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The Effect Of Sowing Schemes On The Productivity Of Sunflower Varieties

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ABSTRACT

Today, due to the increasing demand for vegetable oil worldwide, there is a growing trend in the production of seeds of major oilseeds. Due to its high nutritional value and dietary value, vegetable oil replaces animal fats in human consumption. The main way to increase the yield of sunflower is to cultivate modern early maturing varieties that are adapted to the soil conditions of the region for each region. This scientific article develops the basic elements of the technology of cultivation of oilseed sunflower as a secondary crop of high yields from fast-ripening varieties. Planting 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, it is proved that the number of seeds in the basket increases when the sowing scheme is 70x30-1 as a repeated crop - basket, number of seeds, weight, and yield.

KEYWORDS

Past, farm characters, seed, seedling, sunflower, reproducible, crop, scheme, oil, variety, yield, early ripening, productivity, basket.

INTRODUCTION

Sunflower seeds contain 50-54% of semi-drying quality oil. Its oil is used directly in food, in the preparation of canned fish, vegetables, in the manufacture of margarine, bread, and confectionery. Sunflower oil is rich in linoleic and oleic, unsaturated fatty acids, which contain 75-80% oleic and 12-17% linoleic acids. When processing seeds for oil, 33-35% of high-

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quality oil-cake are obtained. Oil-cake is rich in essential amino acids.

In addition to solving the problem of sunflower oil, the use of uncooked (unheated), refined salads, vegetable oils prevents the accumulation of cholesterol in the human body, increases the elasticity of blood vessels, prevents aging, and restores health. When analyzing the results of research in this area, it is important to provide the agricultural population with essential protein-rich oils, positive solutions to important and topical issues in agriculture, such as the creation and introduction of advanced technologies for obtaining high and quality crops from crops in different soil-climatic conditions, require research.

When planting sunflower as a secondary crop, it is important to use the vacant lands of wheat, to determine the correct planting schemes, to develop and introduce methods of intensive land use to harvest twice a year.

The relevance of the problem. 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 geterozises 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].

In experiments, sunflower gave good results when planted between rows 70-90 cm in width and 25-30 cm between bushes. When using a pneumatic seeder for sowing, 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 $1m^2$. 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 consumption was 60-65 thousand seeds per hectare. According to the results of the experiment, the yield was 30.2 ts/ha in the variety "Yangi zamon", 30.2 ts/ha in the variety "Osiyo" and 25.3 ts/ha in the variety "Buzuluk". Oil content in the "Yangi zamon" variety is 56.3%, in the “Buzuluk” variety is 52,4 %, in the “Osiyo” variety is 52,6%. The highest result was observed in the "Yangi zamon" variety [7].

RESEARCH CONDITIONS AND METHODS

Experiments were conducted in 2012-2014 in the conditions of typical gray soils of the experimental field "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 planted in 4 schemes, 70x20-1; 70x25-1; 70x30-1; 70x35-1.

Placement, calculations, and observations of field experiments “Methods of field experiments” (5), stem height of sunflower varieties (at all stages of development), the number of leaves per bush, basket weight, the number of seeds in the basket, and their weight, 1000 seed weight, leaf surface (A.A. Nichiporovich, 1963), [8] determined by the effect of the feeding area.

Productivity was reduced to 12% and purity to 100% by grinding separately for each variant. The obtained data were analyzed mathematically according to the manual by B.A. Dospekhov (1985) [6].

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RESEARCH RESULTS

Conditioned seeds are seeds whose sowing qualities meet all the requirements of the State Standard.

According to the results of the study, the yield of conditioned seeds was 87.8% when sowing the control variety "Jahongir" in the scheme 70x20-1, 88.0% when sowing in the scheme 70x25-1, in which an increase of 0.2% observed, in the scheme 70x30-1 89,0% and 89.7% when planted in a 70x35-1 planting scheme. It was found that conditioned seed increased by 1.9, 1.7, and 0.7% in the 70x35–1 planting scheme, which had a larger feeding area compared to the options with a smaller feeding area.

