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The Influence Of Sowing Dates And Fertilizing Rates On Seed Yield Of Sunflower Varieties

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Abstract
This article examines the impact of mineral fertilizers on the yield of sunflower varieties grown as secondary crops in the Kashkadarya province. The higher results were taken when sunflower sown in early dates and mineral fertilizer norms used at the norms $N_{120}P_{100}K_{60}$.
Keywords: Sunflower, plant, mineral fertilizer, rate, average yield, variety

INTRODUCTION

In the world, scientific work is being carried out in a number of priority areas on the use of modern agrotechnologies in sunflower cultivation for the production of vegetable oil. In this regard, special attention is paid to research aimed at developing economically effective agronomic measures for sunflower cultivation by determining optimal planting dates and feeding standards for sunflower cultivation, based on the soil and climatic conditions of each region. Today, "the world's irrigated area is 1.6 billion hectares. Of this, sunflower is grown on about 23 million hectares of land used in agriculture to meet the demand for vegetable oil of about 8 billion people." In recent years, as a result of the increase in the population, the demand for vegetable oil has also increased. Therefore, one of the urgent issues is the development of economically effective agronomic measures to determine the impact of planting dates, fertilizer rates on the yield and quality of oilseed crops when growing them as a repeated crop.

Practical significance of the study. In our republic, agronomic measures are being carried out to determine the impact of fertilizer rates on the yield of oilseed crops in various soil and climatic conditions, and certain results are being achieved. The Resolution of the President of the Republic of Uzbekistan on additional measures for the further development of seed production of agricultural crops sets out tasks for the placement of oilseed, leguminous and fodder crops by types and varieties, based on soil and climatic conditions. Therefore, it is of great importance for our republic to develop economically effective agricultural measures that will increase the yield of sunflower as a repeated crop in irrigated agricultural areas.

MATERIALS AND METHODS

Research on increasing sunflower yield by applying mineral fertilizers was conducted at the central experimental field of the Southern Research Institute of Agriculture.

Sowing, cultivation and determination of yield of sunflower varieties “Diyor” and “Jahongir” were carried out on the basis of generally accepted methods [2; 3].

Statistical analysis of the data was carried out using the WinQSB-2.0 and Microsoft Excel programs according to the method of B.A. Dospekhov “Methods of field experiments” [4].

RESULTS AND DISCUSSION

It was found that when the sunflower varieties "Diyor" and "Jahongir" were planted as a repeated crop and fed at different rates, there was a difference in the seed yield obtained from the options. Accordingly, the average yield of the sunflower varieties "Diyor" and "Jahongir" in the control option 1, where mineral

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fertilizers were not applied ($N_0P_0K_0$) in the first period (15-20.06.2023), was 15.4; 15.5 q/ha, respectively. In contrast, in the second option, where mineral fertilizers were applied at the rate of $N_{80}P_{60}K_{60}$ kg/ha, the yield was 20.8; 21.3 q/ha, respectively. Fertilizers play an important role in plant metabolism, and as their application rate increases, the accumulation of dry matter increases. As a result, an increase in yield is observed. It was also found that in option 3, where mineral fertilizers were applied at the rate of $N_{100}P_{80}K_{60}$ kg/ha, the yield was 22.2; 23.0 t/ha, respectively.

