

Plant protection practices in vegetable crops in May

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Plant protection measures for vegetable crops in May continue both in greenhouses and in the open field. During this month, the weather warms up and stabilizes in terms of temperatures and precipitation. Nevertheless, regular monitoring is essential for the timely implementation of plant protection practices. Pests must not be allowed at the beginning of vegetation, as this largely determines the future phytosanitary status of the crops.

With the ongoing climate change, successful overwintering of many pests is expected and there is a risk of infestation already at the beginning of the production season.

Seedling production

In the greenhouses, seedlings for medium-early field production of tomatoes, peppers, eggplants and cucumbers are still being grown, which are transplanted at the beginning of the month. If the weather becomes permanently warmer, they must be shaded. Regular ventilation will protect them from increased air humidity, which is a prerequisite for the occurrence of fungal diseases, aphids, etc.



If during the period there are temperature depressions, it is possible for “**true damping-off**” to occur. The first diseased plants are collected in a bag and destroyed outside the facility. The places beneath them are disinfected by watering with a 3% solution of copper sulfate or ammonium nitrate (3-4 l/m²). The remaining plants are treated with registered fungicides – Beltanol 400 g/da, Proplant 722 SL 0.1% at 25-50 ml/plant, depending on their size.

Attacks by leaf spot diseases are possible – **early blight**, **grey mould** and **leaf mould** in tomatoes and **downy mildew** and **powdery mildew** in cucumbers.

Grey mould and early blight develop at high air humidity, while powdery mildew – at low humidity. Therefore, in the seedling facility, an optimal temperature-humidity regime must be maintained.

Among the pests on seedlings during this period, the most common are: **thrips, greenhouse whitefly, aphids, leaf-mining flies, caterpillars, tomato leaf miner, mites**. For monitoring and reducing population density, sticky traps are placed – yellow (for whitefly and aphids), light blue (for thrips), black (for tomato leaf miner) and yellow-orange (for leaf-mining flies). If necessary, treatments with authorised plant protection products (PPP) are carried out.

Control of diseases and pests is described under Greenhouse production.

One week before moving the seedlings outdoors, they are sprayed preventively with a broad-spectrum insecticide such as Deltagri 30-50 ml/da; Closer 120 SC 20 ml/da; Sineis 480 SC 10-25 ml/da and the fungicides Polyram DF 0.2% or Signum 0.1%.



Greenhouse production

The cultivated crops are in the fruiting stage. In unheated greenhouses the first harvests begin, and in heated ones mass harvests are carried out – 2-3 times a week. It is necessary to carefully select PPPs – with a shorter pre-harvest interval. Pre-harvest intervals must be strictly observed.

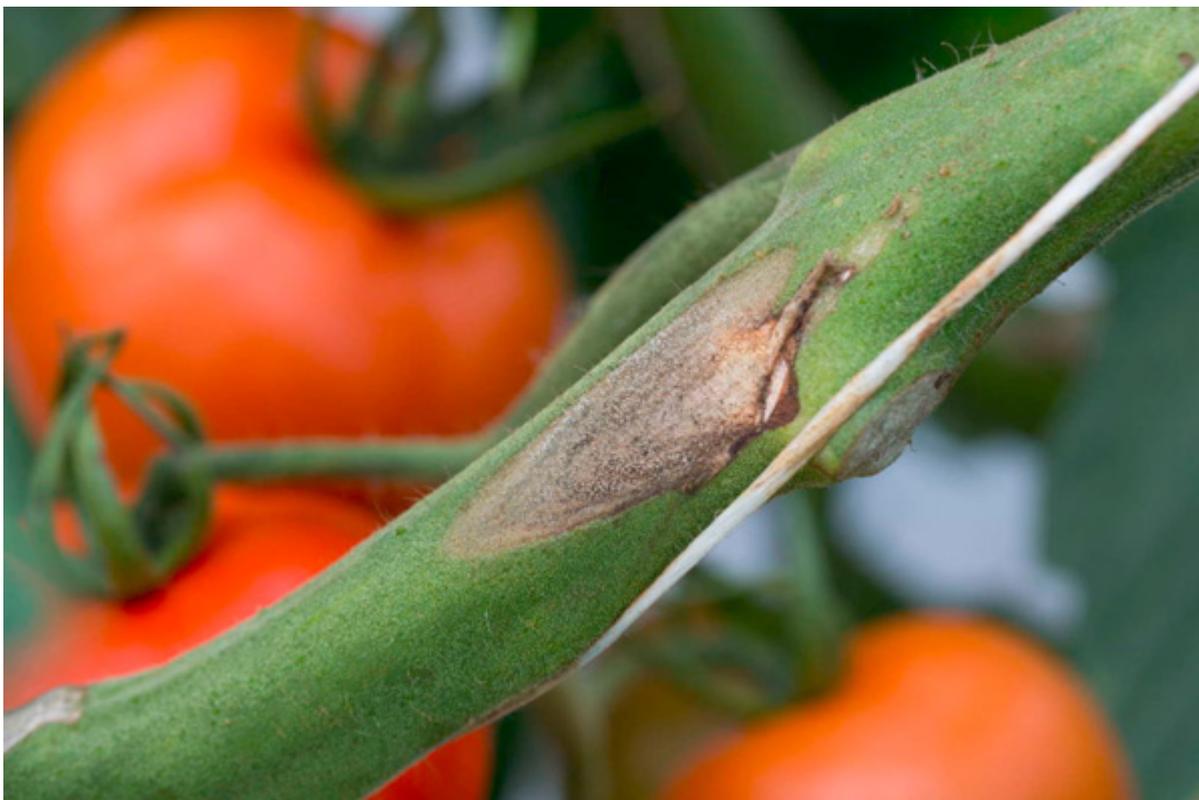
Due to the increase in outside temperatures and the intensity of sunlight, shading must be provided where it has not yet been done. For this purpose, lime solution or ready-made mixtures available in agro-pharmacies are