The yield of conditioned seeds of "Rodnik" variety was 88.3% when sown in the 70x20-1 scheme, 88.0% when sown in the 70x25-1 scheme, in which an increase of 0.7% was observed, 89.7% in the 70x30-1 sowing scheme and when planted in the 70x35-1 planting scheme, it was 90.4%. Conditioned seeds were found to increase by 2.1, 1.4, and 0.7% in the 70x35–1 sowing scheme, which had a larger feeding area, compared to variants with smaller feeding areas.

The yield of conditioned seeds from the "Dilbar" and "Navruz" varieties in the experiment was higher than in the control and "Rodnik" varieties. Both varieties were found to have almost the same amount of conditioned seeds, but the "Dilbar" variety was found to have 0.7, 0.6, 1.2, and 1.0% more conditioned seeds than the "Navruz" variety. According to the table, the highest yield in the experiment was in the 70x30-1 planting scheme (23.3 ts/ha) with a high feeding area of 2100 cm2 in the control variety "Jahongir".

In the 70x20-1 planting scheme with a feeding area of 1400 cm^2, the yield was 21.3 ts/ha and decreased by 2.0 ts/ha, In the 70x25-1 planting scheme with a feeding area of 1750 cm^2, the yield is 22.5 ts/ha, which is less to 0.8 ts/ha and In the 70x35-1 planting scheme with a large feeding area of 2450 cm^2, the yield was reduced by 2.7 ts/ha to 20.6 ts/ha. Seed yield of 30.1 ts/ha was obtained in the sowing scheme 70x30-1 with the feeding area of 2100 cm^2 in "Rodnik" variety. In the 70x20-1 sowing scheme with a feeding area of 1400 cm^2, the yield was 27.2 ts/ha, in which a decrease of 2.9 ts/ha was observed, In the 70x25-1 planting scheme with a feeding area of 1750 cm^2, the yield is 28.6 ts/ha, which is less to 1.5 ts/ha and In the 70x35-1 sowing scheme with a large feeding area of 2450 cm^2, the yield decreased by 3.6 ts/ha to 26.5 ts/ha.

Seed yield of 34.5 t / ha was obtained in "Dilbar" variety with 70x30-1 sowing scheme with feeding area 2100 cm^2. In the 70x20-1 planting scheme with a feeding area of 1400 cm^2, the yield was 32.1 ts/ha, in which a decrease of 2.4 ts/ha was observed, in the 70x25-1 planting scheme with a feeding area of 1750 cm^2, the yield was 33.3 ts/ha, 1.2 ts/ha less, and the feeding area was larger. In the 70x35-1 sowing scheme with 2450 cm^2, the yield decreased by 0.9 ts/ha to 33.6 ts/ha.

21.3 ts/ha was obtained from the variant of 70x20-1 sowing scheme with feeding area of 1400 cm^2 in "Jahongir" control variety, 22.5 ts/ha from the variant of 70x25-1 planting scheme with feeding area of 1750 cm^2, 23.3 ts/ha from the variant of 70x30-1 sowing scheme with feeding area of 2100 cm^2 and 20.6 from the variant of 70x35-1 planting scheme with feeding area of 2450 cm^2 ts/ha was obtained. In the variant with a feeding area of

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2100 cm², the experimental feeding area was 2.0 ts/ha compared to the variant with a small feeding area (1400 cm²), 0.8 ts/ha compared to the variant with a feeding area of 1750 cm², and 2.7 ts/ha compared to the variant with a large feeding area of 2450 cm² was found to produce a lot.

27.2 ts/ha was obtained from the variant of 70x20-1 sowing scheme with 1400 cm² feeding area of "Rodnik" variety, 28.6 ts/ha from the variant of 70x25-1 planting scheme with 1750 cm² feeding area, 30.1 ts/ha from the variant of 70x30-1 sowing scheme with 2100 cm² feeding area and 26.5 ts/ha from the variant of 70x35-1 planting scheme with 2450 cm² feeding area ts/ha was obtained. In the variant with a feeding area of 2100 cm², 2.9 ts/ha compared to the variant with a small feeding area (1400 cm²), 1.5 ts/ha compared to the variant with a feeding area of 1750 cm², and 3.6 ts/ha compared to the variant with a large feeding area of 2450 cm² was found to produce a lot.

