Растителна защита
електронно списание за растителна защита
семена, торове и земеделие
ISSN 2815-522X

In the vegetable garden in winter

Author(s): проф. д-р Стойка Машева, ИЗК "Марица" Пловдив; проф. д-р Винелина Янкова, ИЗК “Марица” в Пловдив; гл.ас. д-р Дима Маркова

Date: 18.01.2021 *Issue:* 1/2021

The work of vegetable growers does not stop even in winter. This is when preparation for the new vegetation period begins. The areas are determined, plant residues from the previous vegetation and weeds are removed. The soil is cultivated.

Deep ploughing of the soil after harvesting the latest vegetables such as leek, radish, late head cabbage and broccoli must be carried out as early as December. The cabbage stalks and all other plant residues are removed from the garden and destroyed. If they remain in the garden, they provide a sure winter shelter for some of the most persistent pests – wireworms, aphids, etc. Deep ploughing has multifaceted significance – it creates a deep arable layer and improves the soil structure.

Every farm owner, respectively producer, draws up a plan for which crops will be grown, on which areas and in what volume. This plan must be aligned with the possibilities for marketing the produce, with the soil characteristics, the crop requirements, the exposure of the plots, the availability of a water source and, not least, with the climatic characteristics of the region, which are decisive for the production systems.

Of particular importance during this period of the year is the successful choice of **vegetable variety and the procurement of the necessary seeds**. When assessing, attention must be paid not only to various qualitative indicators related to one's own taste or consumer preferences when producing for the market, but also to the maturity period, in view of meeting the needs in the desired period. Of great importance when choosing a variety are its productivity (yield), taste qualities and, not least, resistance to diseases and pests. **Seeds** are of primary importance for vegetable growers. They must be supplied in good time. Today the market offers considerable diversity, but at the last moment you may not find what you need and, while searching for it, you may miss the favourable time window.

At present in our country vegetables are produced both in protected cultivation facilities and in the open field. Protected cultivation facilities include steel-glass greenhouses, greenhouses with polyethylene covering and low tunnels. More widespread and on a larger scale is open-field production – the so-called field production.

Greenhouse production of vegetables is almost year-round and has many advantages over field production. In it, crops are protected from extreme conditions – wind, heavy rains, low temperatures. During this period, late production is terminated. Where possible, fumigation is carried out to destroy the reservoir of diseases and pests on the old plants by evaporating 60 l formalin + 6 kg potassium permanganate per 0.1 ha. Treatment by sulphur sublimation – 5 kg/0.1 ha – may also be applied. After good ventilation of the premises and drying of the plants, all plant residues and weeds are collected, removed and destroyed at designated places. The soil is cultivated to a garden condition. If necessary, it is moistened beforehand. The soil profile is shaped depending on the crop to be grown. If disinfection with fumigants was carried out in autumn, a degassing test is mandatory.

In greenhouses that were vacated earlier, lettuce, radishes, onion and green garlic and spinach are already being grown, which are at different stages of development depending on the sowing and transplanting dates. Where suitable temperature and air humidity are present, lettuce may be attacked by downy mildew, grey mould or aphids. Plant protection treatments are carried out only as a last resort, in accordance with the growth stage of the plants and the pre-harvest interval of the products. Approved products: against downy mildew – Galbex 250 g/0.1 ha, pre-harvest interval 15 days; Kylate WG 250 g/0.1 ha, pre-harvest interval 15 days; Keyfol WG, pre-harvest interval 15 days; against grey mould – Serenade ASO SC 400 ml/0.1 ha; Fontelis SC 150 ml/0.1

ha, pre-harvest interval 7 days; against aphids – Closer 120 SC 20 ml/0.1 ha, pre-harvest interval 7 days; Biscaya 240 OD 0.06%, pre-harvest interval 3 days; Mospilan 20 SG 25 g/0.1 ha, pre-harvest interval 14 days; Poleci 50 ml/0.1 ha, pre-harvest interval 3 days; Oikos 100–150 ml/0.1 ha, pre-harvest interval 7 days; Chrysant EC 60 ml/0.1 ha, pre-harvest interval 2 days. Other approved aphicides may also be used.

Seedling trays, pots, hoes, shovels and other tools can be disinfected by soaking in a 2% solution of copper sulphate for 24 hours.

Seedling facilities are prepared for sowing seedlings for unheated glass and polyethylene greenhouses and for low tunnels. They are cleaned of plant residues from the previous vegetation, weeds and volunteers. The seedling substrate is prepared. It is best for it to be a peat-perlite mixture, which is used to fill seed trays, flats and pots. If they are placed directly on the soil, the surface must be well levelled. A polyethylene film is laid over it, which insulates the seedling containers from the soil and prevents the passage of pathogens and pests.

Disinfected seeds should be used for sowing; this is indicated on the original packaging. If such indication is missing, then disinfection is carried out by:

- Thermal treatment of cucumber seeds in a thermostat against viruses according to a specific scheme. It is carried out only by specialists so as not to damage seed germination.

- Soaking in chemical solutions:

– In a 3% solution of perhydrol (1 part perhydrol (30%) + 9 parts water) with exposure: for tomato 25 minutes, cucumber – 20, pepper and eggplant – 30, pumpkin – 60, watermelon – 120, small-seeded crops – 15 minutes. The seeds are continuously stirred and then rinsed under running water for 30 minutes and dried.

– In a 20% solution of hydrochloric acid for 30 minutes, which is effective against viruses and bacteria.

– Treatment in hot water (50–52^{0}C) against bacteria and fungi in small-seeded crops.

– Dusting the seeds with 2 g Captan 50 WP per 1 kg seed to protect against secondary infections after sowing the seeds.

If seedling substrates are used to which soil or farmyard manure is added, they must be disinfected, or the seedbed is dusted with 3–4 g/sq.m Medyan Extra 350 EC, Kocide 2000 WG or Funguran OH 50 WP. Before

ISSN 2815-522X

covering the seeds with substrate, baits against mole crickets are scattered – 500 g/0.1 ha Force 1.5 G or 1.2 kg/0.1 ha Belem 0.8 MG.

Field production

After determining the areas, soil preparation for the next vegetation period begins. After ploughing, the plots on which the vegetables will be grown on raised beds are profiled.

In January, potatoes are prepared for planting. The premises and crates are disinfected with a 2% solution of copper sulphate. Only healthy tubers are selected for sprouting.

Preparation of the areas for sowing and planting early vegetable crops begins – faba bean, pea, onion, garlic, potato, etc. Onion sets and garlic cloves are treated by dusting with 2 g/kg Dithane M-45. Pea seeds are treated with the same product.

In Bulgaria three production systems in field production are clearly differentiated: early, medium-early and late. Sowing of seeds for early production is done at the end of January – beginning of February, for medium-early at the end of February – beginning of March, and for late – in mid-May.

Producers must decide which crops and which varieties of them they will grow, on what areas and after which predecessors they will plant them. It is advisable to rely on varieties resistant to adverse conditions, as well as to diseases and pests. For the proper allocation of crops in the vegetable garden it is important to keep a field diary. It can be used to monitor the location of individual crops, to record what fertilisers have been applied, which varieties have been planted, the planting or sowing dates, and when the harvest was taken. The diary may also record the diseases and pests that have occurred, which plant protection products, when and in what concentrations have been applied to the individual crops.