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YIELD OF CORN GRAIN AT VARIOUS FORMS AND RATES OF PHOSPHORUS FERTILIZERS ON THE UNWASHED AND WASHED OFF TYPICAL GRAY SOILS

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Abstract:

This article describes the influence of the forms and rates of phosphorus fertilizers on the corn yield in the unwashed and washed off typical gray soils of the Zerafshan Valley. Studies have shown that when cultivating corn for grain, on non-washed-out soils, the optimal rate of fertilizers $N_{240}P_{120}K_{100}$ was determined with a grain yield of 6.82 t/ha, for washed away - $N_{240}P_{150}K_{100}$ and a grain yield of 5.81 t/ha.

Keywords: Zarafshan valley, typical gray soil, unwashed and washed off soil, shape and rate, phosphorus fertilizers, corn, yield

1.INTRODUCTION.

In the world, special attention is paid to the development of agricultural technologies for the cultivation of agricultural crops, taking into account their biological characteristics, soil and climatic conditions to meet the needs of the population for food, industry - for raw materials and livestock - for feed. Corn (Zea mays L.) in terms of area in the world takes the third place after wheat and rice, in the group of forage crops - the first place. Today, the area of corn in the United States is 22.5 million hectares, China - 20.6 million hectares, Brazil - 11.8 million hectares. According to FAO, in the structure of crops, the area of corn relative to wheat in the United States is 123%, Australia is 63%, France is 43%, Germany is 70%, Russia is 3.5%, and the average yield is 7-10 t / ha.[1]

When growing corn, as the main and secondary crop, by improving the system of phosphorus nutrition, the balance of nutrients in the soil is optimized, a high yield of grain and green mass is obtained, the provision of food to the population, industry with raw materials and animal husbandry with high-grade (nutritious) feed. In this direction, scientific research on the impact of the use of new fertilizers developed on the basis of phosphorites, together with nitrogen and potash mineral fertilizers, on the growth, development and productivity of corn, as well as the development of an optimal technology for their use, is relevant.

In the Republic of Uzbekistan for 2018, when placing agricultural crops, for corn as a valuable grain and fodder crop, 138.5 thousand hectares of land were allocated and for the first time 1210.9 thousand tons of corn grain were obtained. At present, in the Republic, the average yield of corn for grain is 35-45 c / ha. However, as a result of the application of advanced innovative technologies, widely using existing opportunities, this indicator can be further increased when cultivating corn. By improving agricultural technology, studying the phosphate regime, which has an important role in the growth, development and formation of the crop, optimizing the needs of plants through the use of solid and liquid forms of fertilizers is of great theoretical and practical importance [2].

In the world, in order to increase the yield of grain and green mass of corn, a number of scientific studies are being carried out to improve the technology of using mineral fertilizers, in particular, in the following priority areas: determining the effect of the rates and timing of the introduction of solid and liquid forms of new phosphorus fertilizers on the yield of corn, sown as the main and re-culture; development of technology for using suprephos as the main phosphorus fertilizer in the production of grain and green fodder mass of corn.

In the conditions of the Zeravshan Valley, on typical gray soils with different degrees of erosion, a complex of scientific studies to study the effectiveness of the use of phosphorus fertilizers on corn of the main and stubble crops is relevant.

[1] [1]http:// www.usda.gov; http:// www.caas.cn/en

2.RESEARCH METHODOLOGY.

We have developed a scientific and practical basis for the formation of the mass and quality of corn for grain, with the introduction of various phosphorus-containing fertilizers, as well as the effect of phosphorus fertilizers on the productivity and quality of corn grain of the Korasuv-350AMV hybrid. The experiment is schematically shown in Fig. 1. Studies were carried out with a zoned hybrid of maize Korasuv-350AMV on washed and unwashed soils. The experiment was carried out in 4-fold repetition, with a plot area: total - 112 sq.m. and accounting - 86 sq.m. The objective of the study was to establish the influence of the norms and forms of phosphorus fertilizers on the yield and quality of corn grain.

In the study, field experiments, taking soil and plant samples, agrochemical analyzes, biometric measurements, phenological observations were carried out on the basis of generally accepted methods and methodological manuals - "Methods of agrochemical, agrophysical and microbiological studies in irrigated cotton regions", "Methodological recommendations for conducting field experiments with corn ", variational statistical analyzes -" Methodology of field experiment "(BP Dospekhov).

