

DETERMINATION THE EFFECT OF NITROUS FERTILIZERS ON INTENDED FOR SILO PROCESS OF MAIZE WHEN INTERCROPPING SOYBEAN WITH MEIZE HYBRIDS AS A REPEATED CROP

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INTRODUCTION

Relevance of the topic. In recent years, special attention has been paid to increasing the land fund and increasing its productivity in Uzbekistan. In recent years, 15-25 thousand/ha of new land has been developed and 40-50 thousand/ ha of land has been improved. But the size of the land is limited, and due to the lack of water, the possibility of adding additional areas to the agricultural cycle is also limited.

Therefore, it is necessary to determine the methods of using the existing land fund. Serious attention is paid to the development of grain production in our country . In our republic, this wheat is not planted on large areas, in watery lands, this wheat is planted on 1,000,000 hectares of land. In order to grow a second crop using the lands planted with this grain , in several different directions scientific works are carried out .

As repeated crops, crops such as maize, wheat, sorghum sudan grass, oats, and soybeans can be planted. In order to grow high -yield fodder, which is required for animal husbandry, sowing maize and soybean as a repeated crop is an important technological event. Maize is a high - yielding plant, which contains enough nutrients, but does not meet the requirements of protein and medicine. Soybean is a nodule - rich plant, and foods prepared from it contain a lot of nodules and a small number of units of food. That's it If both plants are planted together, it is possible to grow food that meets the quality requirements.

The purpose of the scientific work is to determine the effect of nitrogen fertilizers on the yield of silage maize in the intercropping of maize and soybean hybrids as a repeated crop.

The scientific novelty is that a hybrid of maize and soybeans can be planted in the fallowed fields to produce grain and silage crops. The effect of nitrogen fertilizer rate was studied and an alternative rate was determined. In this context, the growth, development, and characteristic formation conditions of the crops involved in this sowing were studied.

The practical importance of the work - as a repeated crop, hybrids of maize and oats are planted with Uzbekistan - 2 varieties of soybeans. When the rate of fertilizers is $N_{150}P_{90}K_{60}$, favorable conditions are created for the cultivation of high grain and silage crops and the efficiency of land use increases.

History. Sowing maize and soybean seedlings in combination. It is necessary to create new intensive technologies in agriculture in order to satisfy the ever - increasing demand of the population for food and to grow high - productivity feed for livestock. In the cultivation of field

crops, it is necessary to research and develop technological activities that provide a high-quality harvest, make full use of irrigated land, and increase soil fertility. When plants are planted together, their underground and above-ground parts (organs) have different requirements for external factors, they use different light and soil fertility.

Emphasizing the advantage of sowing crops in combination, it is recommended to plant this grain with rye, barley with oats, oats with vicia, cabbage with spring rye [1, 9] According to archeological and ethnographic data, a lot of scientists called intercropping as the first method in the development of agriculture, mixed crops were obtained from naturally growing plants [3, 6]

According to these scientists, it is always dangerous when sowing the same crop, because the yield is low in unfavorable conditions, or according to the information of O.A.Bragina [7]. 240-270 kg of mineral fertilizer per hectare on the sierozem soils of Kazakhstan 600-700 c/ha of silage was obtained when the ratio of NPK was 1:0.7:0.5).

Experiments carried out in Ukraine [10], maize was planted in combination with maize, beans, soybeans, mung bean, grass pea (*Lathyrus sativus*) and chickpea. The best yield is obtained when maize is planted in combination with soybeans. The amount of digestible protein in the diet increased by 29 c/h compared to the control option by 157 c/ha.

According to the results carried out in Ukrainian maize RI, it was produced in different ways did not increase, but protein content increased by 32.5 % [11, 10, 6].

