

One Time and Seasonal Irrigation Rates of Corn in Condition of Saline Soils

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Abstract: Non-compliance with sorghum irrigation norms remains an urgent issue for its cultivation in conditions of medium salinity soils. In order to obtain green mass in sorghum in medium saline sierozem-meadow soils of Syrdarya region, it is desirable to water 4 times at the rate of 600-950 m³/ha in each irrigation, keeping 70-80-70% compared to LFWC before watering the plant during the growing season is appropriate. When irrigating corn in this manner, 665-692 m³/ha of water is saved from each hectare of corn field. This is an important factor in saving water, and is the highest measure to protect against secondary salinity in the conditions of saline soils.

Key words: agricultural crops, irrigation, saline soils

Introduction

The relevance of the topic: in the last 20-25 years, for various reasons, very large arable areas are being re-salted and are leaving the farming system. The reasons for this are the lack of timely reclamation measures on existing lands, including poor functioning of ditch-collector systems, failure to wash saline lands in time, permissible deficiencies in irrigation and irrigation systems, improper use of water resources for irrigation of agricultural crops in conditions of saline soils, one time and seasonal irrigation. We are not mistaken when we say that the norms are unreasonably exceeded, and in the conditions of these soils, not choosing salt-resistant crop types, etc (7).

The purpose and task of the research: It consists in studying the resistance of the "Qarabosh" variety of sorghum (sorghum) grown in saline lands to the effects of salt, the norms of salt washing and one time and seasonal irrigation of sorghum, and their scientific justification.

Object of the research: The research was conducted at the farm "Bekzafarlik Khorvadoril" of Babur SFU in the direction of animal husbandry in Oq Oltin District, Syrdarya Region: The soil of the experimental area is sierozem-meadow.

The field experiment was conducted in 9 variants, 4 repetitions. The options are arranged in one tier. The length of the building is 50 m. Each option includes 8 rows, i.e. one return of the seeder (50x5.6-280 m²). The total area of each plot is 280 m², the accounted area is 140 m². Based on this, the total area of the experiment was 10080 m², and the calculated area was 5040 m².

Methods And Materials

In field experiments in agricultural crops, the author Dospekhov B.A. "Methodology of conducting field experiments" developed by M. Kolos. 1979 y. and " Methodology of field experiment " developed by Nurmatov Sh and others. (Textbook. T.:2007-145 p.) used (2,3).

The field experiment was conducted in the following options

In options 1-3, the soil salt was not washed. Oats were irrigated at 70-80-75%; 70-80-70%; 70-70-70%;

In options 4-6, soil salinity was washed in November. Oats were irrigated at 70-80-75%; 70-80-70%; 70-70-70% compared to LFWC;

In options 7-9, soil salinity was washed away in February. Oats were irrigated at 70-80-75%; 70-80-70%; 70-70-70% compared to LFWC;

When corn is planted in rows, 14 kg/ha is the norm. The row spacing is 60 cm. The plant spacing is 15 cm. planting will give good results.

The agrochemical and water properties of the soil are studied in the experimental field.

In order to determine the agrochemical parameters of the soil of the experimental field, mixed soil samples were taken from 0-30 and 30-50 cm soil layers by envelope method from 5 points of the field. The total

amount of humus and the amount of humus in these samples I.M. Tyurin; nitrogen and phosphorus I.M. Maltseva, L.N.Gritsenko; in a nitrate nitrogen-ionometric instrument; mobile phosphorus is determined by the methods of B.P.Machigin and exchangeable potassium by P.V.Protasov.

Before planting, soil samples were taken in the 0-30 cm and 30-50 cm layers of the plowed and under plowed layers to determine the amount of NPK, general and mobile forms, humus, humus content and sent to the laboratory for analysis (2,3,4).

The volume weight of the soil is determined according to the irrigation procedures in each layer at depths of 0-50 cm from 10 cm.

The water permeability of the soil was determined using special cylinders in the spring and after harvesting.

Results And Discussion

As a biological species, sorghum is a drought-resistant plant based on its water requirements, but it is also a water-loving plant. From the physiological point of view, the plant's resistance to drought is related to its rich root system and the cells of the leaf mouth, which are very complex and surrounded by a light wax membrane. Strong root system of sorghum allows to absorb the necessary soil moisture even from the deep layers of the soil. This feature of the plant makes it a reason to call it a high level drought resistant plant (1,4,7,8,9).

The water demand of sorghum was not uniform during the growing season: the period of greatest water demand of the plant covered the period 10 days before broom emergence and 10 days after broom emergence. This development period is 25-30 days of the plant or 20-25% of the total vegetation period. During this period, the plant absorbs 45-50% of its total water consumption. In general, the most active period of sorghum in relation to water is during the period of broom release-flowering consumes 65-70% of water (9).

Taking into account the above, the correct determination of its irrigation regime is important among agrotechnical measures. Based on this, the 1st irrigation of sorghum is in the accumulation phase or 22-24 days after grass emergence, the 2nd irrigation is in the tuber making phase, the 3rd irrigation is in the fertilization or broom phase, the 4th irrigation is in flowering and the 5th irrigation giving the grain at wax and full maturity is important for obtaining a higher yield (7).