used. To maintain air humidity in the facilities, the paths must be moistened several times a day. The crops must be inspected daily or at least twice a week for disease and pest infestation. Coloured sticky traps, which are placed already at planting at the level of the plant tops, can be used as sources of information. During vegetation they follow the growth of the plants. Leaves, petioles and fruits with disease spots, aphid colonies, egg clusters, larvae, mines, etc. are collected, removed from the greenhouse and destroyed.

On the plants in the greenhouses, the **diseases** listed for seedlings can be observed:

In tomatoes these are: **early blight (Alternaria)**, **grey mould (Botrytis)**, **leaf mould**. In case of infestation, the crops are treated with registered PPPs as follows:

Against **early blight** – Azaka 80 ml/da; Dagonis 100 ml/da; Zoxis 250 SC 70-80 ml/da; Kopfor Extra 200 g/da; Ortiva Top SC 100 ml/da; Prev-Gold 200-600 ml/da; Sinstar 70-80 ml/da; Taegro 18.5-37.0 g/da; Tazer 250 SC 80-200 ml/da.



grey mould (Botrytis) on tomatoes

Against **grey mould** – Geox WG 50 g/da; Pretil 200 ml/da; Prolectus 50 WG 80-120 g/da; Signum 100-150 g/da; Switch 62.5 WG 100 g/da; Folpetis 50 SC 250 ml/da; Fontelis SC 240 ml/da.

Against **leaf mould** – Eminent 125 ME 40-60 ml/da; Zoxis 250 SC 70-80 ml/da; Ortiva Top SC 100 ml/da; Signum 100-150 g/da; Sinstar 70-80 ml/da; Folpetis 50 SC 250 ml/da. Tomato seeds of varieties resistant to **leaf mould** are available on the market.



downy mildew

In cucumbers: The main diseases that can be harmful in cucumbers are **downy mildew** and **powdery mildew**. Many of the cucumber varieties grown in greenhouses are resistant to powdery mildew, and some also to downy mildew. In susceptible varieties, after the occurrence of **powdery mildew**, treatment is carried out with registered fungicides: Vivando 20 ml/da (0.02%); Dagonis 60 ml/da; Domark 10 EC 50 ml/da; Zoxis 250 EC 70 ml/da; Collis SC 40-50 ml/da; Legado 80 ml/da; Ortiva Top SC 100 ml/da; Sivar 80 ml/da; Sonata SC 500-1000 ml/da; Taegro 18.5-37.0 g/da; Topaz 100 EC – 35-50 ml/da; Trunfo 80 ml/da; Phytosev 200 ml/da; Fontelis SC 240 ml/da.

