



THE EFFECT OF SOWING SCHEME ON THE YIELD PARAMETRES OF SUNFLOWER VARIETIES

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Article history:	Abstract:
<p>Received: 21st October 2021 Accepted: 20th November 2021 Published: 27th December 2021</p>	<p>Sunflower (<i>Helianthus annuus</i> L.) is one of the most important oilseeds in the world today. Sunflower oil ranks first among vegetable oils selected in terms of quality. Therefore, in many countries around the world, the level of economic efficiency is increasing depending on the area under crops and the amount of harvest. The main way to increase the yield of sunflower is to cultivate modern fast-growing varieties that are adapted to the soil conditions of the region for each region. This scientific article develops the main elements of the technology of cultivation of oilseed sunflower as a secondary crop of high yields from early ripening varieties. Sowing sunflower as a secondary crop after wheat resulted in increased yields when planting schemes were applied correctly. Depending on the number of seeds in one basket and their weight sowing schemes, the elements of the crop - basket, number of seeds, weight and yield increase were proved when the seed sowing scheme was 70x30-1 as a repeat crop.</p>

Keywords: sunflower, crop, oil, predecessor, farm characters, basket, seed, seedling, repetition, cultivar, yield, early ripening, productivity, scheme.

INTRODUCTION

The content of sunflower oil is rich in vitamins, phosphates and easily digestible protein, necessary for the normal development and functioning of the human body, along with its healing properties, the plant is easily adapted to different climatic and soil conditions. For this reason, the sunflower plant is grown as a major oil crop in more than 100 countries around the world.

Sunflower is a waste-free plant, the core of the seeds contains 50-65% oil, 22-24% protein, vitamins (A, D, E, K) and phosphates. Sunflower oil is absorbed by the body to 86-91%, and 100 g of oil produces 929 kcal of energy.

LITERATURE REVIEW

In experiments, sunflowers gave good results when planted between rows 70-90 cm in width and 25-30 cm between bushes. When using a pneumatic seeder, 6-8 kg of seeds per hectare were used. After germination, the seeds were sown on the condition of leaving 3.5-4 seedlings per 1 m². It states that the thickness of sunflower seedlings is 35-40 thousand pieces [3], [4].

Sunflower varieties were planted by hand on July 8, the sowing scheme was 60x18, seed outgoings was 60-65 thousand seeds per hectare. According to the results of the experiment, the yield was 30.2 c / ha in "Yangi Zamon", 30.2 c / ha in "Osiyo" and 25.3 c / ha in "Buzuluk". The yield was 56.3% in the Yangi Zamon variety, 52.4% in the Buzuluk variety and 52.6% in the Osiyo variety. The highest result was observed in the " Yangi Zamon " variety [7].

When newly created intensive varieties of sunflower are planted without irrigation, high yields can be obtained when planted in the following seedling thickness: in the southern steppe - 40 thousand / ha, in the northern steppe - 50 thousand / ha, in the forest steppe - 55-60 thousand / ha. For hybrids, it is recommended to increase the seedling thickness to 10-15 thousand / ha, and sowing an average of 4-6 kg of seeds per hectare is considered effective [1], [2].

MATERIALS AND METHODS

Experiments were conducted in 2012-2014 in the typical sierozem soils of the experimental field of the "Center for Innovative Development and Consulting in Agriculture" of Tashkent State Agrarian University. In the experiment, 4 varieties of sunflower "Jahongir", "Rodnik", "Dilbar" and "Navruz" were grown in 4 schemes, 70x20-1; 70x25-1; 70x30-1; Sowing was carried out on 70x35-1. Placement, calculations and observations of field experiments "Methods of conducting field experiments" (5), stem height of sunflower varieties (at all stages of development), number of leaves per plant, basket weight, number of seeds in basket and their weight, 1000 seed weight, leaf surface (A.A. Nichiporovich, 1963), determined by the effect of the feeding area.

Yields were specifically determined and reduced to 12% humidity and 100% purity for each variant. The obtained data were analyzed mathematically according to the manual B.A. Dospikhov (1985) [6].

RESULTS AND DISCUSSION

The yield from plants is one of its most important indicators. In our study, it was observed that the effect of the nutrient field on the formation of yield elements of sunflower varieties was significantly greater (Table 1).