It was found that the yield of the "Rodnik" variety in terms of planting schemes or feeding area was higher than the yield of the control variety "Jahongir". In this case, the yield was high in the following sequence according to planting schemes or feeding area; 5.9 ts/ha, 6.1 ts / ha, 6.8 ts/ha, and 5.9 ts / ha.

"Dilbar" variety yielded 32.1 ts/ha from the variant of 70x20-1 sowing scheme with feeding area 1400 cm², 33.3 ts/ha from the variant of the 70x25-1 planting scheme with a feeding area of 1750 cm², 34.5 ts/ha from the variant of the 70x30-1 planting scheme with a feeding area of 2100 cm² and 33.6 ts/ha from the variant of the 70x35-1 planting scheme with a feeding area of 2450 cm² ts/ha was obtained. In the variant with a feeding area of 2100 cm², 1.2 ts/ha compared to the variant with a small feeding area (1400 cm²), 2.4 ts/ha compared to the variant with a feeding area of 1750 cm², and 1.5 ts compared to the variant with a large feeding area of 2450 cm² was found to produce a lot.

It was found that the yield of "Dilbar" variety in terms of planting schemes or feeding area is higher than the yield of "Jahongir" control variety and "Rodnik" variety. At the same time, in terms of planting schemes or feeding area, higher yields were obtained in the following sequence than in the control variety "Jahongir"; 10.8 ts/ha, 10.8 ts / ha, 11.2 ts/ha, and 13.0 ts / ha. High yields were obtained in the following sequence compared to the "Rodnik" variety; 4.9 ts/ha, 4.7 ts/ha, 4.4 ts/ha, and 7.1 ts/ha.

Seed yield of 33.7 t / ha was obtained in 70x30-1 sowing scheme of "Navruz" variety with feeding area 2100 cm². In the 70x20-1 planting scheme with a feeding area of 1400 cm², the yield was 31.1 ts/ha, in which a decrease of 2.6 ts/ha was observed, In the 70x25-1 planting scheme with a feeding area of 1750 cm², the yield is 31.8 ts / ha, which is less than 1.9 ts/ha, and in the 70x35-1 planting scheme with a large feeding area of 2450 cm², the yield is 32.9 ts / ha, in which 0.8 ts/ha decrease was observed.

It was found that the yield obtained from the "Dilbar" variety in terms of planting schemes or feeding area was higher than the yield from the control variety "Jahongir", "Rodnik" and "Navruz" varieties. In this case, according to planting schemes or feeding area.
High yields were obtained in the following sequence compared to the control variety "Jahongir"; 10.8 ts / ha, 10.8 ts / ha, 11.2 ts / ha and 13.0 ts / ha. High yields were obtained in the following sequence compared to the control variety "Jahongir"; 10.8 ts / ha, 10.8 ts / ha, 11.2 ts / ha and 13.0 ts / ha. As for the variety

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"Navruz", the following sequence yielded a lot; 1.0 ts / ha, 1.5 ts / ha, 0.8 ts / ha and 0.7 ts / ha.

According to the results of the study on the total yield, in the planting scheme of 70x30–1 in all varieties of sunflower, the total yield was high, and in the variant with a high feeding area of 2450 cm^2, the total yield was reduce. Among the varieties used in the experiment, the highest total yield was observed in the variety "Dilbar", compared to the variety "Jahongir" - 11.2 ts / ha; The yield was 4.4 t / ha higher than in "Rodnik" and 0.8 t / ha higher than in "Navruz".

Table 1
Yield indicators of oilseed sunflower varieties
(2012 – 2014 yy.)

