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INFLUENCE OF NON-TRADITIONAL AGRO-ORES ON THE GROWTH AND DEVELOPMENT OF SOY CROP

A. Abdiev

Candidate of Agricultural Sciences, docent of the Institute of Irrigation and Agrotechnology

N. Amirkulova

Foundation doctoral student, Karshi Institute of Irrigation and Agrotechnology

B. Kholliyeva

Independent Researcher, Karshi Institute of Irrigation and Agrotechnology

Annotation: The article examines the effect of sulfur bentonite and sulfur carbamide fertilizers on the growth and development of soybeans planted as a repeated crop.

Key words: bentonite clays, agrochemical indicators, sulfur-urea fertilizers, phenological observations.

It's no secret that today, providing the population with food products remains the most urgent issue for the countries of the world. Even in developed countries, the price of such gifts increases 2-3 times a year. Population growth, limited land and water resources used in agriculture, especially frequent natural disasters make the situation even more complicated. Therefore, serious attention is being paid to the development of intensive cultivation agrotechnologies, which ensure a high yield from agricultural fields, using the available opportunities in our country.

Scientifically determining the need for mineral fertilizers, taking into account the biological properties of agricultural crops, productivity, soil fertility and agrochemical parameters, will dramatically increase the effectiveness of mineral fertilizers.

Bentonite clay, which is considered one of the non-traditional agro-ores, can be used as fertilizers in agriculture due to the level of provision of macro- and micro-elements in the soil in optimal proportions. Microelements have a high agrochemical and physiological significance, they improve the exchange of substances, help the optimal passage of physiological and biochemical processes, have a positive effect on the process of chlorophyll synthesis and increase the speed of photosynthesis. Under their influence, plants become more resistant to fungal and bacterial diseases, one of the unfavorable environmental conditions is the lack of moisture, temperature rise or fall.

Sulphur as a fertilizer improves the root system of crops. It also acts as an antiseptic, prevents the occurrence of mold and root rot diseases, and has a positive effect on the good formation of vegetative mass.

According to Z.M. Zakirov, M.M. Mirsaidov, the largest bentonite deposits in Uzbekistan are located in southern Aqrabot, Aktash, Maidan, Guzor, Yakkabog, Pachkamar, Dehkhanabad and Hovdak. Bentonite turbidites in the southern part of the republic are characterized by their rich composition of macro and microelements and the presence of many minerals, zeolite residue, feldspar mica (Zokirov Z.M., Vnouchik G.B).

More than 40 small bentonite minerals are found in nature, differing from each other in physico-chemical properties and chemical mineralogical aspects.

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Existing non-traditional mineral raw materials are significant for their high efficiency in replacing some missing mineral nutrients in agriculture or as additional nutrients due to their high availability and low cost.

Research The effects of sulfur bentonite and sulfur carbamide fertilizers on crop growth, development and productivity were studied on the basis of the use of sulfur bentonite and sulfur carbamide fertilizers in the soybean crop planted as a repeated crop after winter wheat in the experimental area of the Southern Agricultural Research Institute.

In the study, the "Orzu" variety of soybean, suitable for the soil and climate conditions of the region of Kashkadarya region, with a high grain yield, was planted as a repeated crop.

Field experiments were placed in separate plots in 1 layer for three types of crops, the number of options was 14, and they were conducted in 3 replications. The number of patches in the experiment was 42. The estimated area of each plot is 180 m², that is, the length is 50 m and the width is 3.6 m.

Studies have included preliminary phenological observations from repeated soybean crops on the effects of sulfur bentonite and sulfur carbamide fertilizers on crop growth and development. According to this, the results of the experiment in control (without fertilizer) and traditional (options 1-2), respectively, germination 4 days, formation of 2-3 leaves 3 days, tillering 14 days, flowering 21 days, podding 34 days, full ripening It was 96 days.

Table 1

Effects of Sulphur Bentonite and Sulphur Carbamide Fertilizers on Soybean Plant Growth Period

	Sulfur application method	Planting day	Germnation (day)	Formation of 2-3 leaves, (day)	Budding, (day)	Flowering, (day)	Beaning, (day)	Full ripeness, date.
1	Control (No Fertilizer)	June 2	4	3	14	21	34	96
2	Traditional	June 2	4	3	14	21	34	96
3	Bentonite 10% + 8 kg S	June 2	4	3	15	22	36	96
4	Bentonite 10% + 12 kg S	June 2	4	3	15	22	36	96
5	Bentonite 10% + 16 kg S	June 2	4	3	15	22	36	96
6	Bentonite 20% + 8 kg S	June 2	4	3	15	22	36	96
7	Bentonite 20% + 12 kg S	June 2	4	3	15	22	36	96
8	Bentonite 20% + 16 kg S	June 2	4	3	15	22	36	96
9	Bentonite 30% + 8 kg S	June 2	4	3	15	22	36	96
10	Bentonite 30% + 12 kg S	June 2	4	3	15	22	36	96
11	Bentonite 30% + 16 kg S	June 2	4	3	15	22	36	96
12	Carbamide + 8 kg S	June 2	4	3	16	23	37	96
13	Carbamide + 12 kg S	June 2	4	3	16	23	37	96
14	Carbamide + 16 kg S	June 2	4	3	16	23	37	96

