

USING VARIOUS FORMS OF NITROGENOUS FERTILIZERS AT DECREASING THE ENVIRONMENTAL POLLUTION

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The results of the research point out to definite advantage of using the slow-acting carbamide-formaldehyde fertilizer (CFF) than the urea and ammonium nitrate at decreasing the pollution of environment by remains of artificial manure harmful for organism. It was ascertained that the use of slow-acting CFF is especially important in the conditions of salty soils with close laying of ground waters, trace place. It was revealed, that the great content of nitrates in the soil at carrying in the nitrogenous fertilizers like ammonium nitrate and urea causes the considerable losses of given element of feeding, parameters of which have the great extent. As a result, the number of problems of environment pollution take place, as the most danger is the great accumulation of nitrates in the soil. It should be noted, that nitrates are accumulated not only in the soil – grounds, ground waters, but in feed and food products higher than permissible norm and hence they get into organism of human and animals.

Key words: nitrogenous fertilizers, urea-formaldehyde fertilizer, carbamide-formaldehyde fertilizer (CFF), nitrates, amides, denitrification, humus, vegetation experiments, urea, ammonia nitrogen.

Introduction. It should be noted that the use of high rates of nitrogen fertilizers, exceeding the plants demand for the formation of planned yields, is accompanied by a significant accumulation of nitrogenous substances in the soil, water sources, and fodder food. In addition, as a result of denitrification and a number of other chemical reactions, there is a huge loss of nitrogen in the form of its incomplete oxides, which penetrate the atmosphere and pollute the environment with all the negative consequences that follow.

Methods of research. Vegetative and field experiments were carried out. The repetition of all the above types of experiments is fourfold. The plot area is 600 m² on a moderately saline light grey soil and 400 m² on a typical non-salted grey soil. Artichoke prickly placement patterns are 90x45x1 and 70x40x1, respectively, Valeriana officinalis L. 70x30x1, Artemisia leucodes Schrenk 60x25x1.

The results of research. The research results indicate that the content of ammonia and nitrate nitrogen depends on the phase of development. Higher rates of these nitrogen compounds are confined to the budding and flowering phases, and then they decrease, reaching a minimum in the seed ripening phase of the studied plants.

During the period of plant seeds ripening, the amount of residual nitrogen prevails significantly when urea is added to the plant than CFF. These data indicate that nitrification of ammonia nitrogen CFF is significantly less than urea nitrogen. As a result, the leaching of nitrates, especially in saline soils with close groundwater occurrence, occurs to a greater extent when urea is introduced than CFF. Due to the higher content of ammonia nitrogen in the soil when introducing CFF, the residual nitrogen (unused by the plant) decreases in relation to urea, which ultimately increases the efficiency of nitrogen on plants and reduces losses. The total amount of residual inorganic nitrogen composed of nitrates and ammonia is noticeably higher when used under the studied urea plants than CFF.

Based on these data, it can be assumed that nitrogen losses from urea as a result of denitrification and leaching occur to a greater extent when used under the urea plants under study than CFF. This indicates a certain advantage of using CFF than urea in reducing environmental pollution by harmful remains of the mineral fertilizers. Similar data on the content of ammonia and nitrate nitrogen in the soil were obtained under the conditions of field experiments laid on a typical non-saline sierozem.

As the data show, the content of ammonia and nitrate nitrogen is higher during reproductive development (budding, flowering, fruit formation) of the plants studied, and then it decreases, which is explained by increased nitrogen consumption by the plant on the one hand, and on the other its unproductive losses during the indicated developmental phases by the above mentioned plants. The results of our research indicate that the content of nitrates in soils in all terms of their determination is significantly reduced when entering into the soil CFF than urea.

Conclusion: Application under *Cynara scolymus* L., *Valeriana officinalis* L., and *Artemisia leucodes* Schrenk of CFF helps reduce environmental pollution by nitrates on a typical non-saline sierozem, especially under conditions of saline light sierozems with close groundwater deposition than ammonium nitrate nitrogen forms. CFFs contribute to an increase in the efficiency of nitrogen on plants and reduce the unproductive loss of nitrogen from the soil. The use of CFF contributes to the reduction of environmental pollution and the production of environmentally friendly products.