According to the results of the study, the diameter of the basket is 17.1 cm in the variant with a small feeding area of 1400 cm², 18.2 cm in the variant with a feeding area of 1750 cm², 19.6 cm in the variant with a high feeding area of 2100 cm² and a large in the variant with feeding area of 2450 cm², it was 20.2 cm.

In the same feeding areas of the Rodnik variety, the diameter of the baskets was determined to be 18.5, 19.8, 20.9 and 22.1 cm, while the Dilbar variety was found to be larger than the Rodnik and Jahongir varieties. It was 27.3 cm in the variant with a small feeding area of 1400 cm², 28.0 cm in the variant with a feeding area of 1750 cm², 29.0 cm in the variant with a feeding area of 2100 cm² and 29.5 cm in the variant with a large feeding area of 2450 cm². This variety was found to be 10.2 cm, 9.8 cm, 8.8 cm and 9.3 cm larger than the diameter of the baskets of the control variety "Jahongir".

The diameter of Navruz baskets was found to be larger than the Jahongir, Rodnik and Dilbar varieties studied in the experiment, the diameter of these baskets differed in the following sequence in terms of planting schemes compared to the cultivar "Dilbar": 1,7 cm, 4,2 cm, 3,8 cm and 3,5 cm. According to the planting schemes, the baskets with a diameter of 11.9 cm, 14.0 cm, 13.2 cm and 12.8 cm were larger than the control variety "Navruz" and the control variety "Jahongir".

The weight of the baskets obtained from the calculated plants was weighed and the total weight of one basket was determined. It was found that the feeding area had a positive effect on the weight of the baskets.

In the control variety "Jahongir" 70x20-1, the total weight of one basket was 67.9 g on average, and after the seeds were purchased from the baskets, the weight of the empty basket was 37.6 g. The total weight of the 70x25-1 planting scheme is 72.3 g and the empty basket weighs 32.8 g, the 70x30-1 planting scheme weighs 82.6 g and the empty basket weighs 33.6 g, and the 70x35-1 planting scheme weighs 89.4 g and the weight of the empty basket was 38.4 grams. The total weight of the basket according to the planting schemes is 7.3, 20.6, 20.3, 16.2 grams, and the weight of the empty basket is 0.8 grams lighter in the first variant, 9.7 grams in the second variant, and 5 in the third variant. 5.9 and the fourth variant weighed 2.0 grams.

In the experiment, the baskets of the Dilbar variety were large, with a large number of seeds and weight. At the same time, the total weight of the basket according to the planting schemes of the control variety "Jahongir" was 18.6, 40.4, 56.2, 61.5 grams and the weight of the empty basket was 3.7, 21.5, 32.6 and 30.0 grams. The total weight of the basket according to the planting scheme was 11.3, 19.8, 35.9, 45.3 grams and the weight of the empty basket was 4.5, 21.5, 26.7 and 28.0 grams.

Control of "Navruz" variety the total weight of the basket according to the planting schemes of "Jahongir" variety was 21.0, 32.5, 37.8, 44.4 grams and the weight of the empty basket was 7.6, 16.1, 15.6 and 14,5 grams. In the first variant of the "Dilbar" variety, the total weight of the basket was 2.4 grams, and according to other planting schemes it was 7.9, 18.4 and 17.1 grams lighter, while the weight of the empty basket was 3.9, 5.4, 17.0 and 15.5 grams.

The number of seeds in a basket and their weight depended on the feeding area, and an increase in feeding area led to an increase in the number and weight of seeds. In the first variant, the control variety "Jahongir" in the 70x20-1 sowing scheme had an average of 620.7 seeds per plant and weighed 30.3 grams. The second variant had 650.3 seeds in the 70x25-1 sowing scheme and weighed 39.5 grams. The third variant had 746 seeds in the 70x30-1 sowing scheme and weighed 49.0 grams, and the fourth variant had 825.3 seeds in the 70x35-1 sowing scheme and weighed 51.0 grams.

The number of seeds and their weight in the Rodnik variety was higher than in the control variety Jahongir, In the 70x20-1 sowing scheme the number of seeds increased by 67.8 pieces and weighed 8.1 grams, and in the 70x25-1 sowing scheme it increased by 101.7 pieces and weighed 10.9 grams, in the 70x30-1 sowing scheme it increased by 129.9 pieces and weighed 14, At 4 grams, the 70x35-1 planting scheme was observed to be 138.5 more and weighing 14.2 grams heavier.

