

# Pests in the vegetable garden in September and October

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*The forecast minimum temperature values are above the critical levels for vegetable crops, which is a prerequisite for obtaining additional vegetable production from late field cultivation.*

## Pests

### Tomato leafminer moth

It continues to damage tomatoes

## Species – *Tuta absoluta*

### Damage

- The larvae cause the damage;
- They prefer the leaves and stems of the plants, but also attack the fruits;
- The damage appears as short and wide mines on the leaves, in which larvae and excrement can be seen;
- On the fruits, mines are observed, which serve as an entry point for the development of rot processes;
- It causes significant losses of the tomato yield, with damage reaching up to 100%.

### Development

- The moths are active at night and hide during the day;
- The larvae cause the damage;
- Depending on environmental conditions, it can develop 10-12 generations per year;
- The species overwinters as egg, pupa or adult in the soil, in plant residues or in other shelters.

### Control

Use of pheromone traps for monitoring and reducing population density;

- Placement of black sticky traps;
- At low population density in greenhouses, one of the biological control agents *Macrolophus pygmaeus* or *Nesidiocoris tenuis* may be introduced;
- Treatment with plant protection products (PPP) upon appearance;
- Economic threshold in greenhouses: larvae – 10% of the leaves with mines; 4% of the fruits damaged;
- **Authorized PPP:** Avant 150 EC 25 ml/da; Alverde 240 SC 100 ml/da; Altacor 35 WG 8-12 g/da; Ampligo 150 ZC 40 ml/da; Affirm 095 SG 150 g/da; Bermektin 50-100 ml/da; Voliam Targo 063 SC 0.08%; Confidor Energy OD 80 ml/da; Coragen 20 SC 14-20 ml/da; Exalt 200-240 ml/da; Lanat 20 SL 125 ml/da; Lanat 25 WP 100 g/da; Minecto Alpha 100 ml/da; Mospilan 20 SP 0.02%; Nim Azal T/C 0.3%; Picador 20 SL 0.05%; Rapax SBS 100-200 ml/da; Sineis 480 SC 10-25 ml/da; Warrant 20 SL 50 g/da.

**Due to intensive harvesting during the period, PPP with a shorter pre-harvest interval should be selected.**

**Thrips: tobacco thrips and western flower thrips**

*Species – Thrips tabaci and Frankliniella occidentalis*

## *Damage*

- On the leaves, petioles, flowers and fruits, small whitish spots with dark dots appear – the pest's excrement;
- At higher population density the spots merge;
- The generative organs of plants attacked in the early stages of development dry up and fall off;
- They are vectors of tomato spotted wilt virus (bronzing).

## *Development*

- Mainly on the leaves, less often on the flowers;
- They develop at high temperatures and low air humidity;
- The western flower thrips mainly attacks the flowers;
- After feeding, the larvae enter the soil and at a depth of about 5 cm they transform into nymphs;
- During one growing season 6-7 generations can develop, and under greenhouse conditions the pest occurs year-round;
- They overwinter as adults or as larvae of different ages in plant residues of infested plants, on weeds and in the soil.

## *Control*

- Regular field inspections;
- Placement of blue sticky boards;
- Immediate treatment with PPP upon appearance;
- Economic thresholds:

*Tomatoes in greenhouses* – western flower thrips: adults 1 per flower; tobacco thrips – adults and larvae 3 per leaf;

*Peppers* – flowering: adults and larvae 2 per flower; fruiting: 3 per fruit;

*Eggplant* – flowering: adults and larvae 2 per flower; fruiting: 3 per fruit;

*Cucumbers* – during vegetation: adults and larvae 1 per flower, 3-5 per leaf;

- **Authorized PPP:** Exalt 200-240 ml/da; Deka EC / Desha EC / Dena EC / Poleci / Decision 30 ml/da; Dicarzol 10 SP 556 g/da; Lanat 25 WP 80-100 g/da; Meteor 0.06-0.07%; Minecto Alpha 100 ml/da; Naturalis 100-150 ml/da; Oikos 100-150 ml/da; Sineis 480 SC 10-37.5 ml/da; Requiem Prime 500-1000 ml/da; Limocid 400-800 ml/da.

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## Two-spotted spider mite

Hot and dry weather is a prerequisite for severe infestation

*Species – Tetranychus urticae*

### Damage

- They live and feed on the underside of the leaves;
- At the feeding site a light, pinpoint spot is formed;
- Under heavy infestation the leaves are covered with webbing;
- Later the spots merge and the leaf becomes marbled;
- Under severe infestation the plants dry out.

### Development

- The mites prefer older leaves with reduced water content, as well as drought-stressed, senescent plants;
- In greenhouses they develop continuously.

### Control

- Destruction of weeds in and around the crops;
- Maintaining optimal soil moisture;
- Regular inspection of crops for early detection of mite infestation;
- Treatment with PPP upon appearance;
- Economic thresholds:

*Tomatoes:* flowering-fruiting, larvae–adults 5-10% infested plants;

*Peppers:* during vegetation, larvae-adults 5-6 per leaf;

*Cucumbers:* during vegetation, larvae-adults 5-10% infested plants;

- **Authorized PPP:** Apollo 50 SC 30-40 ml/da; Apache EW 30-100 ml/da; Akramite 480 SC 20-25 ml/da; Boutique 30-100 ml/da; Bermektin 15-100 ml/da; Vertimec 018 EC 60 ml/da; Valmek 15-100 ml/da; Voliam Targo 80 ml/da; Zoom 11 SC 30-35 ml/da; Laota 15-100 ml/da; Masai WP 15-25 g/da; Nelta SC 100 ml/da; Nissorun 10 WP 50-75 g/da; Nim Azal 0.3%; Danitron SC 100-200 ml/da; Requiem Prime 500-1000 ml/da; Sulphur WG 300 g/da; Thiovit Jet 80 WG 300 g/da; Floramite 240 SC 40 ml/da; Naturalis 100-200 ml/da.

