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IMPACT OF FERTILIZERS ON SUNFLOWER YIELD UNDER IRRIGATED CONDITIONS IN UZBEKISTAN

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Annotation: Poor nutritious elements typical of irrigated soils in Uzbekistan was studied in the given options: 1) No fertilizer) 2) Nitrogen-100; Phosphorus, 70; Potassium-110kg/ha, 3) Nitrogen-150; FOS for-105; Potassium-165кг/ha, 4) Nitrogen-200; Phosphorus, 140; Potassium 220 kg/ha, 5) a Nitrogen-250; Phosphorus-175;Potassium 275кг/ha and the density of States: 35,7 thousand; of 40.8 thousand;47.6 per thousand;57.1 71.2 thousand Islands thousand plants per 1 ha. in all doses of fertilizer. B. depending on the changes in the density of standing and fertilizer standards, the yield and quality of seeds were different. With close density 71.2 million pieces of 1 hectare. and without fertilizers the yield was less and the quality of seeds was low. To obtain high marketable yield is reasonable when the density of standing 57,1 thousand/ha applied Nitrogen 200; Phosphorus 140; Potassium 220 kg/ha. effektivnym count method. To improve the quality of seeds podsolnechnika necessary when the density of 40.8 thousand/ha apply Nitrogen-250; Phosphorus-175; Potassium 275кг/ha. fertilizer rates

Key words: Sunflower, plant density, chemical fertilizers, vegetational period, yield, vegetable oil, seed quality, germination of seeds, kind seeds.

Introduction

The main oilseeds grown in the land are sunflower, rapeseed, groundnuts, sunflower, palm oil. Oilseed sunflower is grown in more than 100 countries, has an area of 298.5 million hectares and an average yield of 15.8 ts / ha, its oil is environmentally friendly. . [13; S. 305-309.]

It should be noted that according to the geographical location of each country, climatic conditions, population and their ethno-nutritional group, as well as taking into account the mofo-biological characteristics of the crop, certain oilseeds are grown there. [12; - S.16].

According to the morphology of sunflower, the stem is covered with thick hairs and the root is vigorous 3m to the ground. Going deeper means that this plant is a drought tolerant crop. [8 ;. S.10-12.]

According to some authors, even where the annual amount of natural precipitation during the season is 200 mm, some varieties of sunflower provide a yield of 6-10 ts / ha. [7; S.15-17.]

Therefore, in Ukraine, Russia and other countries where sunflowers are grown, sunflowers are grown mainly without irrigation. However, in the absence of artificial irrigation, the yield of sunflower depends mainly on the total amount of natural precipitation this year. In irrigated conditions, 40-45 ts / ha of oilseed sunflower seeds can be grown due to the use of intensive technology and sowing of intensive varieties that provide high yields. [10; s. 450-453 s ..]

Providing the population of the Republic of Uzbekistan with pure natural vegetable oil has always been a topical issue. Until 2000, the sowing of oilseeds, including sunflower for oil production, was not planned in the republic in order to provide the population of the Republic of Uzbekistan with environmentally friendly food oil decisions and orders have been made several times by the head of state. . [1;.]

Currently, to increase the volume of vegetable oils, sunflower is cultivated annually on an area of 40 thousand hectares of irrigated land in Ozbekitan. However, the average planned yield is 20c / ha, and the actual -12-13 c / ha [2; 311-315st ,;].

Relevance:

The main reason for the low yields of sunflower in irrigated conditions in the republic is that such agro-technological elements as fertilizer doses, optimal sowing dates, planting density, irrigation rates, taking into account biological characteristics, providing high yields in specific soil and climatic conditions, have not been developed.

According to the morphology of varieties and hybrids of sunflower, the plant grows from 1.5 m to 2.5 m in height, the number of leaves is from 15 to 35, the diameter of the stem is 15-23 cm. The average yield on the ground is 15.8 ts / ha. The amount of oil in the seeds is between 47-56% [2; st. 311-315 ,;] .However, with the change of fertilization and irrigation norms, it

is observed that the growth rates, yields and the amount of oil in the seed of this crop change to some extent. [7; S..15-17]

In the irrigated conditions of Uzbekistan determination of the optimal norms of mineral fertilizers, plant density and ensuring high yields, given the high need of sunflower for nutrients and the photophilousness of the crop, is considered relevant.

