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EFFECTS OF USING NON-TRADITIONAL MINERAL RAW MATERIALS ON WHEAT GROWTH AND DEVELOPMENT IN DRYLAND AREAS

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Abstract: This article presents the results of an experiment conducted in order to determine whether bentonite, which is considered as a source of microelements from non-traditional mineral raw materials, and its use in shelling and foliar feeding of grain crops grown in dry conditions, on growth and grain formation.

Keywords: Bentonite, wheat, fertility, ear length, dryland, cover crops, foliar feeding, suspension.

The size of the irrigated farming areas in the republic is 8-9% of the total land area, and these existing irrigated lands are the golden fund of the republic.

According to the FAO, in 86 countries from 2006 to 2018, the scale of use of water resources in agriculture also increased.

Including Uzbekistan, consuming 169% of its water reserves, it has reached a critical level in relation to water resources.

Scientific justification of the ways of rational use of land and water resources, development of technologies for effective use of land and water resources, based on the different soil and climate conditions of the republic, maintaining and increasing soil fertility, and ensuring the population's demand for food products. and the situation requires making suggestions and recommendations for production.

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It has been established that agro-ores have a wide influence on physiological biochemical processes in plants. In particular, it increases the germination capacity of seeds by 10-12%, the amount of chlorophyll by 2.5-3.0 times and increases the productivity of photosynthesis. When bentonite slurry is used as a fertilizer-meliorant, the yield of cotton is 2.5-9.3 tons/ha, the mass of alfalfa is 78.4-98.7 tons/ha, the yield of wheat is 4.4-5.1 tons/ha, and the yield of barley is 5 ,5-7.1 t/ha, mash grain yield 1.9-3.5 t/ha, sugar beet root yield increased by 18%.

The main goal of the application of any new agrotechnical measures in the care of agricultural crops is to improve plant growth, accelerate development and increase productivity. In recent years, as a result of consecutive planting of cotton and winter wheat crops in the same field, insufficient supply of mineral and organic fertilizers in the agricultural sector of our republic, the fertility of the soil is decreasing, and the amount of nutrients in it is decreasing year by year. This, in turn, causes a decrease in crop yield [3].

It is advisable to use the method of feeding agricultural crops from the leaves in the absence of moisture in the soil, low or high temperature, reduced absorption of nutrients in the soil and other adverse conditions. there are limitations in their full use, especially for micronutrients in non-chelated form. Nitrogen is better absorbed [5].

In the cultivation of winter wheat, it is advisable to use the method of feeding the plant from the leaves in addition to the roots. Foliar feeding is effective in growing winter wheat, even under conditions of high grain yield [1].

In winter wheat care, if newly produced liquid nitrogen fertilizers are used together as a suspension, the grain quality of winter wheat has a positive effect [2].

Foliar feeding is one of the agrotechnological measures to improve plant metabolism and photosynthetic activity, to eliminate the nutrient deficiency in the soil during the harvest of winter wheat in all dry areas of the republic.

In dry areas, in the years heavily affected by various rust diseases and pests, during the tuberting and earing stages of winter wheat, spraying the grain crop with 0.2-0.3 l/ha of 3 and 5 percent suspensions containing fungicides against diseases and insecticides against pests, depending on the amount of precipitation 4 It provides an increase of 0-7.0 ts/h and saves resources by 25-30% (4).

In the literature data given above, it is stated that bentonite from non-traditional agro-ores contains many microelements and can be used in various fields of agriculture. Also, since bentonite and other agro-ores are structurally rich in microelements and are high-level adsorbents, and in terms of their high absorption capacity, it is important to determine that the shelling of crop seeds from a solution of their various standards has a unique positive effect.

Field experiments were conducted in 2021-2023 at the farm "Umrbek" located in Nurota district. The experimental field is located in a hilly region of arable lands. The amount of humus in the plow layer (0-30 cm) of dry gray soils is 0.21%, total nitrogen - 0.020%, total phosphorus - 0.16%, nitrate nitrogen - 11.9 mg/kg, mobile phosphorus - 10.06 mg/kg kg and exchangeable potassium is 72.1 mg/kg.