In the experiment, the yield elements of Dilbar and Navruz varieties were close to each other and were higher than those of Jahongir and Rodnik varieties. In the sowing scheme 70x20-1 of Dilbar variety, one plant had an average of 517.2 seeds and weighed 45.2 grams. The second variant contained 685.4 seeds and weighed 58.4 grams. The third variant had 901.9 seeds, which weighed 72.6 grams, and the fourth variant had 1053.0 seeds, which weighed 82.5 grams. The number of seeds of this variety and their weight according to the sowing schemes of the control variety "Jahongir" increased by 83.1, 108.8, 156.1 and 238.3 pieces and weighed 14.9, 9.4, 23.6 and 31.5 grams heavy. According to the planting scheme of Rodnik variety, it was 15.3, 7.1, 26.2 and 99.8 grains and weighed 6.8, 8.0, 9.2 and 17.3 grams.

The number of seeds of "Navruz" variety and their weight increased by 106.7, 138.2, 198.5 and 285.3 pieces and weight of 13.4, 16.4, 22.2 and 29, according to the sowing schemes of "Jahongir" control variety. It weighed 9 grams. According to the planting scheme of the Rodnik variety, it was 38.9, 36.5, 68.6 and 146.8 more, and weighed 5.3, 5.5, 7.8 and 15.7 grams. According to the sowing schemes of Dilbar variety, it is 23.6 more, in subsequent schemes it is 29.4, 42.4 and 47.0 less and weighs 1.5, 2.5, 1.4 and 1.6 grams.

In the development of oilseed sunflower varieties according to the planting scheme, the diameter of one basket of harvested elements, cm The relationship between the total weight of the basket was calculated by the method of mathematical correlation Dospekhov (1979). According to mathematical calculations, the results of the analysis of variance showed that there is a positive correlation close to a high level between these indicators. In particular, the correlation coefficient between the two indicators was **$r=0.742$ ($R^2 = 0.5501$)**, indicating that there was a **positive** correlation closer to the high level. (Appendix 21)

An increase in the feeding area of sunflowers has led to a decrease in undeveloped seeds in the middle part of the baskets. In the control variety "Jahongir" in the scheme of sowing 70x20-1 undeveloped seeds was 12.2%, and in the scheme of 70x25-1 sowing was 12.0% and decreased by 0.2%. In the 70x30-1 sowing scheme or in the feeding area of 2100 cm², and the undeveloped seeds are 11.0%.

In the 70x35-1 planting scheme, or 10.3% of the feeding area of 2450 cm², a decrease of 1.2 and 1.9% was found compared to the variant with a smaller feeding area of 1400 cm². In the 70x35-1 planting scheme of Rodnik variety or in the feeding area of 2450 cm², it was found that the feeding area decreased by 1.0 and 1.7% compared to the variant with a smaller feeding area of 1400 cm². In the Dilbar variety, the undeveloped seeds in the baskets were found to be very low compared to the experimental varieties Jahongir, Rodnik and Navruz, and almost closer to the Navruz variety. In the 70x20-1 sowing scheme, the undeveloped seeds accounted for 5.9%, while in the 70x25-1 sowing scheme, the decrease was 0.5% to 5.4%. In the 70x30-1 sowing scheme or in the feeding area of 2100 cm², the undeveloped seeds were 4.1% and in the 70x35-1 sowing scheme or in the feeding area of 2450 cm² they were 4.0% compared to the variant with a feeding area of 1400 cm². A decrease was found of 1.9%.

In the 70x35-1 planting scheme of the "Navruz" variety or in the feeding area of 2450 cm², it was found that the feeding area decreased by 1.3 and 1.6% compared to the variant with a smaller feeding area of 1400 cm². Among the varieties, the percentage of undeveloped seeds in the baskets under sowing schemes of Dilbar variety was found to be 6.3, 6.6, 6.9 and 6.3% lower than in the control variety of Jahongir in the following order, while decreased by 5.1, 5.6, 6.2 and 5.6% compared to the Rodnik variety, and by 0.7, 0.6, 1.2 and 1.0% compared to the variety "Navruz". According to the results of the study, the percentage of undeveloped seeds in the middle part of the basket increased as the feeding area in all varieties increased. In this case, when the sunflower feeding area is large, it receives more resources such as light, moisture, nutrients, and forms large leaves, baskets, but as the baskets grow larger, it becomes more difficult for nutrients to reach the center of the basket.