Sunflower is a demanding crop for nutrients. To obtain one centner of sunflower seeds yield, 5-6 kg of nitrogen, 2.0-2.5 phosphorus, 12-16 kg of potassium are required [8; 10-12]. Nitrogen ensures the growth and development of plants, the formation of vegetative and generative organs, and also increases the protein content in the seeds, phosphorus provides an increase in the protein in the seeds. While potassium does not provide increased oil, it prevents fungal and bacterial diseases. In addition, with the help of potassium, the assimilation of nitrogen and phosphorus elements improves [3; p. five; 6]. And [9; p..97-99].

Research goal:

Study of the combined effect of the influence of the density of standing and the norms of mineral fertilizers on obtaining high-oil-bearing marketable seeds from early-ripening sunflower varieties, with a yield of more than 30 centners / ha and with high sowing qualities in irrigated conditions in Uzbekistan.

Research methods.

Field experiments in 2014-2016 were carried out at an early date (as the main crop) on the old irrigated lands of the Bulungur region. The soils of the field experiment are typical gray soils, the occurrence of groundwater at a depth of 7-9 m, the texture is medium loamy, the soils are poorly provided with nutrients, in the arable layer the humus content is 1.13%, phosphorus is 0.15%, exchangeable potassium is 189 mg / kg ...

The object of the experiments is the seeds of the first reproduction of the early ripening variety SamKHI-20-80, entered into the State Register of Agricultural Crops and recommended for sowing on the territory of the Republic of Uzbekistan. The studied options for the density of standing and various norms of mineral fertilizers are shown in the table.

For a comparative study of the rates of fertilizers and the density of standing, the option without fertilizers and the density of standing (sowing pattern 70x30 cm) - 47.6 thousand plants / ha was taken as a control. The estimated area of the plots of the studied variants of the experimental plot is 56 square meters (the length of the plots is 20 m, six-row, row spacing 0.7 m). In the experiments, the options for fertilizer rates are arranged in 1 tier, according to the density of standing - in 5 tier order, in 4 replicates.

When studying scientific research, the methods of the Scientific Research Institute of Plant Growing of Uzbekistan (2009), the All-Russian Scientific Research Institute of Oilseeds (1986) and generally accepted methods were used.

Research results:

On the basis of the obtained research data, it was found that as a result of an increase in plant density from 35.7 thousand plants / ha (scheme 70x40 cm) to 71.4 thousand plants / ha (scheme 70x20 cm) in the option without fertilizers, an increase in fertilizer rates to nitrogen -250, phosphorus-175, potassium-275 kg / ha, the vegetation period of sunflower, morphological and reproductive organs, yield, oil content in seeds, sowing qualities of seeds varied to some extent.

In the first variant (without fertilizers), with a sowing pattern of 70x30 cm or with a plant density of 47.6 thousand plants / ha, the plants grew and developed well, the yield per plant was higher, the seeds were large, and there were relatively few shrunken seeds. In the same inconvenient variant, with thickened sowing (standing density 71.4 thousand pcs / ha or sowing pattern 70x20 cm), as a result of compaction, the plants received an insufficient amount of nutrients and sunlight, therefore, after the flowering phase, there was a significant damage to plants by fungal and bacterial diseases. As a result, the diameter of the baskets decreased (13-15 cm), and the number of small and feeble seeds increased. As a result, the smallest yield - 9.3 centners / ha, seeds with low quality, obtained at a plant density of 71.4 thousand pieces / ha in an unfertilized version.

In comparison with the unfertilized option, when applying in pure form nitrogen-100, phosphorus-70, potassium-110 kg / ha, intensive plant development was observed (table). The

growth of plants in comparison with the unfertilized variant was 19-25 cm higher, the leaf surface of 1 plant increased by 1121-1350 cm2 in accordance with the stand density. Plant disease was almost not observed. An increase in the average yield was determined by 1.2-2.1 times. In this variant, the highest yield of 22.5 c / ha was obtained at a plant density of 47.6 thousand pieces / ha.

With an increase in the norms of mineral fertilizers (Nitrogen-150, Phosphorus-105, Potassium-165 kg / ha - option 3), good growth and development of plants was observed, productivity indicators were high, and the yield increased significantly. In this variant, with a density of 57.1 thousand pieces / ha, the highest yield was obtained - 29.3 c / ha.

With the use of high rates of fertilizers nitrogen-200, phosphorus-140, potassium-220 kg / ha (option 4), although there was a slight slowdown in the development of plants, the yield increased in comparison with the previous option by 4.1-7.1 c / ha due to an increase the density of standing. The number of seeds has increased. However, the amount of oil in the seeds decreased by 0.3-0.4% compared to the control. In this variant, the highest yield of 36.1 centners / ha was obtained at a plant density of 57.1 thousand units / ha.