Table 1

The influence of sowing dates and fertilizing rates on sunflower seed yield 2023

№	Sowing dates	Name of the varieties	Mineral fertilizers rate, kg/ha	Yield, q/ha			Avarage
				I	II	II	
1	15-20.06 y	Diyor	$N_0P_0K_0$	14.8	15.4	15.9	15.4
2			$N_{80}P_{60}K_{60}$	19.8	21.6	21.1	20.8
3			$N_{100}P_{80}K_{60}$	22.5	22.4	21.8	22.2
4			$N_{120}P_{100}K_{60}$	27.5	28.3	28.7	28.2
5			$N_{140}P_{120}K_{60}$	25.6	26.4	26.7	26.2
6		Jahongir	$N_0P_0K_0$	15.7	14.8	16.1	15.5
7			$N_{80}P_{60}K_{60}$	21.2	20.9	21.9	21.3
8			$N_{100}P_{80}K_{60}$	23.2	22.3	23.4	23.0
9			$N_{120}P_{100}K_{60}$	27.3	28.2	28.7	28.1
10			$N_{140}P_{120}K_{60}$	26.3	27.3	26.1	26.6
11	25-30.06 y	Diyor	$N_0P_0K_0$	15.3	15.2	14.7	15.1
12			$N_{80}P_{60}K_{60}$	19.3	20.3	20.8	20.1
13			$N_{100}P_{80}K_{60}$	21.3	21.7	21.4	21.5
14			$N_{120}P_{100}K_{60}$	25.9	26.7	26.4	26.3
15			$N_{140}P_{120}K_{60}$	26.7	25.4	25.5	25.9
16		Jahongir	$N_0P_0K_0$	15.8	15.5	14.9	15.4
17			$N_{80}P_{60}K_{60}$	19.9	20.3	21.1	20.4
18			$N_{100}P_{80}K_{60}$	22.4	23.3	22.3	22.7
19			$N_{120}P_{100}K_{60}$	27.4	27.3	26.8	27.2
20			$N_{140}P_{120}K_{60}$	25.8	25.9	26.5	26.1
21	5-10.07 y	Diyor	$N_0P_0K_0$	15.2	14.7	15.5	15.1
22			$N_{80}P_{60}K_{60}$	19.6	20.2	19.1	19.6
23			$N_{100}P_{80}K_{60}$	22.3	22.8	23.7	22.9
24			$N_{120}P_{100}K_{60}$	24.3	24.9	24.6	24.6
25			$N_{140}P_{120}K_{60}$	24.5	23.2	24.7	24.1
26		Jahongir	$N_0P_0K_0$	14.8	15.7	15.5	15.3
27			$N_{80}P_{60}K_{60}$	19.5	20.1	19.8	19.8
28			$N_{100}P_{80}K_{60}$	22.3	21.5	23.8	22.5
29			$N_{120}P_{100}K_{60}$	24.6	25.8	25.8	25.4
30			$N_{140}P_{120}K_{60}$	22.2	24.8	24.3	23.8

In variant 4 ($N_{120}P_{100}K_{60}$) and variant 5, where the use of mineral fertilizers was increased, the yield was 28.2; 28.1 and 26.2; 26.6 t/ha, respectively. (Table 1).

It is not only the agrotechnical measures used to increase the yield of plants. Perhaps, planting at times that ensure optimal growth and development of plants also has its effect. In particular, it was found that the seed yield of sunflower in the control variant 1, in which mineral fertilizers were not applied ($N_0P_0K_0$), sown in the second medium term (25-30.06.2023), was 0.3 q/ha lower than the control variant planted early and without mineral fertilizers, and in the variety "Jahongir" it was 0.1 q/ha lower. This also confirms the dependence of varieties on soil and climatic conditions. In variant 2 ($N_{80}P_{60}K_{60}$) and variant 3 ($N_{100}P_{80}K_{60}$), where the rate of mineral fertilizer application was increased, the seed yield was 20.1; 20.4 and 21.5; 22.7 q/ha, and in option 4 ($N_{120}P_{100}K_{60}$) and option 5, the yield was 26.3; 27.2 and 25.9; 26.1 q/ha, respectively. (Table 1).

As we noted above, despite the agrotechnical measures used, it was found that climatic conditions had an impact on the growth and development of plants in the late periods. In this case, the plant was infected by pathogenic microorganisms. Therefore, a negative impact on seed yield was observed. In particular, the average yield of the sunflower varieties “Diyor” and “Jahongir” in option 1, where mineral fertilizers were not applied ($N_0P_0K_0$), sown in the late third period (05-10.07.2023), was 15.1; and 15.3 q/ha.

In variant 2 ($N_{80}P_{60}K_{60}$) and variant 3 ($N_{100}P_{80}K_{60}$), where the rate of mineral fertilizer application was increased, the seed yield was 19.6; 19.8 and 22.9; 22.5 q/ha, respectively, and in variant 4 ($N_{120}P_{100}K_{60}$) and variant 5, the yield was 24.6; 25.4 and 24.1; 23.8 q/ha, respectively (Table 1).

CONCLUSION

It was found that the yield obtained from the variants differs between the variants under the influence of the rate of mineral fertilizers used in each variant. It is also necessary to base the conclusion that the rate of mineral fertilizers affected the yield of sunflower varieties on reliable data. During the study, the seed yield (q/ha) obtained from each variant of the field experimental area was determined.

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