in the version of 20 t/ha compost “Lencoran” + N_{120} (carbamide) $P_{150}K_{90}$ so lemon has been 20,0 t/ha 222,6%.

UDK 632.4:635.21

PHYTOPHTHOROSE – A DANGEROUS DISEASE OF POTATOES

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Potato (*Solanum tuberosum*) is one of the widespread agricultural crops from the nightshade family, popularly known as "second bread". It is used as one of the most important plants for food, technical and fodder purposes. In everyday life, a potato is characterized not as a species, but as a potato tuber. And although most of the products are grown on homesteads, every year farms expand the area for its production. The main reason for this is the high demand for it and its stable harvest.

Annual per capita consumption of potatoes in Ukraine varies between 128-136, in Lithuania - 116, Latvia - 114, and in the USA only 54 kg.

According to the State Statistics Service of Ukraine [1], in 2000, 1,631,000 hectares were planted with potatoes, which accounted for 6.0% of the country's total cultivated area. Over time, its area decreased. In 2021, only 1,283.2 thousand hectares were occupied, which is 4.5% of the entire cultivated area of Ukraine. It is worth noting that the decrease in the area under potatoes did not have a negative effect on the volume of its production. So, in 2000, 19838.1 thousand tons were collected, and in 2021 - 21356.3 thousand tons.

The yield in 2021 in Ukraine was 16.64 t/ha. This indicator was much higher in 2018 (17.05 t/ha) under more favorable weather conditions, in particular, the arrival of moisture in the form of rain (Table 1).

According to the State Statistics Service of Latvia [2], the harvest in 2019 in Latvia was 22.40 t/ha, because the weather conditions were favorable, and in 2021 - 15.30 t/ha, because in July, during the flowering of potatoes, the air temperature was +25-+30 degrees Celsius and there was no precipitation.

Table 1. Yield of potatoes in Latvia and Ukraine, t/ha

Country	Years					Average for 2018-2021	2021 in % to 2000
	2000	2018	2019	2020	2021		
Latvia	14,60	19,10	22,40	20,80	15,30	18,44	104,8
Ukraine	12,16	17,05	15,48	15,72	16,64	16,22	136,8

As shown in the table, the yield depends significantly both on the soil and climatic conditions of the growing area, and on the weather conditions in the regions of the countries.

The phytosanitary state of potato agrophytocenosis was also different by year.

Phytophthora is one of the most common diseases in all years of the potato growing season. The disease is widespread in all areas where potatoes are grown. Causative agent: fungus *Phytophthora infestans* (Mont.). It belongs to the order Peronosporales, class Oomycetes [3]. Potato growers should be advised to implement late blight preventive measures such as longer field rotation to prevent oospore infections, especially in Latvia, and to use more disease resistant cultivars and high-quality seed potatoes [4].

The disease manifests itself on almost all organs: leaves, stems, tubers, sprouts, and sometimes on buds and berries of potatoes. The disease is detected in the period of the second half of the vegetation of plants, namely from the end of budding, or at the beginning of the formation of flowers. First of all, the parts of the leaves located in the lower tier of the potato bushes are affected, and then on the leaves located in the middle and upper tiers. Phytophthora forms brown fuzzy spots on a leaf with a light green border at the ends. Warm, humid weather promotes the rapid growth of spots and they cover the entire leaf plate. The leaf rots, turns brown or dark brown and hangs on the stem. Among the most important diagnostic signs of late blight, which distinguish it from similar spots, is the formation in a wet period of a plaque made of a delicate white web on the border between the affected and healthy green tissue, usually from the bottom of the leaf.

Despite the differences in cultivation compared to other crops in Ukrainian households, potatoes also need a well-established protection system to maintain and increase productivity. To fully protect potatoes from pests, diseases, and weeds, agrotechnical, preventive, organizational, economic and chemical measures are included, that is, an integrated system of plant protection of this culture.

It is possible to avoid the disease, or to protect potatoes from it during the period of damage, thanks to the application of appropriate agrotechnical measures: select healthy planting material to prevent the transmission of the disease through the tuber; carry out vernalization of the tuber during the day as a means of accelerating the development of plants before harvesting, so that phytophthora does not spread massively. It is necessary to apply organo-mineral fertilizers, especially potassium and trace elements (boron, copper, manganese, zinc, molybdenum).

It is necessary to plant potatoes after such a predecessor, which is not affected by late blight. It is not advisable to place vegetable crops of the solanaceae family next to crops.

Prophylactic treatment of potato crops during the growing season with fungicides approved for use by the "List..." will be appropriate. The first time the plants are sprayed before the onset of the disease (the beginning of the flowering phase of potatoes), the second - 10-12 days after the first.

Infected tops are destroyed 10-15 days before the start of harvesting. Potatoes are harvested in dry weather and the tubers are dried in the field for 3-4 hours. If the tubers were collected in rainy weather, they are kept either under a canopy or in temporary sheds equipped with proper ventilation.

When the tubers are dry, they must be sorted and placed for permanent storage in a warehouse, which must be prepared and disinfected. The temperature in the storage should be maintained at the level of 1-3°C with a humidity of 86-90%.

In the southern part of the Polissia region of Ukraine, scientists consider late blight (*Phytophthora infestans* (Mont) de Vagu.) to be one of the most harmful diseases of potatoes, because its development on early varieties of potatoes can cause the death of 50-80% of the crop [5]. Therefore, an important role in preserving the crop and improving its quality is the creation of phytofluoride-resistant varieties.

A number of potato hybrids have been created by breeders of the Lviv NAU, which differ in terms of origin and maturity. At the final stage, they must undergo a selection check. The people of Lviv are the originators of the 94/89-6 hybrid (the name is the variety Zvaba). In 2016, it was transferred to the State Variety Testing in the network of variety testing stations located in the Polissia and Forest Steppe zones of Ukraine. Its resistance to damage not only by late blight, but also to other pathogens was noted [6].

Therefore, thanks to the introduction of innovative technologies in potato growing, which provide for the creation of highly productive varieties resistant to diseases, reliable protection of crops from harmful objects, it is possible to increase the volume of potato production without increasing the cultivated area.

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УДК [662.767.2+674.88]:635.63

INFLUENCE OF BIOGAS DIGESTATE, WOOD ASH AND THEIR MIXTURES ON THE YIELD AND QUALITY OF CUCUMBERS

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The biogas digestate can be an alternative of synthetic fertilizers in agricultural practice. Without additives, the drying of digestate can be unprofitable. The addition of wood ash to digestate dehydration process gives the opportunity for soil liming as well as for soil enrichment with nutrients. Within the framework of a Latvian National Research project, it was necessary to compare digestates from various raw materials and to test the possibility of mixing them with ash for using in cultivation of fast-growing crops. The research aimed to evaluate the influence of biogas digestate and wood ash on the yield and quality of cucumbers in a polycarbonate greenhouse.

The experiment was performed in 2020, using 11 fertilization treatments as well as peat (pH KCl 5.5) as the control. In the start of the experiment, no significant differences in the acidity of substrates was observed, but at the end of the investigation, pH KCl varied from 6.8 till 7.5, that was non-optimal for cucumbers growing. The development of plants under the different treatments was not significantly different ($p>0.05$).

During the experiment, cucumbers were harvested 23 times. The count of fruits per plant, depending on the treatment, per each harvesting varied from 1 till 9 (maximum result was observed for the digestate from pig manure and horse manure). A significant effect of fertilization treatment to cucumbers yield was observed ($p <0.05$). The organoleptic parameters were not differed significantly throughout the growing season ($p>0.05$).