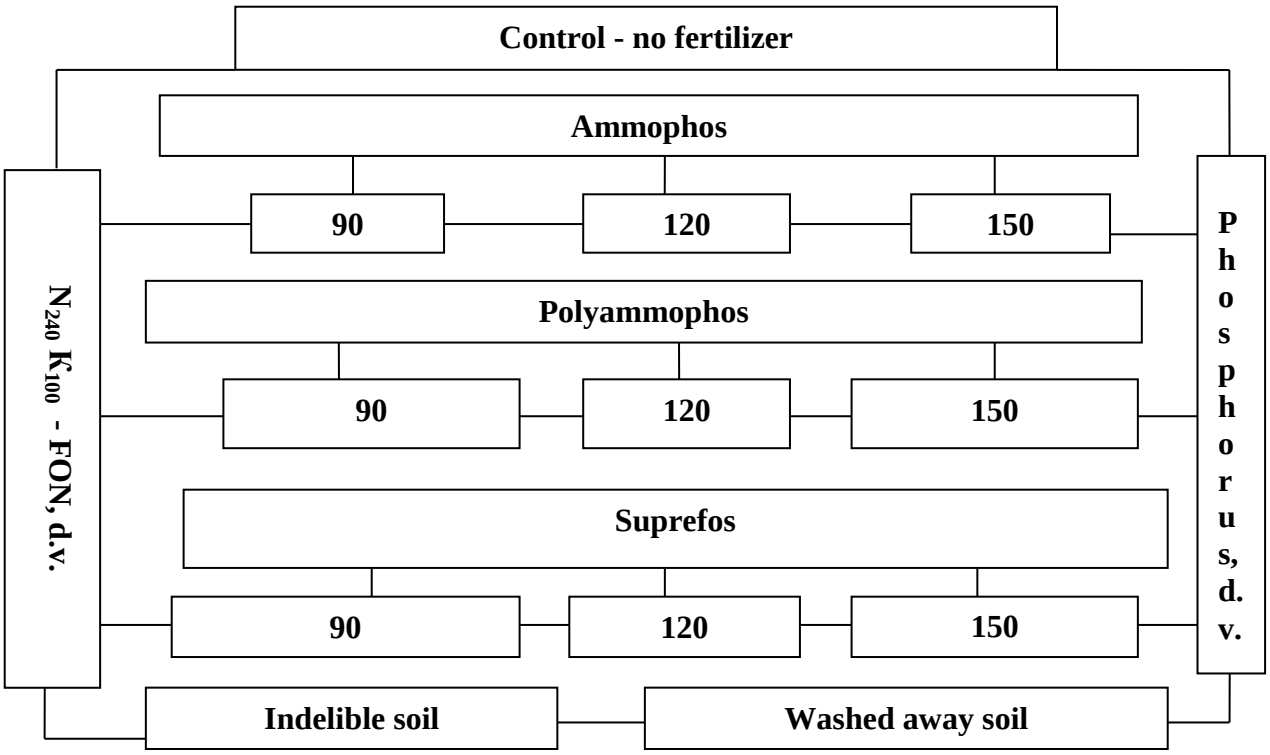

Fig. 1. Scheme of the experiment. Development of scientific and practical foundations for the formation of mass and quality of corn for grain when applying various phosphorus-containing fertilizers.

The growth and development of corn, depending on the growing conditions and characteristics of the variety and hybrid, varies greatly.

To obtain high yields of grain, general ideas about its relation to external factors are not enough. In order to grow high grain yields, it is necessary to deeply study in each specific region, on each hybrid and variety, what kind of soil and climatic conditions, at what age of plants, at what stage of development, purposefully form the yield and quality of corn.

3.RESEARCH RESULTS AND THEIR DISCUSSION.

In our studies, the increase in the phosphorus norm based on the nitrogen-potassium background (N240K100) to 150 kg / ha a.i. and the studied phosphorus fertilizers (ammophos, polyammophos, suprefos) increase the grain yield of corn by 23.9-25.8%. With the introduction of phosphorus at a rate of 120 kg / ha, in all forms of phosphorus fertilization, the yield of corn against the background of N240K100 increases compared to the background by 23.1-24.6%. The difference in yield when applying phosphorus 120 kg / ha and 150 kg / ha was insignificant, it was only 0.5-0.8%, but these figures were within the experimental error (table 1).

Table 1

Yield of corn grain with different forms and rates of phosphorus fertilizers on unwashed and washed off soils. Hybrid Korasuv-350AMV, t / ha

№	Experience options	Grain harvest	
		indelible soil	washed away soil
1	Control - no fertilizer	2,53	1,27
2	$N_{240}K_{100}$ – Fon	5,53	4,53
3	Fon + P_{90} ammophos	6,44	5,20
4	Fon + P_{90} polyammophos	6,57	5,35
5	Fon + P_{90} suprefos	6,41	5,21
6	Fon + P_{120} ammophos	6,81	5,57
7	Fon + P_{120} polyammophos	6,82	5,59
8	Fon + P_{120} suprefos	6,79	5,46
9	Fon + P_{150} ammophos	6,85	5,91
10	Fon + P_{150} polyammophos	6,88	5,81
11	Fon + P_{150} suprefos	6,82	5,78

4.RESULTS.

Thus, the structure of the yield and the grain yield of the Korasuv-350AMV corn hybrid in the conditions of washed-out and unreached typical sierozem depends on the forms and norms of phosphorus fertilizers.

When cultivating corn for grain, as the main crop, on unwashed soils, the optimal rate of mineral fertilizers was determined - N240P120K100, for washed off soils - N240P150K100, when growing corn, it has been proven that a grain yield of 5.81 t / ha on washed soils and 6.82 t / ha - on unwashed.

The grain yield increased with the introduction of phosphorus fertilizers based on nitrogen-potassium background. The most optimal phosphorus norms for corn grain turned out to be 120-150 kg / ha in the form of ammophos and polyammophos for washed-out and non-washed typical serozem soils.

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