CHANGES OF DEPENDING ON DIFFERENT FACTORS THE WINTER WHEAT BIOMETRIC AND GRAIN YIELD INDICATORS

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Abstract. *In this article, the analysis of the results of a field experiment conducted to determine the effect on the soil fertility and the cultivation of a high-quality grain crop from winter wheat by determining the appropriate norms for the separation of the optimal types of leguminous crops that ensure the preservation and increase of the productivity of the typical gray soils subjected to irrigation erosion of the Samarkand region and the determination of convenient standards for the stratified application of mineral fertilizers given.*

Keywords: *wheat, usage, plant, growth, development phase, ripening, irrigation erosion, soil, seed, pod, yield.*

Wheat is used in a wide variety of foods

INTRODUCTION

Wheat is a grass widely cultivated for its seed, a cereal grain that is a worldwide staple food. The many species of wheat together make up the genus *Triticum*; the most widely grown is common wheat (*T. aestivum*). The archaeological record suggests that wheat was first cultivated in the regions of the Fertile Crescent around 9600 BC. Botanically, the wheat kernel is a caryopsis, a type of fruit.

Wheat is grown on more land area than any other food crop (220.7 million hectares or 545 million acres, 2021). World trade in wheat is greater than for all other crops combined. In 2021, world wheat production was 771 million tonnes (850 million short tons), making it the second most-produced cereal after maize (known as corn in the US and Australia; wheat is often called corn in other countries). Since 1960, world production of wheat and other grain crops has tripled and is expected to grow further through the middle of the 21st century. Global demand for wheat is increasing because of the usefulness of gluten to the food industry.

Wheat is an important source of carbohydrates. Globally, it is the leading source of vegetable proteins in human food, having a protein content of about 13%, which is relatively high

compared to other major cereals but relatively low in protein quality (supplying essential amino acids). When eaten as the whole grain, wheat is a source of multiple nutrients and dietary fiber. In a small part of the general population, gluten – which comprises most of the protein in wheat – can trigger coeliac disease, nonceliac gluten sensitivity, gluten ataxia, and dermatitis herpetiformis.

The purpose of the study. The purpose of this study is to distinguish the optimal types of leguminous crops, which ensure the preservation and increase of the productivity of the typical gray soils subjected to irrigation erosion of Samarkand region, and to determine the favorable norms for the stratified application of mineral fertilizers, to determine the effect on the cultivation of a high-quality grain crop from winter wheat and soil fertility.

The object of the study as typical gray soils of Samarkand region subjected to irrigation erosion, soybean "Nafis", mash "Marjon", bean "Makhsuldar", blue pea "Vostok-84", lucerne"Tashkentskaya-1728", winter wheat "Grom" varieties. and the standards for the stratified use of mineral fertilizers were obtained.

Experimented soil - climatic conditions

Jomboy district, where the study was conducted, is located in the northeastern part of Samarkand region, and covers an area of 0.56 thousand km^2, of which 19,686 hectares are irrigated and 2,837 hectares are dry-farmed. Of these irrigated lands, 80.9% are unwashed, 10.4% weakly, 6.2% moderately and 2.5% heavily washed, while 11.5% of drylands are unwashed, weakly, moderately and heavily washed areas are 16.0, respectively; 62.2 and 10.3%.

The irrigated agricultural lands of the Samarkand region are mainly located in the wide plains of the Zarafshan river.

The irrigated typical gray soils of Jomboy district, where research was carried out, fluctuate widely (from 0.8 to 1.5%) depending on the amount of humus in the plowed layer (0-30 cm), the level of soil leaching and the periodicity of irrigation, the amount of nitrogen in this layer is 0.04 -0.10%, depending on the lower layers of the profile, humus decreases to 0.4-0.6%. The ratio of carbon to nitrogen (C:N) varies from 6 to 10. Total phosphorus content is 0.16-0.20%, total potassium is 1.6-1.9%. As a result of the location of typical gray soils on uneven terrain, 80.9% of the total area is not washed, 10.4% is weak, 6.2 and 2.5% are moderately and strongly washed. The absorption capacity is 5-9, in some cases 9-12 mg.eq per 100 g of soil, the absorption complex is saturated with calcium (80-90%), and sometimes magnesium (10-15%) is found in abundance.
Scientific analysis of experimental results.