The weight of 1000 seeds depends on the number of plant seedling thickness, and an inverse correlation is observed, i.e. the weight is heavy when planted densely, light when planted sparsely. It was amounted 69.8 grams in the first variant with a feeding area of 1400 cm², 68.5 grams in the second variant with a feeding area of 1750 cm², 65.7 grams in the third variant with a feeding area of 2100 cm² and in the fourth variant with a large feeding area of 2450 cm², it was 62.6 grams. It can be seen that there was a decrease of 1.3, 4.1 and 7.2 grams in the variants with the expanded feeding area compared to the variant with the smaller feeding area.

In the development of oilseed sunflower varieties according to the sowing scheme, the mathematical correlation between the grain elements per 1000 grain weight, gram and seed yield, c / ha was calculated according to the method of Dospekhov (1979). According to mathematical calculations, the results of the analysis of variance showed that there is a positive correlation correlation close to a high level between these indicators. In particular, the correlation coefficient between the two indicators is $r = 0.801$ ($R^2 = 0.6417$), which is closer to a high positive correlation, and showed the presence of detoxification.

The weight of 1000 seeds of Rodnik variety was found in the following order: 76.5, 74.3, 72.4 and 68.4 grams. This pattern was observed in the varieties "Dilbar" and "Navruz" studied in practice. Dilbar was 87.4, 85.2, 80.5 and 78.3 grams, while Navruz was 80.8, 78.2, 75.4 and 73.5 grams. formed.

Table 1
Influence of the sowing scheme on the yield elements of sunflower varieties (2016 - 2018)

№	Cultivars	Sowing scheme	Basket diameter, cm width	Total weight of one basket, g	Empty basket weight, cm	one plant productivity		Undeveloped seeds, %	1000 seeds weight, g
						Number of seeds, piece	Weight of seeds, g		
1	Jahongir (st)	70x20-1	17,1	67,9	37,6	434,1	30,3	12.2	69,8
2		70x25-1	18,2	72,3	32,8	576,6	39,5	12,0	68,5
3		70x30-1	19,6	82,6	33,6	745,8	49,0	11,0	65,7
4		70x35-1	20,2	89,4	38,4	814,7	51,0	10,3	62,6
5	Rodnik	70x20-1	18,5	75,2	36,8	501,9	38,4	11,3	76,5

6		70x25-1	19,8	92,9	42,5	678,3	50,4	11,0	74,3
7		70x30-1	20,9	102,9	39,5	875,7	63,4	10,3	72,4
8		70x35-1	22,1	105,6	40,4	953,2	65,2	9,6	68,4
9	Dilbar	70x20-1	27,3	86,5	41,3	517,2	45,2	5,9	87,4
10		70x25-1	28,0	112,7	54,3	685,4	58,4	5,4	85,2
11		70x30-1	29,0	138,8	66,2	901,9	72,6	4,1	80,5
12		70x35-1	29,5	150,9	68,4	1053,0	82,5	4,0	78,3
13	Navruz	70x20-1	29,0	88,9	45,2	540,8	43,7	6,6	80,8
14		70x25-1	32,2	104,8	48,9	714,8	55,9	6,0	78,2
15		70x30-1	32,8	120,4	49,2	944,3	71,2	5,3	75,4
16		70x35-1	33,0	133,8	52,9	1100	80,9	5,0	73,5

CONCLUSIONS

It was found that the weight of 1000 seeds obtained from Dilbar variety according to sowing schemes or feeding area was heavier than that of Jahongir control variety, Rodnik and Navruz varieties. In this case, the weight of 1000 seeds in the following sequence was heavier than the control variety "Jahongir" in terms of sowing schemes or feeding area; 17.6, 16.7, 14.8 and 15.7 grams. In the following sequence with respect to the variety "Rodnik"; 10.9, 10.9, 8.1 and 9.9 grams. As for the variety "Navruz" in the following sequence; It was found to weigh 6.6, 7.0, 5.1 and 1.8 grams.

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