According to the data of A.I.Tyutyunnikov and V.M.Fadeev [12] Maize contains 6.0 % protein when it is grown in pure form, and 6.8% when it is added with soybean. It is necessary to create technologies for their cultivation when sowing field crops. Sowing norms, sowing methods, watering, feeding, etc. When crops are planted in addition, the conditions of their growth and development change, so the technological measures recommended for pure sowing should be considered. It is recommended to plant mackerel in wide rows, double rows, and interspersed with soybeans.

When choosing a sowing method, soil conditions, variety characteristics were taken into account [8].

METHODS AND MATERIALS

Scientific research work was carried out in 2012-2015 at the experimental and educational farm of Tashkent State Agrarian University.

Soil of the experimental farm is a typical soil that has been irrigated for a long time. A typical sierozem soil contains 1.0-1.5% humus, about 0.058-0.089 % nitrogen, about 0.141-0.184% phosphorus and 0.754-0.843 % potassium. This indicates that the microelements that the plant uses during the growing season are insufficient.

In addition, this soil is characterized by water permeability and softening complexity. As a result of watering, soil in the layer becomes denser. A thick layer is formed after watering and drying or harvesting (M.A.Pankov, 1970).

Description of varieties planted in the experiment. Soybean Uzbekistan-2 variety and Vatan and Uzbekistan-306 MB hybrids of maize were planted in the experiment.

The Uzbekistan-2 variety was created at the Uzbeksiton Agricultural Institute. This-medium variety, 50-55 days from sowing to flowering, 125-130 days to maturity. The stem grows upright, the trunk is hollow, the height of the stem can be 75-130 cm. The leaf is complex, three-lobed, large and hairy. The length of the leaf band is 10 cm. When ripe, 75 % of the leaves fall off. The flowers are white, 2-7 in the inflorescence he died. The pods are gray, small, 2.4-4.0 cm long. Pods do not split when ripe, on average, one bush produces about 60 pods. The grain is average, the weight of 1000 grains is 140-150 g. Grain yield in irrigated lands is 30-32 c . It is 10.4 c/ha in agricultural lands. Grain contains 19.2-23.4 % oil and 33.6-39.3 % white sugar.

Vatan is a middle - aged hybrid created by the authors of the production group of the Erkin company. It is recommended for grain and silage according to the republic. A simple hybrid. Grainy, jagged, it's too far away. Height of the plant is 240-290 cm, 18-20 leaves. The stem is cylindrical , the average length is 18-20 cm . The weight of ripe grass is 260-270 g, the weight of 100 grains is 280-330 grams, resistant to lying down. 80.7-86.7 c/ha of grain was obtained in the variety testing laboratories. The highest yield was 108.6 c / ha, which was 35.6 c/ ha higher than the model. Grain yield is 82-84 %.

Uzbekistan-306 AMV is a mid-early maturing hybrid that ripens in 95-97 days when replanted. The height of the stem is 220-230 cm. Maize is a toothed type of maize, the grain is yellow in color. When repeated sowing, 70-80 c/ha of grain and 230-250 c/ha are obtained.

Method of scientific research. The experiment was carried out in the field style, with 4 repetitions , the plot surface is 60 m², width 3 m, length - 20 m, the number of plants is 20

A. Crops were planted in pure h before (control options)

1. Maize - Vatan hybrid
2. Maize - Uzbekistan- 306 AM B hybrid
3. Soybean - Uzbekistan-2 variety

B. Crops are planted in a row.

4. Maize - Vatan + soybean
5. Maize - Uzbekistan-306 AMV + soybean.

Options are planted with three types of fertilizers:

1. N₉₀ R₉₀ K₆₀ - the first view
2. N₁₂₀ R₉₀ K₆₀ - second view
3. N₁₅₀ R₉₀ K₆₀ third view

Before sowing, N₉₀P₉₀K₆₀ rate of mineral fertilizers, 3 (60 kg (in the second and third trial)) of additional nitrogen (when 7-8 leaves are formed in the maize field) were added.

In the experiment, phenological observations, biometric measurements, calculations were carried out.