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## Cotton bollworm

It continues to damage tomatoes and peppers

*Species – Helicoverpa armigera*

### Damage

- Initially the larvae gnaw the leaves, buds and flowers;
- Later they attack the fruits, bore into them and feed on their contents;
- Damaged fruits do not grow, become deformed and rot due to secondary pathogens.

### Development

- It overwinters as a pupa in the soil;
- It develops three generations per year;
- Adults occur from May to October;
- Fecundity depends on air temperature and humidity, on the availability of nectar for sexual maturation of the moths and on the plants on which the larvae feed;
- The greatest damage to vegetable crops is caused by larvae of the second generation.

### Control

- Regular field inspections;

- Use of pheromone traps for monitoring;
- Destruction of weed vegetation in and around the crops;
- Treatment with PPP is effective when targeted against young larvae;
- Economic thresholds:

*Tomatoes*: fruit set, larvae 5% damaged fruits;

*Peppers*: fruit set, larvae 3-5% damaged fruits;

- Two treatments are necessary at an interval of 8-10 days, depending on weather conditions and the residual effect of the insecticide;
- The egg parasitoid *Trichogramma* spp. can also be used for pest control;
- **Authorized PPP**: Avant 150 EC 25 ml/da; Altacor 35 WG 8-12 g/da; Ampligo 150 ZC 40 ml/da; Affirm 095 SG 150 g/da; Vaztak New 100 EC 10 ml/da; Voliam Targo 80 ml/da; Deltagri 30-50 ml/da; Decis 100 EC 7.5-12.5 ml/da; Infis 50 ml/da; Exalt 200-240 ml/da; Coragen 20 SC 14-20 ml/da; Lanat 25 WP 80-100 g/da; Lanat 20 SL 125 ml/da; Oikos 100-150 ml/da; Minecto Alpha 100 ml/da; Rapax 100-200 ml/da; Citrin Max 10 ml/da; Helicoverex 20 ml/da.
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- **Cabbage moth**

*Species – Mamestra brassicae*

*Damage*

- The larvae cause feeding damage on the leaves and cabbage heads;
- After hatching, the larvae live on the underside of the leaves; later they eat the leaves leaving only the thick veins and then bore into the cabbage head;

Damaged cabbage heads have an unpleasant odor.

*Development*

- It develops two to three generations per year;
- It overwinters as a pupa in the soil.

*Control*

- Regular inspections of transplanted plants;
- Treatment with PPP upon detection of infestation;
- Economic thresholds:

*Late production, larvae* 15-18 per 100 plants;

- **Authorized PPP:** Avant 150 EC 17 ml/da; Altacor WG 8-10 g/da; Karate Zeon 5 CS 15 ml/da; Deka EC / Desha EC / Dena EC / Poleci / Decision 30 ml/da; Decis 100 EC 12.5 ml/da; Dukat 25 EC 30 ml/da; Meteor 60-70 ml/100 l water; Sumi Alpha 5 EC / Sumicidin 5 EC / Oasis 5 EC 25 ml/da; Dipel 2 X 100 g/da.

***An adjuvant should be added to the spray solution.***

## Diamondback moth

*Species – Plutella maculipennis*

### Damage

- The larvae cause damage already at the seedling stage. They bore under the epidermis and mine the leaves;
- Older larvae damage the outer and inner leaves of the cabbage head and subsequently the heads remain small and deformed.

### Development

- It develops four to six generations per year;
- It overwinters as a pupa on plant residues and under soil clods.

### Control

- Regular inspections of transplanted plants;
- Treatment with PPP upon detection of infestation;
- Economic threshold: after head formation, larvae causing 10% damaged leaf mass;
- **Authorized PPP:** Altacor WG 8-10 g/da; Vaztak New 100 EC 10 ml/da; Deka EC / Desha EC / Dena EC / Poleci / Decision 50 ml/da; Meteor 80-90 ml/100 l water; Mageos 7 g/da; Sumi Alpha 5 EC / Sumicidin 5 EC / Oasis 5 EC 25 ml/da.

***An adjuvant should be added to the spray solution.***

## Large and small white butterflies of cabbage

*Species – Pieris brassicae and Pieris rapae*

### *Damage*

- Young larvae live together up to the second instar. They gnaw the leaves without affecting the upper epidermis;
- Older larvae eat the leaves completely, together with the thin veins, skeletonizing them and leaving only the thick veins.

### *Control*

- Regular inspections of transplanted plants;
- Treatment with PPP upon detection of infestation;
- Economic thresholds: after transplanting the crop, when more than 1% of the plants are heavily infested or 2-3 larvae/plant are found. In later stages – egg clusters on 5% of the plants or 25% damaged leaves from larvae;
- **Authorized PPP:** Avant 150 EC 17 ml/da; Altacor WG 8-10 g/da; Vaztak New 100 EC 10 ml/da; Dipel 2 X 100 g/da; Dukat 25 EC 30 ml/da; Mageos 7 g/da; Meteor 60-70 ml/100 l water.

***An adjuvant should be added to the spray solution.***