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IRRIGATION REGIME, PROVIDES A METHOD FOR CULTIVATION OF THE SOIL AND FERTILIZATION RATES GROWING IN RESEEDING SDI

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Abstract: *The article cites a close occurrence of groundwater in meadow-gray-earth soils with repeated sowing of soybeans in the established norms for treating seeds with bacteriological fertilizer resotorfin and 70-80-70% of the lowest water capacity positively affects the growth and development of crops. the first shoot of the leaves and until the appearance of sipodial branches over the soil part of the cultupes is relatively weakly developing from the root systems. In the conditions of meadow-gray-earth soils in Andijan region, the optimal irrigation and water consumption regimes were established after winter wheat when re-sowing soybean varieties "Orzu" and "Dustlik".*

Key Words: *repeated soybean crops, irrigation regime, water consumption, soil moisture reserves, irrigation rate, irrigation time, maximum field moisture capacity.*

1. INTRODUCTION:

A large number of microorganisms and invertebrates live in the lower layers of the soil. They, especially earthworms, break through the earth, plowing it, the roots of the plants divide the soil into parts, and then take out new roots and small holes appear instead of rotten roots. This spontaneously leads to improved soil aeration and hydrothermal procedures.

Scientific substantiation of the concept and development of practical recommendations for resource-saving and environmentally friendly technology for soybean cultivation on irrigated lands of Uzbekistan.

2. LITERATURE REVIEW:

In the study, based on the analysis of long-term scientific research in various regions of Uzbek and foreign countries, the author determines the relevance and prospects of developing soybean cultivation technology on irrigated lands of Uzbekistan.

According to Shumakov B. B., Kruzhilin I. P., Grigorov M. S. ', Aidarova I. P., Maslova B. S., Olgarenko V. I., Olgarenko G. V., Polyakova Yu. P., Shchedrina V.P., Penchukova V.M., Enkepa V.B., Brazhnika V.P., Smorodina I.I., Baranova V.F., Gubanova P.E., Kozina V.A., Pishcheyko L.N., Aristovoi L.D., Lebedovsky A.I., Kaliberda K.P., Leschenko A.K., Saenko N.P., Yasonidi O.E. and others, irrigation in areas of insufficient moisture is the main factor in increasing soybean productivity. Research and best practices show that irrigation contributes to a 2-3 times increase in soybean productivity compared to non-irrigated lands, yields reach 3-3.5 t / ha of grain and 35-40 t / ha of green mass. At the same time, many important issues related to changes in the morphology and biology of soybeans under irrigation conditions and a further increase in soybean productivity have not yet been resolved. So, with the appropriate selection of varieties and plant density, providing moisture and nutrients, soybean gives high yields, but still the yield is limited by various factors. Most often, the reason for the decline in yield is an insufficient supply of plants with moisture and nutrients in the critical phases of plant development or a lack of heat and a candle. At the same time, the responsiveness of soybeans to irrigation and the application of mineral fertilizers is not always adequate. There is a lot of information about nitrogen fixation, but the question of the optimal combination of doses of mineral nitrogen fertilizers and nitrogen fixation, the use of growth stimulants and trace elements has not yet been fully clarified.

3. MATERIALS AND METHODS:

All observations and censuses were carried out in accordance with the requirements of state and industry standards, generally accepted methods developed by the MSKhRU, KSRU, etc. Statistical processing of the obtained data, the establishment of patterns of influence of the studied factors on soybean growth and development were carried out using standard methods of mathematical analysis.

Scientific novelty of research. The possibility and effectiveness of soybean cultivation on irrigated lands of Uzbekistan are theoretically substantiated and experimentally confirmed. Based on experimental data, a comprehensive analysis and assessment of agro-climatic conditions, a scientific concept and practical recommendations for soybean cultivation on irrigated lands of Uzbekistan have been developed.

The biological features of soybean growth and development were studied, the irrigation regime and methods for soybean irrigation were substantiated.

The patterns of soybean water consumption in various agro climatic zones are determined and the relationships between productivity and moisture supply are established, biological coefficients of water consumption are obtained, and water consumption norms are calculated in years with different water balance deficits.

The regularities of the influence of changing abiotic factors on the morphological and biological characteristics of soybean varieties of different ripeness groups are established and the regionalization of soybean varieties for Uzbekistan in the region is proposed. The optimal seeding rates, timing and methods of sowing various varieties are determined.

The heat resources in different zones and the sums of active temperatures necessary for soybean ripening were specified, adaptive varietal regionalization of the territory was carried out, and elements of soybean cultivation technology in repeated crops were developed.