It was also used in the (3rd, 4th, 5th, 6th, 7th, 8th and 9th) versions of the research (Bentonite with 10% + 8 kg S); (Bentonite with 10% + 12 kg S); (Bentonite with 10% + 16 kg S); (Bentonite with 20% + 8 kg S); (Bentonite with 20% + 12 kg S); (Bentonite with 20% + 16 kg S); (Bentonite 30% li + 8 kg S) according to the parameters, germination was 4 days, formation of 2-3 leaves was 3 days, budding was 15 days, flowering was 22 days, beaning was 36 days, full ripening was 96 days.

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Table 2

Effects of Sulfur Bentonite and Sulfur Carbamide Fertilizers on Soybean Plant Growth Period

	Sulfur application method	August 01		August 15		September 01		September 15		
		Plant height, cm.	Number of pods, pcs.	Plant height, cm.	Number of pods, pcs.	Plant height, cm.	Number of pods, pcs.	Plant height, cm.	Number of pods, pcs.	Number of branches, pcs.
1	Control (No Fertilizer)	15,3	3,1	23,0	16,1	41,4	21,1	41,8	35,5	2,0
2	Traditional	16,1	3,2	27,4	19,2	52,2	26,6	55,8	47,4	2,5
3	Bentonite 10% + 8 kg S	19,0	3,8	32,2	22,5	67,7	34,5	75,8	64,4	3,4
4	Bentonite 10% + 12 kg S	20,8	4,2	35,3	24,7	74,2	37,8	86,1	73,2	3,9
5	Bentonite 10% + 16 kg S	22,8	4,6	38,8	27,2	81,4	41,5	91,2	76,3	4,0
6	Bentonite 20% + 8 kg S	20,1	4,0	34,2	23,9	71,7	36,6	80,3	68,3	3,6
7	Bentonite 20% + 12 kg S	22,0	4,4	37,4	26,2	78,6	40,1	91,2	77,5	4,1
8	Bentonite 20% + 16 kg S	24,2	4,8	41,1	28,8	86,3	44,0	96,7	78,6	4,2
9	Bentonite 30% + 8 kg S	21,1	4,2	35,9	25,1	75,3	38,4	84,3	71,7	3,8
10	Bentonite 30% + 12 kg S	23,1	4,6	39,3	27,5	82,6	42,1	95,8	81,4	4,3
11	Bentonite 30% + 16 kg S	25,4	5,1	43,2	30,2	90,7	46,3	101,5	86,3	4,6
12	Carbamide + 8 kg S	21,9	4,4	37,3	26,1	78,3	39,9	87,7	73,5	4,0
13	Carbamide + 12 kg S	24,1	4,8	40,9	28,6	85,9	43,8	96,2	81,8	4,4
14	Carbamide + 16 kg S	26,4	5,3	44,9	31,4	94,3	48,1	105,6	89,8	4,8
Minimum		***15,3***	***3,1***	***23,0***	***16,1***	***41,4***	***21,1***	***41,8***	***35,5***	***2,0***
Maximum		***26,4***	***5,3***	***44,9***	***31,4***	***94,3***	***48,1***	***105,6***	***89,8***	***4,8***
Average		***21,6***	***4,3***	***36,5***	***25,5***	***75,8***	***38,6***	***85,0***	***71,8***	***3,8***

Initial observations were made on August 1 after repeated planting of soybeans in the experimental field. When the average results of the options were analyzed, the lowest indicator was the plant height of 15.3 cm, the number of pods was 3.1, and the highest result was carbamide + with 16 kg S in the 14th variant, it was found that the height of the plant was 26.4 cm, and the number of pods was 5.3.

The next observation of the growth of the plant in the research was carried out on August 15, and the optimal results were in the 13th option with carbamide + 12 kg S and in the 14th option with carbamide + 16 kg S, plant height was 40.9 and 44.9 cm, respectively, and the number of pods was 28.6 and 31.4 pieces, while the lowest indicator was the plant height of 23.0 cm, the number of pods was 16.1 pieces in option 1 without control fertilizer.

In field experiments, the next period of phenological observations showed differences between variants by September 1. When analyzing the average results obtained from the study, in option 1 without control fertilizer, the plant height was 41.4 cm, and the number of pods was 21.1 units, while in option 14 with carbamide + 16 kg S, the plant height was 94.3 cm, and the number of pods was found to be 48.1 piece.

