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INFLUENCE OF DIFFERENT TYPES OF FERTILIZERS ON BIOCHEMICAL INDICATORS OF GRAIN

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Abstract. Increasing protein production and improving other biochemical indicators is one of the most important problems caused by the development of livestock farming and a sharp increase in its productivity. The increase in the supply of mineral fertilizers, chemical ameliorants to agriculture, as well as constant attention to organic matter, green manure crops, makes it necessary to study the effect of their long-term systematic use on the yield and quality of products. At the same time, it becomes possible to establish optimal rates, methods and timing of fertilizer application, contributing to the maintenance of a positive balance of nutrients.
Keywords: fertilizers, grain quality indicators, soils, leached chernozems, gray forest soils, crop yield.

INTRODUCTION

According to literary sources, the protein deficit in feed rations for farm animals currently amounts to approximately 4 million tons. To cover the deficit that has arisen, it will be necessary to spend approximately 16 million tons of concentrated feeds such as oilcake, meat meal, etc. In connection with the tasks set to increase the livestock population, the protein deficit in feed crops may develop to even greater proportions. In order to resolve the protein problem, it will be necessary not only to increase the grain for livestock needs, but also to increase the protein content in feed crops by improving soil nutrition conditions. In this regard, fertilizers play a major role, as can be judged by the extensively published data of V.E. Torikov, O.V. Melnikov, I.V. Glebova, O.A. Gryaznova, V.N. Nedbaev, and others.

MATERIALS AND METHODS

Our studies on the effect of fertilizers on the biochemical parameters of corn were conducted on leached chernozem. Leached chernozem (variant 1) of this zone has a high potential fertility. A meter-thick layer of one hectare contains up to 408 tons of organic matter, 21.5 tons of total nitrogen, and 7.5 tons of total phosphorus. There are few mobile forms of phosphorus, which can be judged by the high responsiveness of crop plants to the application of phosphorus fertilizers, but the maximum responsiveness of plants is manifested when NPK is applied, and when phosphorus and nitrogen are applied in equal quantities or there is more phosphorus than nitrogen. Leached chernozems contain less humus than deep and slightly leached ones (6-9%), are more washed and leached, so they are somewhat lower in their production indicators. These soils need to be phosphorized and even occasionally limed. It is good to add organo-mineral mixtures, as well as superphosphate after manure. These soils are widely used for sowing grain and industrial crops. Here they occupy watershed spaces and gentle slopes. In addition, leached chernozems are found in combination with powerful and slightly leached ones, occupying the lower parts of gentle slopes, as well as the northern slopes of plateaus and gentle gullies, and hollows.

RESULTS AND DISCUSSION

The studies on the effect of fertilizers on the biochemical parameters of corn grain were conducted on the following backgrounds:

1) control without fertilizers;
2) N90P90K90 before sowing;
3) N60P60K60 for plowing, N30P30K30 as top dressing;
4) experimental variant manure 20 t

+ N20P70K10.

Fertilizers were applied under fall plowing, nitrogen in the form of ammonium sulfate, phosphorus in the form of superphosphate and potassium in the form of potassium chloride. The experiment was laid out using the paired method. The plot size was 500 m2 with three repetitions.

Pre-sowing soil cultivation for corn consisted of fall plowing to a depth of 20-22 cm, early spring harrowing in order to close the moisture. The plowing of fallow land in a unit with a harrow was caused by excessive soil compaction and was carried out to a depth of 12-15 cm.

Corn crop care consisted of pre-emergence and post-emergence harrowing, and two-way cultivation in two directions. Such soil treatment made it possible to maintain the upper soil layer in a loose state, thereby saving money from excessive losses due to evaporation.

The experimental plots with corn were harvested manually, and the yield was recorded by weighing the cobs from the entire accounting area.

The maximum yield and feed unit output, a higher percentage of protein and fat were obtained with the combined application of mineral and organic fertilizers corresponding to 120 kg of NPK. Against the background of mineral fertilizers applied alone, a higher percentage of protein was obtained with the application of 2/3 of NPK under plowing and 1/3 - in top dressing.

Phosphate flour has a large number of useful properties. It contains: phosphorus oxide - from 19 to 30%; silicon - 18%; calcium - 30%; magnesium - 2%. In addition, the flour contains a complex of microelements such as CuO, F2O3, Al2O3, SO2, ZO2. During use, the powder has the following positive effects on plants: root formation; stimulation of tillering; accelerated growth; winter hardiness; increased yield. Phosphorus flour has increased water resistance. Phosphorus flour has a long-term effect. It can be used once every 4-5 years.

CONCLUSION

The results of the experiments allow us to draw the following conclusions:

1. The applied fertilizers increased the protein content in corn grain by 2-2.2% compared to the control.
2. The maximum percentage of protein and fat in corn grain was obtained with the combined application of organic and mineral fertilizers corresponding to 120 kg per ha of NPK.
3. A higher percentage of starch was obtained with the application of 90 kg of NPK under plowing.

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