The patterns of soybean crop formation have been established depending on water availability and the level of mineral nutrition, the use of micronutrient fertilizers, growth stimulants and nodule bacteria, and a soybean fertilizer system has been proposed.

Chemical and agro technical methods of protecting soybeans from weeds, pests and diseases were studied and improved, and an integrated plant protection system was developed.

Identification of relevant research directions, development of field experiment schemes and observation methods, methodological criteria for assessing the influence of abiotic factors on morphological and biological features of growth and development, crop formation and soybean quality, mathematical relationships and their analysis, as well as the development of adaptive technology for soybean cultivation, its production verification and implementation, conclusions and suggestions to the production in the thesis were carried out personally by the author.

Employees of YuzhNIIIGiM and its core network: Smorodin II, Gorsheni, participated in a number of field studies. B.C., Pishcheyko JI.H., Kozin V.A., Malkina J.C., Zhorov Yu.A., Aristova L.D., Kulyagina G.A., Selitsky S.A. G. Senchukov participated in the agroclimatic zoning of the North Caucasus by natural moisture content. and Oleinik A.M. The total share of the agent in research projects, the results of which were put up for defense, amounted to more than 80%.

Plowing deeper norm worsens the above properties of the soil, resulting in plowing soil with low humus bottom, crust formed on the surface, which destroys the aero and hydrothermal processes in the soil, (K.M. Mirzazhonov).

One of the current problems is the preparation of soil for sowing before planting repeated crops after wheat. In addition, the soil and climatic conditions of the Fergana Valley are favorable for harvesting twice a year.

In order to obtain a high yield, many studies were conducted to determine the optimal fertilizer standards for soybeans in various soil and climatic conditions.

Of course, in the Far East it is believed that the use of mineral fertilizers in accordance with the requirements of plants N-130, P-140, K-60 kg / ha (in its pure form) creates favorable conditions for achieving a high yield. If, when sowing soybean varieties, even for fodder purposes, mineral fertilizers are not applied in the proper amount, low-grade crops will also have low growth, the number of leaves and the volume of the stem will decrease, which will lead to a decrease in the amount of green mass per hectare.

In scientific studies conducted in various soil and climatic conditions, the effectiveness of one or two types of agricultural technology for obtaining a high-quality crop from soybean culture was studied.

The influence of soil cultivation on soybean crops in Uzbekistan has hardly been studied, and the influence of fertilizer application rates and irrigation procedures has been determined in certain soil conditions.

Table - 1 shows the results of experiments conducted in the conditions of meadow-gray-earth and light gray-earth soils associated with a certain irrigation regime, as well as the irrigation and seasonal irrigation.

During the research year, soybean varieties were irrigated 4 times in the conditions of meadow gray earth soil, and 5 times in light gray soil conditions.

1- Table

Irrigation and irrigation rate of soybean varieties in the conditions of meadow gray and light gray soils, m ^{3} / ha

Pre-irrigation soil moisture relative to PPV , %	Years	Irrigation, m ^{3} / ha					Irrigation rate, m ^{3} / ha
		one	2	3	four	five	

Meadow gray earth soils							
70-80-70	2010	720	800	920	-	-	2440
70-80-70	2011	690	810	900	-	-	2400
70-80-70	2012	730	840	920	-	-	2490
80-80-80	2010	600	700	850	750	-	2900
80-80-80	2011	605	750	820	700	-	2875
80-80-80	2012	610	800	800	760	-	2970
Light gray soil							
70-80-70	2010	770	820	900	700	-	3190
70-80-70	2011	710	840	910	650	-	3110
70 80-70	2012	780	8520	910	700	-	3240
80-80-80	2010	690	720	800	650	600	3390
80-80-80	2011	600	720	810	650	600	3370
80-80-80	2012	610	740	820	600	610	3380

During the years of research, the norms of seasonal irrigation in the variants with soil moisture before irrigation 70-80-70% of the maximum field moisture capacity (PPV) in meadow gray-earth soil amounted to 2400; 2400; 2490 m3 / ha, and in light gray soil - 3190; 3110 and 3240 m3 / ha, respectively.

Due to the fact that relatively less amount of irrigation is determined in meadow-gray earth soil, respectively, the seasonal irrigation norms will also be slightly less. In the cases with soil moisture before irrigation 80-80-80% of the WSP, seasonal irrigation norms amounted to 2900; 2875; 2970 and 3390 3310; 3380 m^3 / ha according to soil types and years of study.

In both types of soil there was a similarity between the intended moisture content in the soil before irrigation and the actual one.