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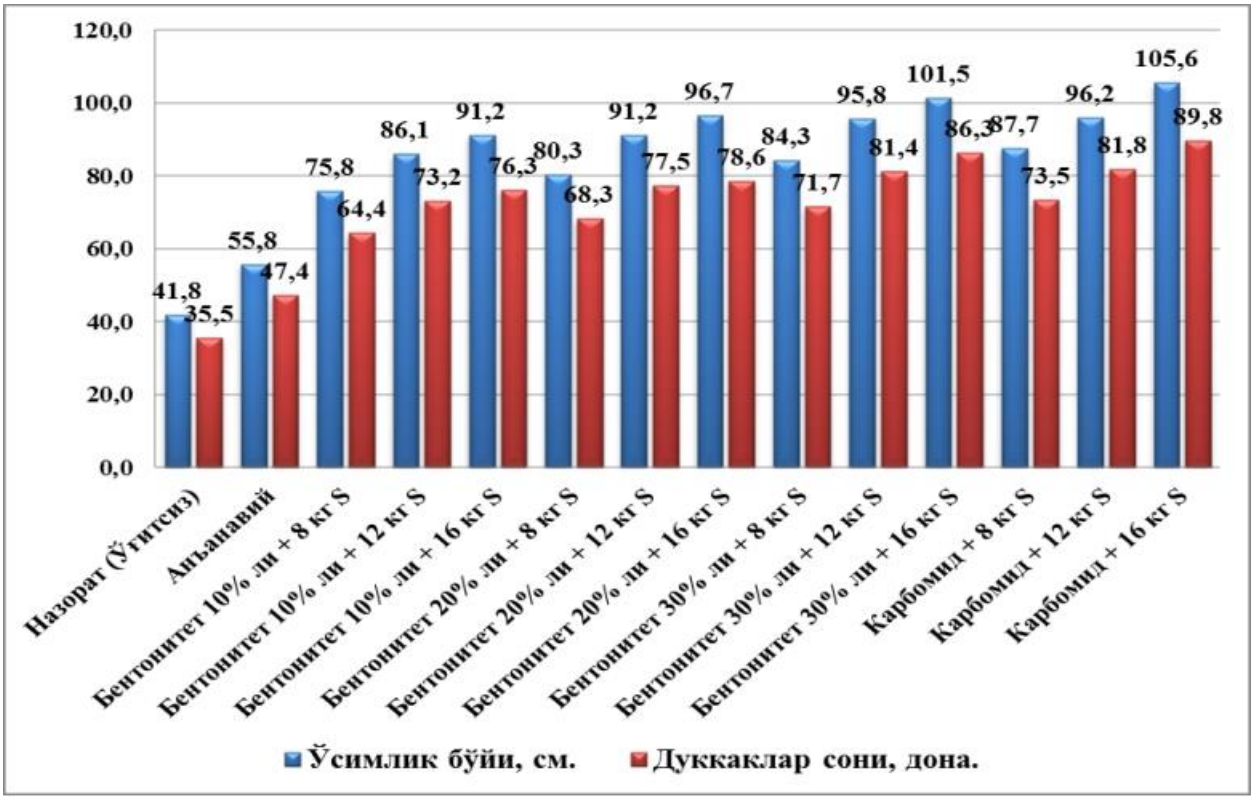

1 - picture. Effect of sulfur bentonite and sulfur carbamide fertilizers on plant height and number of pods in a recurrent soybean crop.

In the research, in the next period of phenological observations, by September 15, the difference between the variants was clearly noticeable. That is, the optimal plant growth (105.6 cm) was observed in the 14th variant of the experiment, where carbamide + 16 kg of S sulfur was used. In the 13th variant of replanted soybean with carbamide + 12 kg S (plant height 96.2 cm, the number of pods 81.8 pieces, the number of harvested branches 4.4 pieces), the plant height compared to the 14th option, where carbamide + 16 kg S sulfur was used 9.4 cm, the number of pods is 8, and the yield is 0.4 less.

The following conclusions were made regarding the study of the effect of sulfur bentonite and sulfur carbamide fertilizers on the growth and development of the soybean crop studied in the conducted research:

- as a result of the use of sulfur bentonite and sulfur carbamide fertilizers, the seeds retain moisture in the environment, and the use of macro- and micro-fertilizers ensures healthy seedlings.

- in the case of bentonite 30% + 12 kg S in the repeated soybean crop, the germination period is 4 days, the formation of 2-3 leaves is 3 days, the tillering period is 15 days, the flowering period is 22 days, the podding period is 36 days, and the full ripening period is 96 days. In conclusion, it was found to be the most acceptable result in the experimental version.

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