№	Varieties	Planting scheme	Output of conditioned seeds,%	Seed yield, ts/ha	Core output,%	The degree of fat content of the seed,%	Oil output, kg/ha
1	Jahongir (st)	70x20-1	87,8	21,3	72,0	58,7	1250
2		70x25-1	88,0	22,5	72,0	58,4	1314
3		70x30-1	89,0	23,3	72,4	58,1	1354
4		70x35-1	89,7	20,6	73,8	57,6	1187
5	Rodnik	70x20-1	88,3	27,2	73,4	59,4	1616
6		70x25-1	89,0	28,6	75,0	59,2	1693
7		70x30-1	89,7	30,1	75,3	59,0	1776
8		70x35-1	90,4	26,5	74,6	58,7	1555
9	Dilbar	70x20-1	94,1	32,1	75,8	59,5	1910
10		70x25-1	94,6	33,3	76,0	59,5	1981
11		70x30-1	95,9	34,5	76,7	59,2	2042
12		70x35-1	96,0	33,6	75,0	59,0	1982
13	Navruz	70x20-1	93,4	31,1	75,6	58,9	1832

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14		70x25-1	94,0	31,8	76,0	58,7	1867
15		70x30-1	94,7	33,7	76,6	58,7	1978
16		70x35-1	95,0	32,9	75,0	58,0	1908
HCP_{05}=ts/ha			0,20				
Sx = %				0,97			

The core was extracted from the sunflower seeds and the core was found to come out of the shell. According to the table of pistachio kernels, the control variety of "Jahongir" varied from 72.0% to 73.8%, which showed a decrease in pistachio kernels in the 70x20–1 planting scheme with a small feeding area of 1400 cm2. In the 70x25-1 planting scheme, 72.0% of the pistachio was extracted from the pistachio, while in the 70x30-1 planting scheme, it was slightly more than 72.4% and 73.8% of kernels were isolated in the 70x35-1 planting scheme with a large feeding area (2450 cm^2), which was found to be 1.4-1.8% more than in the small feeding area.

According to the planting scheme of "Rodnik" variety, it changed from 73.4% to 75.3%, which reduced the yield of pistachio kernels in the 70x20–1 planting scheme with a small feeding area of 1400 cm^2.

In the "Dilbar" variety, the same pattern was observed above varieties, in the 70x30-1 sowing scheme, pistachio kernels were extracted, 0.9, 0.7, and 1.7% more than in other experimental schemes.

In the "Navruz" variety, the same pattern was observed above varieties, in the 70x30-1 sowing scheme, pistachio kernels were extracted, 1.0, 0.6, and 1.6% more than in other experimental schemes.

It was found out that the yield of pistachio kernels from "Dilbar" variety is higher than from "Jahongir" control variety, "Rodnik" and "Navruz" varieties. In this case, in terms of planting schemes or feeding area, compared to the control variety "Jahongir" in the following sequence was more pistachio kernels; 3.8, 4.0, 4.3, and 1.2%. In the following sequence concerning the variety "Rodnik"; 2.4, 2.6, 1.4, and 0.4%. For the variety "Navruz" in the following order; 0.2, 0.1%.

According to the results of the study on the emergence of pistachio kernels, in all sunflower varieties in the planting scheme of 70x30–1 kernel yield is high, it was found that in the planting scheme with a feeding area higher than 2450 cm^2, the output of the core was reduced. Among the varieties used in the experiment, the lowest kernel yield was observed in the "Jahongir" variety. It should be noted that the seeds of "Dilbar" and "Navruz" varieties were large, while the seeds of "Jahongir" and "Rodnik" varieties were small.

The oil content of the seeds initially increases rapidly, slows down about 24 days after the start of flowering, and becomes stable. The

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degree of the fat content of sunflower seeds is determined by its varietal characteristics and growing conditions, in particular by the hydrothermal regime at the time of seed formation [Nikitchin D.I., 1993].

The oil content of sunflower seeds was determined on the YMR oil analyzer AMB-1600 and the following results were obtained: In the 70x20-1 sowing scheme with a small feeding area of the control variety "Jahongir", the oil content in the seeds was 58.7%, and the increase in the feeding area had a negligible effect on the seed oil content. It was found that 58.4% in the 70x25-1 planting scheme, 58.1% in the 70x30-1 planting scheme, and 57.6% in the 70x35-1 planting scheme.

