

BIOLOGICAL CONTROL OF DISEASES AND PESTS IN THE PRODUCTION OF EDIBLE ORGANIC POTATOES

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Annotation. In this context, biological control of diseases and pests in organic potato production and potato production is one of the important branches of agriculture. In the following years, potato diseases and pests are a serious threat to the crop yield. The reason is that the environmental change in recent years is a favorable environment for diseases and pests.

Key words: potato, vegetation period, disease, Wilt disease, Black rot, Ring rot.

Potatoes are one of the main food products for humans. Homeland — Jan. America. About 150 wild and cultivated species, most of which grow in South and Central America. In agriculture, 2 types of Andean potato (*S.andigenum*) and Chili potato or European potato (*S.tuberosum*) are grown as annual crops. Potatoes were planted by the indigenous people of America about 14 thousand years ago. It was brought to Europe in 1565.

It began to be cultivated in Russia at the beginning of the 18th century. It was brought to Uzbekistan by Russians and Tatars who moved here from the 70s of the 19th century. The total area planted with potatoes in the world is 17.9 million ha, the yield is 16.3 t/ha, the total yield is 294.3 million t (1999). In China (3 million), in Uzbekistan, the cultivated area is 52 thousand ha, the yield is 12.7 t/ha, the total yield is 729.8 thousand t (2000). Potato (Latin: *Solanum tuberosum*) is one of the root, one-year vegetable plants and its edible crop; Perennial herbaceous plant of the Solanaceae family. one of the main food products is annual food, machinery and hay crop. Homeland — South America. About 150 wild and cultivated species grow mostly in South and Central America. In farming, 2 types of Andean potato (*S.andigenum*) and Chili potato or European potato (*S.tuberosum*) are grown as annual crops. Native Americans planted potatoes about 14,000 years ago. It was brought to Europe in 1565. It began to be cultivated in Russia at the beginning of the 18th century. It was brought to Uzbekistan by Russians and Tatars who moved here from the 70s of the 19th century. Potatoes are planted around the world total area 17.9 million ha, yield 16.3 t/ha, total yield 294.3 million t (1999). In Uzbekistan, the cultivated area is 52 thousand ha, the productivity is 12.7 t/ha, the total yield is 729.8 thousand t (2000). It is widely planted in China (3 million), Poland (1.2 million). Potatoes are used as food and fodder, as well

as raw materials for obtaining starch, alcohol, glucose, dextrin and other products. Potato tubers contain 75-80% water, 23.7% dry matter, including 17.5% starch, 1-2% protein, 0.5% sugar, 1% mineral salts, as well as vitamins V, V2, V6, C, RR, D and provitamin A (carotene), and the skin contains a poisonous substance - solonin. Potatoes play an important role in people's diet. According to physiological recommendations, the annual potato consumption per person is 45 kg.

Potatoes are moisture-loving (especially during flowering and fruiting), light-loving, somewhat cold-resistant plant. Buds in the soil begin to bloom at 5-8°. It reproduces from shoots and seeds. A virus-free seed production technology has been developed using the meristem method. The height of the potato plant is 50-80 cm, with 3-6 stems. In the underground part of the stem, underground branches - buds on stolons - potatoes appear. Potatoes are from white to red and have different shapes, and new stalks will grow next year from the pits on the surface. The root is a taproot type. The leaves are double feathery, yellow-green to dark green. The flower is bisexual, white, pale purple, 2-3, sometimes 4. It pollinates itself, sometimes from outside. In the conditions of Uzbekistan, many varieties of potatoes drop their buds and do not bloom.

The fruit is a 2-celled, many-seeded, watery berry. Vegetation period is 60-50 days. Potatoes are divided into quick ripening (60-65 days from seeding to maturity), medium quick ripening (70-80 days), medium late ripening (PO-120 days), late ripening (130-150) varieties depending on the ripening period. It is propagated by cuttings and seeds. It produces abundant crops on black or sandy soils. Potatoes are grown in the system of vegetable rotation on the land freed from cabbage, cucumber, turnip and leguminous crops.

In future potato cultivation, seeds are winterized for 20-40 days (germination is ensured in a special bright room). 60-150 kg of nitrogen (on the basis of nutrients), 100-200 kg of phosphorus and 30-60 kg of potassium mineral fertilizer, 15-20 tons of manure are applied per hectare of the land where potatoes are planted, plowed deep. For planting, mostly medium-sized (50-80 g) potatoes are allocated. It is planted at a depth of 8-12 cm, making the distance between the rows 60, 70, 90 cm, and the distance between the bushes in the row 25, 30 or 35 cm. Sowing rate is 2.5-4 tons per hectare. The average yield in intensive technology is 42-44 t/ha. In the conditions of Uzbekistan, it is grown only for food purposes. Early potatoes are planted between the end of February and March, in the southern regions even in late autumn (October-November), in the evening between the end of May and June. Between the rows of potatoes.¹

During the growing season, it is softened several times, at the rate of 500-800

¹ Азимов Б.Ж., Азимов Б.Б. Сабзавотчилик, полизчилик ва картошкачиликда тажрибалар утказиш методикаси. Тошкент. 2002. Б. 181-185.

