CHAPTER 7
AGROCHEMISTRY AND SOIL SCIENCE

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PRODUCTIVITY OF ARTICHOKE ACCORDING TO THE NORM OF SEWAGE SLUDGE APPLICATION ON SODDY PODZOLIC SOILS OF PRECARPATHIAN REGION

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Formulation of the problem. One of the important tasks that the state faces is the search for the ways to strengthen food and energy security. Therefore, agrarian production is actively searching for highly productive agricultural crops of diverse use with low cost of cultivation, which would ensure a significant increase in biomass.

One of these cultures is Jerusalem artichoke. Artichoke is considered a crop that is unpretentious to the fertility of the soil. It especially responds positively to the introduction of organic fertilizers, in particular manure, compost, sewage sludge, etc.

Presenting main material. The purpose of our research was to investigate the effect of depositing sewage on the formation of the productivity of artichoke on soddy-podzolic soils in the conditions of the Precarpathian region. The research was conducted on the territory of Maidan (Tsenzhiv station) of the Tysmenitsky district of Ivano-Frankivsk region on soddy-podzolic soil. The planting scheme covers 8 variants, each in a triple repetition. Examples of options: 1. Control – without fertilizers; 2. $N_{60}P_{60}K_{60}$; 3. $N_{90}P_{90}K_{90}$; 4. SS - 20 t/ha + $N_{50}P_{52}K_{74}$; 5. SS – 30 t/ha + $N_{30}P_{33}K_{66}$; 6. SS – 40 t/ha + $N_{10}P_{14}K_{58}$; 7. Compost (SS + straw (3:1)) – 20 t/ha + $N_{50}P_{16}K_{67}$; 8. Compost (SS + straw (3:1)) – 30 t/ha + $N_{30}K_{55}$.

There was grown a variety of aristocratic Lviv artichoke, the forerunner is corn. There were planted medium-sized (30-70 g) tubers in the second decade of April to a depth of 6 – 8 cm with a distance between plants in a row of 50 cm, the width of row spacing – 70 cm. The density of plant standing is 28,6 thousand plants/ha, the method of the soil cultivation is the same as for potatoes. The

introduction of sewage sludge and mineral fertilizers contributed to the increase in the yield of artichoke tubers compared to the control variant. In particular, the artichoke yield for the introduction of mineral fertilizers (options 2 and 3) increased by 2,7–16,6 tons/hectare compared with control.

In variants 4–6, where a fresh sediment of 20–40 t/ha and mineral fertilizers was introduced, the yield of tubers was 48,8–66,9 t/ha, which is 17,4–25,1 t/ha more than in the version without fertilization and by 0,8–18,9 t/ha more in comparison with option 3 ($N_{90}P_{90}K_{90}$). Inputting compost on the basis of sewage sludge and mineral fertilizers (options 7 and 8) yields decreased compared to option 6 (ERU – 40 t/ha + $N_{10}P_{14}K_{58}$) and amounted to 54,7–56,9 t/ha, which is 23,3–25,5 more than the indicator of the control variant. In the conditions of research, the lowest crop of artichoke – 34,1 t/ha, in addition to the control variant, was obtained for the introduction of mineral fertilizers in the normal N60P60K60 (option 2). The number of tubers per plant in the conditions of the experiment ranged from 20 to 35, the average weight of tubers varied from 51,1 to 72,6 g in variations. The mass fraction of large bulbs of artichoke varied from 17% (option 1) to 47% (option 6). In particular, with the addition of sewage sludge (20–40 t/ha) and mineral fertilizers, their share increased from 31 to 47%, which is 14–30% more than the indicator of the control variant.

Conclusions. According to the results of the conducted researches, the introduction of sewage sludge under the Jerusalem artichoke significantly affects the productivity of agrocenosis, promotes an increase in the number of tubers under the bush, including large ones. The application of sewage sludge in the norm of 40 t/ha in combination with mineral fertilizers in the dose $N_{10}P_{14}K_{58}$ provides the yield of artichoke tubers on soddy-podzolic soils to 67 t/ha, which is 35,5 t/ha higher than the index of the control version without fertilization. The formation of the tuber yield significantly affects their number in the bush and the proportion of large (more than 70 g) (the tightness of communication is R^2 = 0,84–0,87).

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