Experiments were carried out in four replicates, and the replicates were placed in one tier. In the years of the experiments, the Surkhak-5688 variety of wheat, recommended for cultivation in dry conditions, was planted at the rate of 100-110 kg per hectare.

In these experiments, seeds of bentonite clay powder were coated with bentonite clay powder at the rates of 30, 40 and 50 kg/t in the cultivation of grain crops, and 4, 6 and 7 kg and 1-2 kg/ha of mineral fertilizers were used in foliar feeding with urea, depending on the development phases. The effect of using a suspension prepared together with bentonite clay powder 3 times during the season on plant growth and development and productivity was studied.

In the experiments, the field germination of wheat seeds depending on the amount of rainfall and the rates of coating the seeds with bentonite clay powder was averaged over 3 years of the control (absolute control with seed without coating and no foliar feeding, seed without coating and foliar feeding only with urea and seed without coating and only urea and foliar feeding). control fed with bentonite suspension) 74.3%, 75.5% and 75.2% respectively in options, 84.7% and 84.8% in 30 kg/ha option, 88.6% in 40 kg/ha option and 88.3%, 85.2% and 85.3% in the 50 kg/ha option. Foliar

feeding during the growing season had an effect on the number of wheat stems at the end of the application period (Fig. 1).

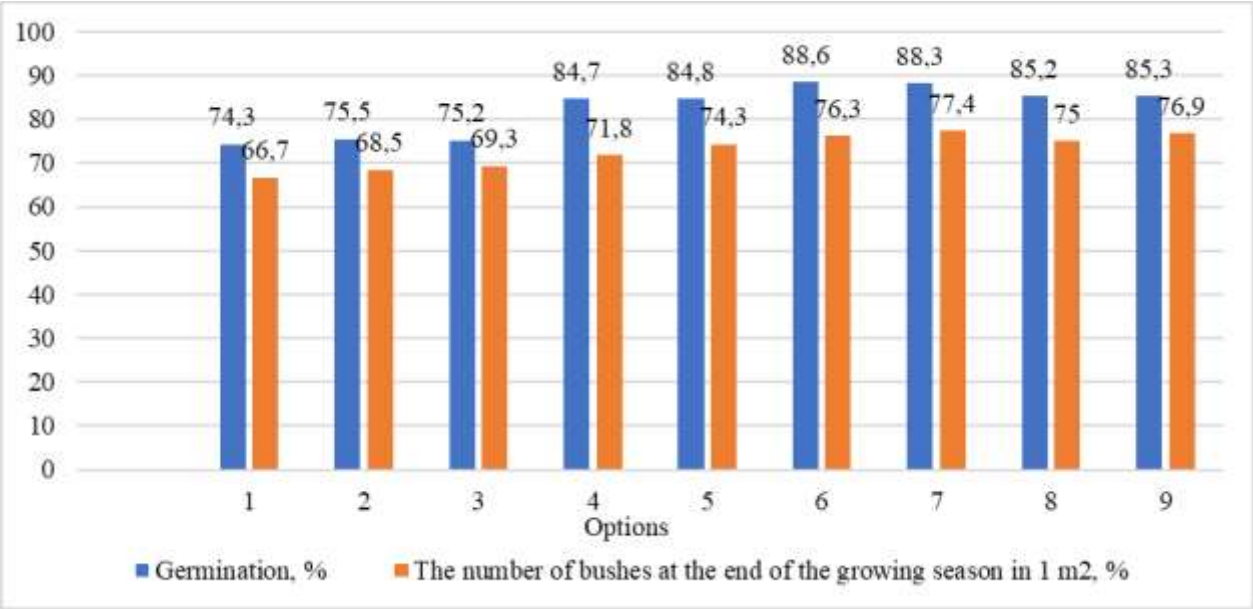

Figure 1. Effect of bentonite clay powder on wheat seed germination and seedling thickness

In the control variants of the experiments, the average length of spikes was 5.2, 6.8 and 8.2 cm, respectively. Before planting, 30, 40 and 50 kg/t of bentonite clay were used for coating the seeds, and in the variants fed only with urea suspension, 8, It was 0, 8.7 and 8.5 cm. It was found that this indicator was 8.8, 9.2, and 8.9 cm in the variants that used bentonite clay powder together with urea in foliar feeding under these conditions.