m²/ha, it is watered and fed every 7-10 days (7-8 times) in the morning, every 8-10 days (10-15 times) in the evening. The main varieties grown in Uzbekistan Aqrab - produced at the Institute of Scientific Research of Vegetables, Rice Crops and Potatoes of Uzbekistan and regionalized in the republic since 1996. Medium late ripe, red skin, white flesh, deeper, round eyes, average weight 100-130g; Zarafshon is a fast-growing, high-yielding, low-starch variety created at the Samarkand Agricultural Institute and regionalized in the republic since 1985. Elongate-oval in shape, the skin is pale yellow, smooth, serous; Nutritious - created at the Scientific Research Institute of Vegetables, Rice Crops and Potatoes of Uzbekistan, regionalized in the republic since 1995. Medium late ripening, heat resistant variety. The buds are white, round, the flesh is white, the eyes are deeper, the average weight is 110-130g; Umid - created at the Scientific Research Institute of Vegetables, Field Crops and Potatoes of Uzbekistan, zoned since 2001, medium quick ripening, suitable for cultivation in the early and late periods, oblong-oval tuber shape, yellow flesh.

From varieties produced in Russia Sedov - early, fertile, round, large, white, well stored, does not rot; Lorh - medium-sized, fertile, large, round-oval buds, white in color, starchy; Falensky - middle-aged, with yellowish-white flesh, few eyes, white buds, elongated oval shape; Diamant is one of the varieties released in the Netherlands since 1998. Medium late ripening, flat buds, yellow, tasty; Condor - fast, red color, smooth skin, scaly; Cardinal - medium late ripening, red color, smooth bark, sercuswa is planted differently. Diseases Wilt disease - an infected plant wilts and later dries up. When the stem of the plant is cut, the affected tube tissue is brown in color. The disease spreads more on hot days; Macrosporiosis - brown circular spots appear on the leaves. Later, it becomes larger and completely covers the leaf, and such leaves dry up. The disease spreads to the stems of the plant, forming long brown spots; Black rot - the stem and lower leaves turn yellow, the upper ones are twisted in the shape of a boat. Later, the lower part of the stem darkens, thins, potatoes do not form; Ring rot - at the beginning of the disease, the potato layer withers, the end rots (brown ring rot is visible when cut). Diseases such as potato wilt, goth, small leaves, twisting of leaves seriously damage the normal growth, development and yield of potatoes. Diseases: Wilting disease - the infected plant wilts and later dries up. When the stem of the plant is cut, the affected tube tissue is brown in color. The disease spreads more on hot days. Macrosporiosis - brown circular spots appear on the leaves. Later, it becomes larger and completely covers the leaf, and such leaves dry up. The disease also spreads to the stems of the plant, forming elongated brown spots. Black rot - the stem and lower leaves turn yellow, the upper ones are twisted in the shape of a boat. Later, the lower part of the stem darkens, thins, and potatoes do not form. Ring rot - at the beginning of the disease, the potato layer withers, the end rots (brown ring rot is visible when cut). Diseases such as potato wilt, goth, small leaves, twisting of leaves also seriously

damage the normal growth, development and yield of potatoes by 20-50%, as well as the quality index. Pests: In the conditions of Uzbekistan, potatoes are often damaged by the Colorado potato beetle, aphid (plant aphid), autumn nematode, potato nematode, brown mite, aphids (sicada), worm, and mealybug. causes 30-40% serious damage to the normal growth, development and productivity of potatoes. Our farmers grow potatoes on large areas to supply the population with potatoes. But, like many other crops, potatoes are prone to some characteristic diseases, which, despite the efforts of our farmers, reduce the yield and quality of the product and slow down the ripening process. When symptoms of the disease appear, our farmers must take measures to treat potatoes to prevent the spread of infection. A number of preventive measures will help protect vegetable planting in advance.

Thus, measures to combat the most common potato diseases and pests have been developed. Control measures: one of the following preparations against the Colorado beetle is mixed and sprayed in 500-600 l/ha of water: Decis - 0.5 l/ha, karate - 0.35 l/ha, sumi alfa - 0.5 l/ha, benzophosphate (fozalon) - 2.0 kg/ha, regent - 20-25 kg/ha, Nurel D - 0.7 l/ha. When planting against autumn frost, 0.2-0.5 l/ha Decsis, 0.03% Nurel, 1% Dendrobacillin solution are sprayed on the seeds and on the plants during the growing season. BI-58-1.0-1.5 l/ha, Nurel 0.7-0.8 l/ha, tolstar - 0.8 l/ha ; poisoned baits are used against tadpoles and tadpoles. Against nematodes, in autumn or 30 days before planting, 800 - 1000 kg per hectare of 20% nemagon or thiazine, heterophos, carbation are sprinkled and mixed into a 15-20 cm layer of soil. In summary, disease prevention measures include proper organization of crop rotation, use of high agrotechnics and potash fertilizers, removal of crop residues and diseased plants, and selection of seeds. In addition, plants are sprayed with 1% bordeaux liquid, 0.3-0.5% copper chloride oxide solution and 0.5% zinc suspension against macrosporiosis. Phytophthora sometimes occurs in imported seeds. Against this, it is possible to use poisonous drugs used against macrosporiosis.²

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