If in the conditions of meadow-gray earth soil the irrigation regime amounted to 70-80-70% of the WSP, the irrigation system was 1-1-1, in the variants with the irrigation regime 80-80-80% of the WSP, the irrigation system was 1-2 -1, in light gray soil the same number was 1-2-1, 1-3-1, respectively, table-2.

2- Table

Actual pre-irrigation soil moisture of soybean varieties in the conditions of meadow gray and light gray soils, relative to the WSP, in %

Pre-irrigation soil moisture relative to PPV , %	Years	Irrigation, m^3 / ha					Irrigation rate, m^3 / ha
		one	2	3	four	five	
Meadow gray earth soils							
70-80-70	2010	68.1	78,2	71.3	-	-	1-1-1
70-80-70	2011	70.0	80.1	70.3	-	-	1-1-1
70-80-70	2012	71.2	79.2	72.9	-	-	1-1-1
80-80-80	2010	81.0	78.9	80.1	79.1	-	1-2-1
80-80-80	2011	80.0	79.1	80.2	78.8		1-2-1
80-80-80	2012	82.0	79.2	80.3	78.8	-	1-2-1

Light gray soil							
70-80-70	2010	68.5	78.9	72.3	78.3	-	1-2-1
70-8 0-80	2011	70.1	81.3	70,4	79.3	-	1-2-1
70-80-70	2012	69.8	78.1	72.1	79.7	-	1-2-1
80-80-80	2010	78.1	81.3	79.1	80.1	83.1	1-3-1
80-80-80	2011	79.1	80,4	82.1	80.2	79.1	1-3-1
80-80-80	2012	77.3	81.3	78.1	79.3	81.3	1-3-1

It is established that these irrigation systems depend on the mechanical composition of soil types.

Table 3 shows that the days between irrigation periods (70-80-70% of the WSP) in meadow gray soil are 22-23 days, and in light gray soil it is 17-18 days, and in variants with irrigation regime 80-80-80% of the PPV, these indicators are 15-17 and 18-20 days.

Thus, depending on the physical properties of soil types, differences in seasonal irrigation rates and the number of days between irrigation systems and irrigation were determined.

The average scientific data for 3 years on the growth of soybean varieties, based on soil cultivation, fertilizer application rates and watering procedures, are presented in table-4.

3- Table
Irrigation dates for soybean varieties in meadow gray and light gray soils

Pre-irrigation soil moisture relative to PPV , %	Years	Irrigation, m^3 / ha				
		one	2	3	four	five
Meadow gray earth soils						
70-80-70	2010	4.07	07/20	08/15	-	-
70-80-70	2011	6.07	07/28	08/22	-	-
70-80-70	2012	8.07	07/30	08/24	-	-
80-80-80	2010	06/28	07/15	1.08	08.20	-
80-80-80	2011	08/29	07/18	3.08	08/25	-
80-80-80	2012	06/30	07/20	4.08	08/30	-
Light gray soil						
70-80-70	2010	1.07	07/22	08/15	5.09	-
70-80-70	2011	3.07	07/25	08/18	8.09	-
70-80-70	2012	2.07	07/28	08/19	10.09	-
80-80-80	2010	06/22	07/15	2.08	08/22	09/15
80-80-80	2011	06/23	07/15	4.08	08/25	09/13
80-80-80	2012	06/21	07/18	4.08	08/22	09/13

The creation of the Orzu variety in the conditions of meadow gray-earth soil was determined. The optimal conditions for the passage are plowing the soil at a depth of 20-22 cm before planting, the use of fertilizers N-50, P -90, K-60 kg per hectare and irrigation with an irrigation regime of 70-80-70% of PPV. The height, period of the bud, flowering and the bean period are 19.1; 30.5 and 685 cm, respectively.

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4- Table Influence on the growth of soybean varieties of irrigation regimes, fertilizer rates and soil cultivation methods, on average over 3 years (cm), (2010-2012)