Providing heating in the early morning hours limits infestation by **downy mildew**. Upon occurrence, spraying is carried out every 7-10 days with authorised PPPs: Enervin SC 120 g/da; Zoxis 250 SC 70-80 ml/da; Infinito SC 120-160 ml/da; Corzate 60 WG 20-30 g/da; Prev-Gold 160-600 ml/da; Taegro 18.5-37.0 g/da.

Pests



greenhouse whitefly

Thrips, aphids, greenhouse whitefly, tomato leaf miner, caterpillars and mites cause damage.

For monitoring **thrips**, blue sticky traps are used which, in greater numbers, reduce pest density. Upon occurrence, treatment with PPP is carried out at economic threshold levels (ETL) for tomatoes of 1 adult/1 flower, 3 adults and larvae/1 leaf; for cucumbers 1 adult and larvae/flower, 3-5 adults and larvae/leaf.

Authorised PPPs: Azatin EC 100-150 ml/da; Dicarzol 10 SP 556 g/da; Exalt 200-240 ml/da; Limocid 400-800 ml/da; Minecto Alpha 100-125 ml/da; Niimik Ten 390 ml/da; Oikos 100-150 ml/da; Requiem Prime 500-1000 ml/da; Sineis 480 SC – 10-37.5 ml/da, Naturalis 100-150 ml/da.

Aphids have a high reproductive capacity. They are vectors of viral diseases. When the first individuals are detected, treatment should be carried out with one of the authorised PPPs: Azatin EC 100-150 ml/da; Ampligo 150 ZC 40 ml/da; Delmur 50 ml/da; Deltagri 30-50 ml/da; Closer 120 SC 20 ml/da; Mavrik 2 F 20 ml/da; Niimik Ten 390 ml/da; Oikos 100-150 ml/da; Sivanto Prime 45 ml/da; Tepeki/Afinto 10 g/da; Flipper 1-2 l/da; Shirudo 15 g/da.

For monitoring the occurrence and density of **greenhouse whitefly**, yellow sticky traps are used. At low density in greenhouses, the biological agent *Encarsia formosa* can be introduced. Treatment with PPP at ETL for

tomatoes: 10 adults/1 plant; for cucumbers: 5 adults/plant.

Registered PPPs: Abanto 75 ml/da; Azatin EC 100-150 ml/da; Brav 50-112.5 ml/da; Limocid 400 ml/da; Closer 120 SC 20-40 ml/da; Krisant EC 75 ml/da; Minecto Alpha 100-125 ml/da; Natur Breaker 75 ml/da; Niimik Ten 390 ml/da; Oikos 100-150 ml/da; Orocid Plus 80-800 ml/da; Pyregard 75 ml/da; Prev-Gold 160-600 ml/da; Requiem Prime 500-1000 ml/da; Sivanto Prime 56 ml/da; Naturalis 75-100 ml/da.

For control of **tomato leaf miner**, pheromone traps and black sticky boards are used for its timely detection, for reducing density and for taking adequate control measures. At low density, one of the biological agents *Macrolophus pygmaeus* or *Nesidiocoris tenuis* can be introduced. Treatment with PPP is carried out at ETL – 10% of the leaves have mines.

Authorised PPPs: 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; Voliam Targo 063 SC 80 ml/da; Delmur 50 ml/da; Exalt 200-240 ml/da; Coragen 20 SC 14-20 ml/da; Minecto Alpha 100-125 ml/da; Nim Azal T/S 0.3%; Niimik Ten 390 ml/da; Oikos 150 ml/da; Rapax SBS 100-200 ml/da; Sineis 480 SC 10-25 ml/da.

Upon occurrence of the **two-spotted spider mite** and established economic thresholds (cucumbers – 5% infested plants; tomatoes – 10%), treatment with PPP must be carried out. Authorised products: Apollo 50 SC 30-40 ml/da; Bermectin 50-100 ml/da; Butik 30-100 ml/da; Valmec 15-100 ml/da; Vertimec 018 EC 60 ml/da; Voliam Targo 063 SC 80 ml/da; Zoom 11 SC 12.55-50 ml/da; Requiem Prime 500-1000 ml/da; Laota 15-100 ml/da; Naturalis 100-200 ml/da; Nim Azal T/S 0.3%; Nissorun 10 WP 75 g/da; Flipper 1-2 l/da; Shirudo 15 g/da.

For control of **root-knot nematodes**, one of the PPPs can be applied through the drip irrigation system: Vydate 10 L 1 l/da; Allready 1 l/da; Velum Prime 37.5-62.5 ml/da; Tervigo 500 ml/da.