Similarly, there were changes in the number of grains per spike, i.e., the number of grains per spike was 20.3, 28.2, and 30.5 in the controls, while 30, 40, and 50 kg/t of bentonite clay were used in seed coating before planting, and leaf 26.4, 30.0, and 28.2 units in the variants fed only with urea suspension, and 4.8, 2.9, and 1.9 in the variants that used bentonite clay powder together with urea in foliar feeding. it was found that more grains were formed per grain (Figure 2).

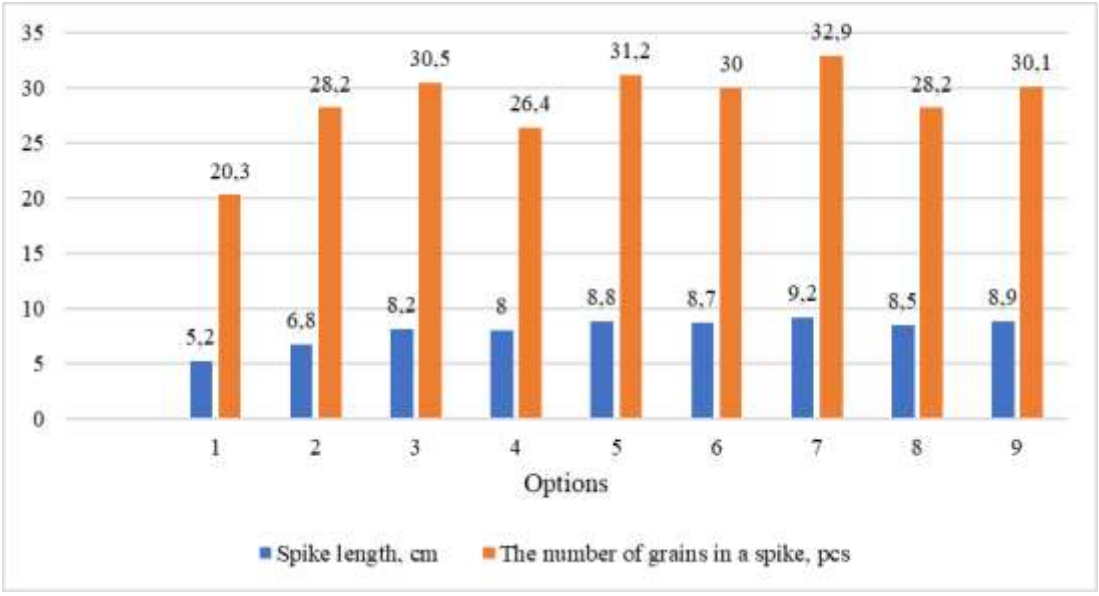

Figure 2. Effect of bentonite clay powder on wheat spike length and number of grains per spike

Based on the results of three years of field experiments, it can be concluded as follows:

1. Hulling with bentonite clay powder in various mediums, especially when bentonite clay powder is used at the rate of 40 kg/t in hulling and 4:1 ratio of bentonite clay powder to urea solution

in foliar feeding, foliar feeding 3 times during the season wheat in dry lands of Navoi region It was found to be the most suitable agrotechnical measure for cultivation.

2. It was found that application of bentonite clay powder at the rate of 40 kg/t and foliar feeding with bentonite and urea suspension in wheat cultivation in dry conditions had a positive effect on wheat fertility and the formation of crop elements.

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