This pattern was observed in all varieties of experiments and planting schemes. In the 70x20-1 sowing scheme with a small feeding area of the "Rodnik" variety, the oil content in the seeds was 59.4%, and the increase in the feeding area had a negligible effect on the seed oil content. It was found that 59.2% in the 70x25-1 planting scheme, 59.0% in the 70x30-1 planting scheme, and 58.7% in the 70x35-1 planting scheme.

At the same time, when planting in the scheme 70x20-1, 0.8% compared to the control variety "Jahongir", 0.1% compared to the variety "Rodnik" and 0.6% compared to the variety "Navruz", in this sequence in the scheme 70x25-1 to 1.1 %, 0.3% and to 0.8%, to 1.1%, 0.2% and 0.5% in the 70x30-1 planting scheme and 1.4%, 0.3% and 1 in the 70x35-1 planting scheme was found.

According to the sowing scheme, the amount of oil from one hectare of land was determined, and 1250 kg/ha of oil was extracted from the control variety "Jahongir" planted in the sowing scheme 70x20-1 with a small feeding area. It was found that 1314 kg/ha of oil can be extracted when planted in 70x25-1 scheme, 1354 kg/ha when planted in 70x30-1 scheme, and 1187 kg/ha when planted in 70x35-1 scheme. It can be seen that when sunflower is grown in a 70x30-1 planting scheme on a 2100 cm^2 feeding area, the amount of oil extracted from it will be higher than if the feeding area is larger or smaller. This pattern was repeated in other varieties studied experimentally.

1616 kg/ha of oil was extracted from "Rodnik" variety when planted in 70x20-1 scheme. It was found that 1693 kg/ha when planted in the 70x25-1 scheme, 1776 kg/ha when planted in the 70x30-1 scheme and a large feeding area, while in the 70x35-1 scheme it is possible to extract 1555 kg/ha of oil.

2042 kg/ha of oil was extracted from the "Dilbar" variety planted in the 70x30-1 scheme, and the amount of oil per hectare was higher than other experimental varieties. It was found that 1910 kg/ha of oil can be extracted in the 70x20-1 scheme, 1981 kg/ha in the 70x25-1 scheme, and 1982 kg/ha in the 70x35-1 scheme. The "Navruz" variety is similar to the "Dilbar" variety in terms of oil yield per hectare, and higher than the "Rodnik" and "Jahongir" varieties, when planted in the 70x20-1 scheme, 1832 kg/ha of oil was extracted. 1867 kg / ha when sown in 70x25-1 scheme, 1978 kg / ha when sown in 70x30-1 scheme and 1908 kg / ha can be extracted when sown in 70x35-1 scheme.

The amount of oil from the variety "Dilbar" was higher than in the control variety "Jahongir" in the following order: 660, 667, 688, and 795 kg/ha, compared to the variety "Rodnik" 294, 288, 266, and 427 kg/ha, and 78, 114.64 and 74 kg/ha compared to the "Navruz" variety.

CONCLUSION

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In all the varieties studied in the experiment, it was observed that the conditioned seeds were higher in the 70x35-1 sowing scheme with a larger feeding area.

The impact of planting schemes on the productivity of sunflower varieties was high. In all varieties, the variant with the sowing scheme 70x30-1 had a high yield (23.3; 30.1; 34.5; 33.7 ts/ha). Among the varieties, the highest rate was observed in the variety "Dilbar", which achieved a yield of 34.5 ts/ha, as well as the level of seed fat content in the sowing scheme 70x30-1 was 1.1%, 0.2%, and 0.5% higher than other varieties.

Seed sowing schemes or plant feeding area have a significant effect on the amount of oil extracted from sunflower seeds, the oil content in the seed in a small feeding area is high, but oil yield per hectare has been proven to be higher when the feeding area is 2100 cm^2.

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