Experimental agrotechnics. Crops - the winter wheat crop is harvested, tilled and then planted. The wheat crop was planted on June 6, 4, 10 according to the years, mineral fertilizers were applied on June 8, 6, 11 and then plowed, chisel and harrow were used. Experiments were planted on June 12, 10, 15 in wide rows, row width 60 cm, between plants 10 cm, sowing rate 25 kg in maize, 60 kg/ha in soybeans. During the period of operation, it was watered 3 times, the rate was 800-900 m³/ha, cultivation was carried out 2 times between the rows. Additional feeding was carried out on 12.07, 10.07, 15.07. Greens yield was harvested on September 5, 1-5, 10-15.

RESULTS AND DISCUSSION

Maize hybrids and soybeans were planted at recommended rates. The number of plants saved before harvesting is 64-76 thousand plants/ha in maize hybrids, in the soybean 67.1-67.6 thousand plants were saved.

Table 1

The number of crops, thousand bushes/ha

Options	Average		
	maize	soybean	total
I. N₉₀P₉₀K₆₀			
1. Vatan + soybean	64.0	67.1	123.1
2. Uzbekistan -306+ soybean	76.0	67.6	121.4
II. N₁₂₀P₉₀K₆₀			
1. Vatan + soybean	65.0	65.6	130.6
2. Uzbekistan-306+ soybean	77.7	65.4	143.1
III. N₁₅₀P₉₀K₆₀			
1. Vatan + soybean	68.3	59.1	135.4
2. Uzbekistan -306+ soybean	78.2	57.4	143.8

It was determined that there were 123.1-121.4 thousand plants in these options. On the basis of 90 kg of phosphorus and 60 kg of potassium, when the nitrogen rate was increased to 120 kg/ha, the number of plants saved was 7.5-21.7 thousand plants, and in the third background, 12.3-22.4 thousand more plants were saved.

Applied mineral fertilizers had a positive effect on crop growth, leaf surface and dry matter accumulation. When the crops were sown in pure state, the height of the soybean plant was 51 cm, and in the case of maize hybrids, it was 150-159 cm. When the crops were planted in the first background, the stem height was 3 cm higher in the soybean and 3-6 cm higher in the maize hybrids. In the second background of the experiment, the height of the stems was 6, 35, 37 cm higher in the control option compared to the first background, respectively. It was determined that the height of the stem was 2, 25, 26 cm higher when the crops were planted. This law was repeated in the third period, increasing the rate of nitrogen fertilizers stimulated the growth of crops.

In the second background of the experiment, the It was 24.3-25.0 thousand m²/ha in the soybean plant, and it did not change in the maize when it was planted in pure form.

Table 2

Biometric measurements of crops

Options	Indicators		
	stem height, cm	leaf area thousand m ² /ha	1 bush plant dry weight, g
I. N₉₀P₉₀K₆₀			
1. Soybean	51	18.1	65.7
2. Uzbekistan-306AMV	150	20.2	295.9
3. Vatan	159	20.2	327.8
4. Soybean Uzbekistan-306+soybean	54	6.3	37.2
	156	20.2	302.7
5. Soybean+Vatan	54	7.4	35.9
	162	20.2	333.6
II. N₁₂₀P₉₀K₆₀			
6. Soybean	56	24.3	117.1
7. Uzbekistan-306AMV	185	24.7	425.5
8. Vatan	196	25.0	453.7
9. Soybean Uzbekistan -306+soybean	58	10.5	42.6
	210	25.1	449.3
10. Soybean +Vatan	58	11.5	40.4
	222	25.5	485.3
III. N₁₅₀P₉₀K₆₀			
11. Soybean	58	27.3	129.9
12. Uzbekistan-306AMV	222	28.7	577.2
13. Vatan	238	29.3	621.9
14. Soybean Uzbekistan - 306+soybean	62	14.2	56.4
	230	29.6	609.4
15. Soybean+Vatan	62	14.9	52.2
	242	30.2	719.2

It was 10.46-11.54 thousand m²/ha when sowing mixed crops, and 25.1-25.5 thousand m²/ha in maize. In the third background of the experiment, when the crops are sown in pure form, 27.3 in the soybean, 28.1-29.3 thousand m²/ha in the maize, 14.2-15.0 in the soybean when mixed; in maize hybrids, it was 29.6-30.2 thousand m²/ha.

