Abstract

In the article we developed the design principles and implementation of a complex model and optimized the design parameters of drainage. The study was based on the implementation of interconnected structural and technological forecasting simulation and optimization model blocks, which in turn allowed to justify the optimal design parameters and drainage considering multiple natural and agronomic conditions and reclamation facilities. Example of evaluating the performance of drainage on drained lands was made for the conditions of a real project, implemented on lands of agricultural holding “May Day” located within of drainage system “Ikva” in the Rivne region. For the object conditions (average decade formation conditions of the drainage flow module for growing perennial grasses, winter cereals and potatoes) the estimated duration of the growing season was 214 days (100%), of which the total duration of drainage was 60% and included different levels of efficiency: 39% – ecological, 15.5% – technological and 5.5% – economic. The duration of its critical operations (forming module drainage flow exceeds the design of its value) does not exceed 5%. Thus, this approach enables the assessment of drainage with predetermined or specified parameters in the construction or renovation of drainage systems on different levels of effectiveness. It can be effectively used in the overall complex predictive and optimization calculations to substantiate the design and parameters of agricultural drainage, taking into account the variability of natural agrotechnical and reclamation conditions of a real object.

Key words: agricultural drainage, complex model, effectiveness, parameters