It was found that very high rates of application of mineral fertilizers (option 5) nitrogen-250, phosphorus-175, potassium-275 kg / ha absolutely slowed down the growth and development of plants.

Table 1.Fertilizer rates, standing density and yield of oilseed sunflower

№	Mineral fertilizers, kg / ha	Sowing scheme cm.	Planned planting density, thousand / ha	Average yield c / ha	Weight of 1000 seeds, g	Oil content in seed,%	Laboratory seed germination,%	Seed nature, g / l
1		70x40	35,7	9,6	37	50,3	91,4	346
		70x35	**40,8**	**10.9**	34	50,2	91,2	340
	No fertilizer	**70x30**	47,6	10.3	30	49,8	90,5	332
	(control)	70x25	57,1	9,8	25	49,3	88,6	301
		70x20	71,4	9.3	20	48,7	86,7	258
		HCP $_{05}$	-	1,22	-	-	-	-
2		70x40	35,7	17.4	55	50,8	93,5	388
		70x35	40,8	19.1	52	50,7	93,3	384
	N_{100} P_{70} K_{110}	70x30	**47,6**	**22.5**	47	50,4	93,1	366
		70x25	57,1	22.1	43	49,9	92,7	332
		70x20	71,4	20.6	36	49,3	92,3	297

		HCP $_{05}$	-	2,33	-	-	-	-
3	N_{150} P_{105} K_{165}	70x40	35,7	23.5	68	50,5	94,3	412
		70x35	40,8	25.8	65	50,4	94,2	408
		70x30	47,6	28.7	58	50,1	94,1	400
		70x25	**57,1**	**29.3**	53	49,6	93,7	371
		70x20	71,4	27.2	45	48,9	93,3	336
		HCP $_{05}$	-	2,52	-	-	-	-
4	N_{200} P_{140} K_{220}	70x40	35,7	28,4	79	50,2	94,9	425
		70x35	40,8	31,6	77	50,0	94,8	423
		70x30	47,6	33,7	69	49,8	94,7	413
		70x25	**57,1**	**36,1**	**66**	49,4	94,2	388
		70x20	71,4	34,3	58	48,5	93,8	354
		HCP $_{05}$	-	3.11	-	-	-	-
5	N_{250} P_{175} K_{275}	70x40	35,7	30.5	84	49,1	95,3	431
		70x35	40,8	33.8	84	48,9	95,3	430
		70x30	47,6	36,3	76	48,6	95,1	421
		70x25	57,1	38.4	71	48,1	94,6	409
		70x20	71,4	36,7	64	47,2	94,4	365
		HCP $_{05}$	-	2,54	-	-	-	-

The increase in the total yield was insignificant (2.1-2.4 c / ha) compared to the previous option (4). The oil content in the seeds decreased significantly (0.5-0.8%). From an economic point of view, such a slight increase in yield is ineffective.

However, at the rates of fertilizers nitrogen-250, phosphorus-175, potassium-275 kg / ha, a significant increase in the seed share of the crop was observed. In this variant, the maximum yield of 38.4 centners per hectare was obtained at a plant density of 57.1 thousand pieces / ha.

Conclusions

In unfertilized variants with a thickened density (scheme 70x20 cm) 71.4 thousand pieces / ha due to the compaction of crops, lack of sunlight and nutrients, a significant increase in the susceptibility of plants to diseases was observed. As a result, a decrease in the size of baskets and an increase in shrunken seeds were noted, the lowest yield was obtained with low-quality seeds. In the fertilized variants, with an increase in the plant density, due to the best supply of plants with nutrients, the plants developed intensively, the infection of plants with diseases

decreased, and large baskets with high-quality seeds were formed compared to the unfertilized variant.

To obtain the highest marketable yield (36.1 centners / ha) at a plant density of 57.1 thousand units / ha, the rate of fertilizers Nitrogen-200; Phosphorus-140; Potassium - 220 kg / ha is considered an effective method. In order to obtain seeds with the best sowing qualities, it is advisable to grow seed sunflower with a plant density of 40.8 thousand units / ha and a fertilizer rate based on Nitrogen-250; Phosphorus-175; Potassium-275 kg / ha. further increase in the norms of mineral fertilizers is ineffective.

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