In comparison with pure sowing in maize hybrids, the positive effect of soybean plant and nitrogen fertilizer was determined.

A significant reduction in leaf surface area was observed when soybean was interplanted, due to the short stature of this plant. It was found that the lack of light had a negative effect when sowing in addition.

A similar pattern was observed in dry mass accumulation.

Table 3

Silage mass of crops, c/ha

Options	Crops		
	soybean	maize	total
I. N₉₀P₉₀K₆₀			
1. Soybean	75.6	-	756
2. Uzbekistan-306AMV	-	358	358
3. Vatan	-	484	484
4. Soybean+Uzbekistan -306+soybean	48.4	371.7	420.1
5. Soybean + Vatan	42.6	496.0	500.6
II. N₁₂₀P₉₀K₆₀			
6. Soybean	125.0	-	125.0
7. Uzbekistan-306AMV	-	434.1	434.1
8. Vatan	-	574.8	574.8
9. Soybean+Uzbekistan-306+soybean	85.5	451.6	537.1
10. Soybean +Vatan	75.1	598.7	672.8
III. N₁₅₀P₉₀K₆₀			
11. Soybean	151.2	-	151.2
12. Uzbekistan-306AMV	-	527.5	527.5
13. Vatan	-	640.5	640.5
14. Soybean+Uzbekistan-306+soybean	98.5	555.9	654.4
15. Soybean+Vatan	87.8	684.1	771.7
EKF, c/ha	6.1	9.8	18.4
%	3.7	2.1	3.0

Intercropping is aimed at producing nutritious feed for livestock. 358-484 c/ha of green mass was obtained in 75.64 maize hybrids in the first background when the crops were sown pure.

When crops were planted together, 48.4-42.6 c/ha of soybeans and 371.7-496.0 c/ha were obtained from maize hybrids. The total yield was 420.1-500.6 c/ha.

In the second background of the experiment, when the crops were sown in pure form, the yield of green mass was 125.0 c/ha in soybean and 434.1-574.8 c/ha in maize hybrids. It was found that the yield of soybean decreased by 39.5-44.9 c/ha when inter-planted, and it increased by 17.5-23.9 c/ha in maize hybrids. The same pattern was repeated in the third background of the experiment. It was observed that the yield of maize hybrids increased under the influence of soybean and

mineral fertilizers. It was found that the yield decreased in all variants when soybean was planted in addition. Unfavorable conditions for soybeans are created when inter-sowing. In general, silage content increases due to soybean cultivation. The proportion of soybean in the total harvest is 11.3-150%.

CONCLUSIONS

1. Maize hybrids are planted with soybeans as a repeat crop and mineral fertilizer in the appropriate amount. It was found that it is possible to prepare high - quality food when used.
2. Mineral fertilizer at the rate of $N_{150}P_{90}K_{60}$ when maize hybrids are planted with soybeans 97.1-97.7 % of the number of plants was saved due to its use.
3. sowing crops and mineral fertilizers on the growth of crops was observed. The stem of sorghum was 36.7-79.4 cm high due to $N_{120}P_{90}K_{60}$ - $N_{150}P_{90}K_{60}$, and 54.6-80.0 cm high due to the sowing method. Soybean seedlings grew by 5.0-7.7 cm due to fertilizer. Good growth of crops was observed when mineral fertilizer was used at the rate of $N_{150}P_{90}K_{60}$.
4. that the leaf surface was equal to 45.2 thousand sq.m/ha when the crops were planted with $N_{150}P_{90}K_{60}$.
5. The mass of silage when crops were planted in combination was obtained when soybean maize was planted in combination with Vatan hybrid, when mineral fertilizers were used at a high rate.

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