Field production

Transplanting of medium-early tomatoes, peppers, eggplants and cucumbers is forthcoming. Before transplanting, against **mole cricket**, Belem 0.8 MG/Colombo 0.8 MG 1.2 kg/da is applied in the furrows.

In the field, early crops of cabbage, onion, garlic, potatoes, peas, faba bean and beans are in a phase of intensive growth and development. Upon occurrence of **downy mildew** on cabbage and peas, treatments are carried out with suitable PPPs: Infinito SC 160 ml/da; Tazer 250 SC 80-100 ml/da. In potatoes, attacks by early blight and late blight are possible. Against late blight, treatment is carried out with: Banjo 30-40 ml/da; Vitene Triplo R 400-450 g/da; Vitra 50 WP 150 g/da; Daramun 80 ml/da; Dimix 500 SC 30-36 ml/da; Diflunova 100 ml/da; Enervin SC 120 g/da; Infinito SC 120-160 ml/da; Kopfors Extra 200 g/da; Corzate 60 WG 15-20 g/da; Manamid 100 SC 80 ml/da; Revus 250 SC 50 ml/da; Rival Duo 250 ml/da; Simbal Flow 50 ml/da; Taegro 18.5-37.0 g/da. For control of early blight, the following PPPs are registered: Vitene Triplo R 400-450 g/da; Taegro 18.5-37.0 g/da. In already transplanted early tomatoes, monitoring is carried out for early blight and late blight, and in case of intense rainfall – also for bacterial diseases. Against the first two, treatment is carried out with PPPs indicated for seedlings and greenhouse production, and against bacterial leaf spots the following are applied: Taegro 18.5-37.0 g/da; Funguran OH 50 WP 0.3%, 0.25%.

Thrips are polyphagous and can be observed on many vegetable crops during the growing season. It is necessary to monitor their population density and, if necessary, carry out treatments with authorised PPPs for

the respective crop. Control of the **leaf-mining fly** on Allium crops and the **cabbage root fly** on cabbage continues. Control of these flies is directed against the adult forms. The following are effective: Deka EC/Desha EC/Dena EC/Poleci/Decis 50 ml/da. Two treatments are carried out at an interval of 7 to 10 days. Against cabbage root fly, Force 1.5 G 300-500 g/da can be applied before or during transplanting. In cabbage, damage from **diamondback moth** can be observed. The following PPPs are registered against this pest: Sumi Alpha 5 EC/Sumicid 5 EC/Oasis 5 EC 25 ml/da; Exalt 200 ml/da; Altacor 35 WG 8-10 g/da. Against **pea aphid**, treatment can be carried out with Vaztak Nov 100 EC 12.5 ml/da; Sumi Alpha 5 EC/Sumicid 5 EC/Oasis 5 EC 20 ml/da. Effective against **pea weevil** are Sumi Alpha 5 EC/Sumicid 5 EC/Oasis 5 EC 25 ml/da. The first spraying is during flowering, therefore measures must be taken to protect bees. Aphids and pea weevil are often observed simultaneously in the crops.

Leafy vegetables – lettuce and spinach, as well as green onion and garlic and radishes intended for fresh consumption, should be treated only as a last resort, strictly observing the pre-harvest intervals. When spraying Allium and brassica crops, an adjuvant is added to the pesticide solutions.

ATTENTION!

Only PPPs at the registered dose, included in the LIST OF PLANT PROTECTION PRODUCTS AUTHORISED FOR PLACING ON THE MARKET AND USE, published on the BFSA website, shall be applied.

PPPs shall be purchased only from traders holding an authorisation for the activity and included in the LIST OF COMPANIES AUTHORISED TO CARRY OUT THE ACTIVITIES OF WHOLESALE TRADE IN PLANT PROTECTION PRODUCTS, RETAIL TRADE IN PLANT PROTECTION PRODUCTS IN AGRICULTURAL PHARMACIES, REPACKAGING OF PLANT PROTECTION PRODUCTS AND FUMIGATION AND DISINFECTION OF AREAS, PREMISES AND PLANT PRODUCTION AGAINST PESTS, published on the BFSA website.

All requirements for the application, storage and transport of pesticides must be observed. A logbook for crop treatments shall be kept in accordance with the requirements of the BFSA.