual assessment of the attack from diseases was made and plant samples for identification of pathogens were taken. Microscopic preparations and isolates were prepared.

Pests
A visual assessment of pest attacks was made and plant samples were taken for identification of the species. Assessment for the degree of infestation by the aphids was made by a modified four-digit scale (3):

- 0 - no aphid colonies;
- 1 - less than 1 aphid per plant;
- 2 - less than 10 aphids per plant;
- 3 - less than 100 aphids per plant.

The observation was done on a representative plant sample of 10 plants. Each plant was evaluated individually and the average value for the sample was calculated.

The percentage of plants attacked by the two-spotted spider mite (Tetranychus urticae Koch.) was calculated.
Results and Discussion

Diseases

In the region of VCRI Maritsa in September the damage from mildew on single plants, both in the experimental sowing and in the natural habitats was established. Watery brownish spots were observed on the leaves, covered with a whitish bloom on the underside. Fungi with unseptate mycelium with dichotomous branches at acute angles, conidia ending with pointed sterigma and colorless, elliptical conidiospores without an apical cap were determined by prepared microscope preparation. The presence of unseptate mycelia is an indication that the fungi belonged to the *Oomicetes* class, and tapered sterigma – the *Peronospora* genus. This is evidence of mildew attack by the agent *Peronospora* spp. At present there are no reports of attack by the disease, which does not allow us to determine the species of the agent (Fig. 1).

Two-spotted spider mite (*Tetranychus urticae* Koch.) occurred in April in the natural habitats of *T. terrestris* on the first germinated plants. Silvery-white spots were observed which were merging. Damaged leaves appeared streaky marble, entangled in a spider’s web. Leaves and shoots dried up at high-density infestation. The damage by the two-spotted spider mite was better expressed under the conditions of increased temperatures and lower atmospheric humidity during the summer months from June to August. Drying up of whole plants was observed. Usually the pest was initially seen on individual plants, later the damage covered groups of plants and at the end of August in some of the natural *T. terrestris* habitats all the plants were attacked by the two-spotted spider mite. The weakest attack was found at the experimental sowing and the highest percentage of infested plants - in natural habitat (A) (Fig. 2).

After the monitoring it was established that there were less attacks by the cotton aphid and the two-spotted spider mite in the experimental sowing. Other pests observed in the natural habitats and at the experimental sowing with *T. terrestris* were different *Lepidoptera* species. They are polyphagous and can be observed both on cultured and on wild species. Single damage by *Leucanithis stolida* F. and *Mamestra oleraceae* L. were observed in June. Damage by the cotton bollworm (*Helicoverpa armigera* Hbn.) was established at the end of August and at the beginning of September. Nibbled leaves and nibbled top parts of shoots were observed. In some plants the leaves were almost completely destroyed by *L. stolida* and only the venation remained. Needle-like perforations were observed on the seed boxes.

**Fig. 2.** Rate of infestation by cotton aphid (*Aphis gossypii* Glov.) in *Tribulus terrestris* L.
Conclusions

1. Attacks from diseases and pests were recorded in the experiments conducted with Tribulus terrestris L. both in experimental sowing and in the natural habitats near Maritsa VCRI-Plovdiv.

2. The damage to the leaves of T. terrestris L. in the natural habitats and in cultivated sowing was a result of mildew caused by fungus Peronospora spp.

3. Two-spotted spider mite (Tetranychus urticae Koch.), cotton aphid (Aphis gossypii Glov.) and species from the Noctuidae family were established among the pests.

4. The attack of the cotton aphid and the two-spotted spider mite was weaker in cultivated sowing.

Acknowledgements

This work was supported by the National Science Fund of Bulgaria (BNSF), grant DO 02-246.

REFERENCES