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MELIORATION AS AN ESSENTIAL MEANS FOR AGRICULTURE DEVELOPMENT IN NON-CHERNOZEM ZONE OF RUSSIA

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The long-term rejection of comprehensive state support for agriculture development programs in the Non-Chernozem zone of Russia led to the bankruptcy of agricultural enterprises, the loss of 42% of agricultural land and the outflow of population from rural areas. The state of regional farming is gradually aggravated due to overgrowing of agricultural land with trees and shrubs, hidden degradation of soils and reduction of their effective fertility, depreciation and loss of efficiency of drainage systems, increased risks of climatic anomalies, etc. The growth of the region's heat supply (on average by 0.02°C per year) is generally positive, however, the risks of yield losses and climate anomalies are significantly increasing (droughts in some periods – by 18–87%; waterlogging during the harvest period — by 25%). Modern agromeliorative condition of agricultural land is unsatisfactory. More than 54% of farmland is subjected to regular waterlogging, at least 16–20% of the area – to secondary waterlogging. The share of unused arable land in the regions of the Non-chernozem zone currently ranges from 26 to 72%; from 42 to 58% of the area is subjected to overgrowing with trees and shrubs. According to monitoring data, only 8–17% of drainage systems provide the standard drainage regime, and more than 80% need major repairs and reconstruction. As a result of latent degradation, the humus content in the soils decreases annually by 0.01–0.03%, pH_{KCl}. – by 0.02–0.03 units, mobile compounds of phosphorus – by 4–8 mg kg^{-1}, potassium – by 10–20 mg kg^{-1}. Dispersion and migration of colloids in the upper horizon cause destruction of the structure, compaction, reduction of the range of active moisture, the structure water resistance by 3.5–4.8 times and water permeability of individual soil horizons by 1.3–2.7 times. Drainage reclamation in modern conditions leads to a decrease in crop losses during harvesting by 2.9 times (from 40 to 14%) and an increase in the economic productivity of potatoes by 72%, and profitability by 129%. Irrigation of vegetable crops during the acute arid period increases the yield of cabbage heads by 35.7–67.5 tons ha^{-1} and carrot roots by 9.1–26.7 tons ha^{-1}. The Section of Land Reclamation of the Scientific Council of the Agrophysical Research Institute proposed a program-targeted approach to the development of the ameliorative complex, which includes a set of measures for regulatory, scientific, personnel and production support.

Key words: reclamation, drainage system, irrigation, weather and climatic conditions, degradation, soil cultivation, adaptation, efficiency, productivity.