Table 1
One-time and seasonal irrigation rates of sorghum, 2019

Option no	Rate of one-time and seasonal irrigations					Seasonal watering rate, m ³ /ha.
	1-watering	2- irrigation	3-watering	4-watering	5 - watering sh	
1	2	3	4	5	6	7
1.	964	630	652	786	786	3818
2.	964	622	616	949	-	3153
3.	935	935	949	-	-	2819
4.	964	622	620	780	786	3772
5.	964	622	652	935	-	3173
6.	949	935	935	-	-	2819
7.	905	652	620	786	786	3749
8.	935	652	620	964	-	3171
9.	964	935	964	-	-	2863

Oats were irrigated from 3 to 5 times during the growing season according to the experimental options. According to the options, the irrigation rate was between 620 m³/ha and 964 m³/ha. When determining the irrigation rate during the vegetation period, the thickness of the calculation layer and the amount of moisture in it were taken into account. When setting the next watering, it was based on the demand of corn for water.

Thus, in 2019, in the control option (option 1) where the soil salt was not washed, corn was irrigated 5 times during the growing season. The daily irrigation rate was in the range of 620-964 m³/ha (Table 1). Also, in the 2nd and 3rd variants of the experiment, the rate of irrigation each time was 622-949 m³/ha, and during the growing season, corn was irrigated 3-4 times, respectively. In this case, the seasonal irrigation rate was 3818 m³/ha in the 1st option, 3153 m³/ha in the 2nd option, and 2819 m³/ha in the 3rd option. In experimental options (options 4-6) in which the soil salt was washed in November, that is, in the 4th option of the experiment, 620-964 m³/ha during the sorghum vegetation period, as in the above options watered in moderation. In the 5th variant of the experiment, the rate of irrigation per acre was 622-964 m³/ha, corn was irrigated 4 times during the growing season, and finally, in the 6th option, the rate of irrigation per acre was 935-949 m³/ha and it was irrigated 3 times. In these options, the seasonal irrigation rate was 3772 m³/ha in the 4th option, 3173 m³/ha in the 5th option, and 2819 m³/ha in the 6th option. According to the experimental system, the soil salinity was washed in February in accordance with the above (variants 7,8-9), that is, in the 7th variant of the experiment, 620-905 m³/ha during the sorghum vegetation period irrigated in the norm. In the 8th variant of the experiment, the norm of each irrigation is 620-964m³/ha and finally, in the 9th option, corn was irrigated at the rate of 935-964 m³/ha. The seasonal irrigation rate was 3749 m³/ha in the 7th option, 3171 m³/ha in the 8th option, and 2863 m³/ha in the 9th option.

Table 2
One-time and seasonal irrigation rates of sorghum, 2020

Option no	Rate of one-gallon and seasonal irrigations					
	1-watering	2-irrigation	3-watering	4-watering	5 - watering	Seasonal watering rate, m ³ /ha.
1	2	3	4	5	6	7
1.	951	610	683	742	831	3817
2.	980	594	631	920	-	3125
3.	981	965	10 4 4	-	-	29 8 9
4.	995	668	700	843	843	4049
5.	950	668	698	950	-	3266
6.	965	995	995	-	-	2955
7.	980	639	661	831	831	3942
8.	995	661	683	1009	-	3348
9.	995	999	995	-	-	2989

In 2020, depending on the time of planting corn, irrigation of vegetation started 5-6 days late. The rate of irrigation per time was in the range of 594-1044 m³/ha according to the options. In this case, the soil moisture before the next irrigation was 594 m³/ha in the options with 80% of LFWC, and 1044 m³/ha in the options with 70% of LFWC. This year, the seasonal irrigation rate was in the range of 2989-4049 m³/ha according to options (Table 2). In 2021, the difference between the next irrigations was 3-4 days compared to 2020. In particular, in options where soil salt is washed in November (options 4, 5, 6), the 1st irrigation rate is 995 m³/ha, the 2nd irrigation is 683-981 m³/ha, the 3rd irrigation is 655-1053 m³/ha, 4th irrigation 831-980 m³/ha and 5th irrigation 816 m³/ha established the norm. In options washed with saline soil in February (options 7, 8, 9), the 1st irrigation rate is 953-1008 m³/ha, the 2nd irrigation is 682-997 m³/ha, the 3rd irrigation is 653-782 m³/ha, 4th irrigation 835-994 m³/ha and 5th irrigation 835 m³/ha established the norm.

It should be noted that before the next irrigation, the irrigation rate in the variants with 80% relative to LFWC in relation to LFWC changed by 667-683 m³/ha, while in the variants with 70% relative to LFWC it was 995-1018 m³/ha has changed.

Seasonal irrigation rate of sorghum increased from 2787 m³/ha to 4049 m³/ha in the years of experiment.

Table 3
One-time and seasonal irrigation rates of sorghum, 2021

Rate of one-gallon and seasonal irrigations							
Option no	1-watering	2- watering	3-watering	4-watering	5-watering	Seasonal watering rate, m ³ /ha.	
1	2	3	4	5	6	7	
1.	964	667	669	774	787	3861	
2.	968	600	667	953	-	3184	
3.	981	995	1031	-	-	3007	
4.	995	683	655	831	816	3980	
5.	995	668	668	980	-	3311	
6.	995	981	1053	-	-	3014	
7.	953	682	653	835	835	3958	
8.	994	684	684	994	-	3356	
9.	1008	997	782	-	-	2787	

Conclusion

In conclusion, it should be noted that at the time when the water reserves in the Republic are decreasing year by year, in the conditions of the moderately saline sierozem-meadow soils of the Syrdarya region, in order to obtain green mass in corn during the growing season, before watering the plant, it is necessary to maintain 70-80-70% compared to LFWC, due to soil moisture 600-950 m³/ha per watering 4 times is desirable. When irrigating corn in this manner, 665-692 m³/ha of water is saved from each hectare of corn field. First, it is an important factor in saving water in these conditions where water is scarce, and secondly, it is the highest measure to protect the soil from secondary salinity in the conditions of saline soils.

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