No.	Varieties	Soil Processing Methods	Fertilizer rates, kg / ha			Estimated soil moisture relative to PPV , %	Meadow gray earth soils			Light gray soils		
			N	R	TO		In budding	In bloom	In the formation of beans	In budding	In bloom	In the formation of beans
1	Orzu	Plowing 20-22 cm	50	90	60	70-80-70	19.1	30.5	68.5	18.5	26.7	62.1
2		Plowing 20-22 cm	100	90	60	70-80-70	20,0	29.1	65,4	18.9	25.1	63,2
3		Chiseling by 15-18 cm	50	90	60	70-80-70	22.5	28,2	64.3	20.5	28.9	62,4
four		Chiseling by 15-18 cm	100	90	50	70-80-80	21.5	27.8	62.1	19.2	27.5	65.0
five		Plowing 20-22 cm	50	90	60	80-80-80	22.1	27.6	65.1	19.1	22.5	64,2
6		Plowing 20-22 cm	100	90	60	80-80-80	20.5	26.5	64.1	20,2	26.5	63,2
7		Chiseling by 15-18 cm	50	90	60	80-80-80	19.8	25.5	62.1	20,2	27.5	64.1
eight		Chiseling by 15-18 cm	100	90	50	80-80-80	19.0	25.8	61.3	19.1	26.8	65.1
9	Dýstlik	Plowing 20-22 cm	50	90	60	70-80-70	18.2	29.8	65.1	17.5	25.1	65.6
ten		Plowing 20-22 cm	100	90	60	70-80-70	19.1	27.6	63,2	17.8	26.2	64.3
eleven		Chiseling by 15-18 cm	50	90	60	70-80-70	17.5	25.1	61.0	19.1	27.5	67.5
12		Chiseling by 15-18 cm	100	90	50	70-80-70	16.5	34.1	60.1	18.2	26.5	63,2
13		Plowing 20-22 cm	50	90	60	80-80-80	17.8	26.1	58.2	18.1	25.5	61,4
14		Plowing 20-22 cm	100	90	60	80-80-80	18.1	25.1	57.1	17.8	24.3	64.3
15		Chiseling by 15-18 cm	50	90	60	80-80-80	18.0	24.2	54.1	19.1	25.1	65.1
sixteen		Chiseling by 15-18 cm	100	90	50	80-80-80	17.9	25.1	53,2	17.8	25,2	66.1

Raising the fertilizer coefficient to N-100, P-90, K-60 kg / ha or plowing the soil at a depth of 15-18 cm before planting and maintaining soil moisture at the level of 80-80-80% of the PPV slightly slowed the growth of soybeans.

It should be noted that when the soil moisture content is 80-80-80% of PPV, plowing the soil at a depth of 20-22 cm, the use of fertilizers N-50, P-90, K-60 kg / ha (5 - var.), Was observed relatively best soybean growth (65.1 cm).

Under the conditions of this soil, in the Dustlik soybean variety, subject to the same patterns, the height of this variety in the bean period was 65.1 cm, which was 3.4 cm lower than in the Orzu soybean variety.

It was found that relatively similar conditions were created for the cultivation of the Orzu soybean variety in light gray soil. Before sowing, the soil becomes thinner at a depth of 15-18 cm, and soil moisture before irrigation is 70-80-70% of the PPV, the use of fertilizers is N-50, P -90, K-60 kg / ha. The height of soybeans was 65.1 cm, with a change in the irrigation regime to 80-80-80% of PPV, the height of soybeans was 64.1 cm, with an increase in fertilizer application rates N-100, P-90, K-60, kg / ha - by 63.2 cm, when cultivating the soil with plowing the soil at a depth of 20-22 cm - 62.1 cm.

It was found that changing types of agricultural activities negatively affects soybean growth.

Favorable conditions for the growth of the Dustlik soybean variety, close to the Orzu soybean variety, were observed in this soil, where the soil is minified at a depth of 15-18 cm, the use of fertilizers is normal N-50, P-90, K-60 kg / ha, soil moisture before irrigation 70-80-70% of PPV, soybean height was 67.5 cm or higher than the highest indicator of Orzu soybean variety (65.0 cm), 2.5 cm.

Thus, the favorable conditions created for the growth of soybean varieties, in the first place, depend on the types of soil, methods of tillage, fertilizer rates and irrigation procedures.

Relatively favorable conditions for the growth of Orzu soybean varieties were determined on meadow gray-gray soil of the Ferghana Valley: pre-sowing tillage at a depth of 20-22 cm, the use of fertilizers in the norm N-50, P-90, K-60 kg / ha, with soil moisture before irrigation 70-80-70% of PPV. For the growth of the Dustlik soybean variety - pre-sowing chisele soil at a depth of 15-18 cm on light gray soil, the use of fertilizers in the norm N-50, P-90, K-60 kg / ha, with soil moisture before irrigation 70-80-70 % of PPV.

In addition, the methods of tillage, the effect of irrigation procedures depending on fertilizer rates on soybean fertility and physical properties of the soil have not been determined, and studies in the soil-climatic conditions of the Fergana Valley, conducted for the first time, indicate the relevance of these studies.

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