Crop structure of winter wheat. The main indicators of grain yield of winter wheat varieties grown in Uzbekistan are the length of the ear, the number of grains in the ear, and the mass of 1000 grains. It has been determined that there is a positive correlative relationship between these indicators and productivity.

After repeated sowing of soybeans, mineral fertilizers ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ кг/га) it was taken into account that the formation of crop elements in winter wheat grown under the conditions was slightly higher than the indicators of wheat grown after mash (Table 1).

In our scientific research conducted in the conditions of typical gray soils subject to irrigation erosion, the lowest results for all indicators of winter wheat yield elements were observed in the control (without fertilizer) option.

1-table

Effect of repeated and previous crops and stratified use of mineral fertilizer rates on winter wheat yield structure
(average in 2016-2019)

№	Repetitive type of crop	Level of soil leaching	NPK the norm is kg/ha	Spike length, cm, M±m	Mass of one spike, g M±m	The number of grains in a spike, pcs M±m	Mass of 1000 grains, g M±m
1	Winter wheat (control)	Not washed	-	8,8±0,14	1,35±0,01	40,6±0,21	33,8±0,12
2		Strongly washed	-	8,2±0,11	1,28±0,01	37,4±0,15	31,5±0,15
3	Winter wheat (control)	Not washed	$N_{180}P_{126}K_{90}$	9,4±0,13	1,43±0,02	46,3±0,25	36,4±0,26
4			$N_{150}P_{105}K_{75}$	9,1±0,16	1,40±0,01	43,5±0,17	34,2±0,21
5		Strongly washed	$N_{180}P_{126}K_{90}$	9,2±0,12	1,41±0,03	44,8±0,22	35,3±0,24
6			$N_{150}P_{105}K_{75}$	9,0±0,15	1,38±0,02	42,4±0,18	33,6±0,18
7	Beans	Not washed	$N_{180}P_{126}K_{90}$	9,8±0,21	1,48±0,03	49,5±0,26	38,5±0,23
8			$N_{150}P_{105}K_{75}$	9,6±0,18	1,46±0,02	47,3±0,21	37,4±0,17
9		Strongly washed	$N_{180}P_{126}K_{90}$	9,7±0,23	1,47±0,04	46,8±0,24	37,8±0,19
10			$N_{150}P_{105}K_{75}$	9,5±0,14	1,45±0,01	46,7±0,16	36,6±0,14
11	Mash	Not washed	$N_{180}P_{126}K_{90}$	10,4±0,27	1,52±0,04	53,6±0,33	40,3±0,35
12			$N_{150}P_{105}K_{75}$	9,9±0,22	1,50±0,03	50,3±0,26	38,9±0,27
13		Strongly washed	$N_{180}P_{126}K_{90}$	10,2±0,25	1,51±0,03	52,8±0,23	39,7±0,31
14			$N_{150}P_{105}K_{75}$	9,8±0,19	1,49±0,02	51,5±0,18	38,4±0,22
15	Soybean	Not washed	$N_{180}P_{126}K_{90}$	10,6±0,31	1,55±0,03	54,7±0,32	41,2±0,33
16			$N_{150}P_{105}K_{75}$	10,2±0,26	1,52±0,02	53,4±0,27	39,7±0,25
17		Strongly washed	$N_{180}P_{126}K_{90}$	10,4±0,29	1,53±0,03	53,6±0,31	40,5±0,21
18			$N_{150}P_{105}K_{75}$	9,9±0,23	1,51±0,01	52,5±0,25	39,4±0,19

19	Blue peas	Not washed	$N_{180}P_{126}K_{90}$	9,7±0,22	1,46±0,02	48,3±0,21	37,6±0,26
20			$N_{150}P_{105}K_{75}$	9,5±0,17	1,43±0,03	45,8±0,18	36,3±0,18
21		Strongly washed	$N_{180}P_{126}K_{90}$	9,6±0,19	1,45±0,02	46,7±0,23	36,7±0,23
22			$N_{150}P_{105}K_{75}$	9,4±0,15	1,42±0,01	45,2±0,16	35,5±0,15
23	Alfalfa	Not washed	$N_{90}P_{120}K_{90}$	11,4±0,31	1,62±0,03	61,5±0,32	43,4±0,36
24			N_{60} P_{90} K_{60}	10,9±0,28	1,59±0,02	60,2±0,23	42,2±0,28
25		Strongly washed	$N_{90}P_{120}K_{90}$	11,2±0,33	1,61±0,04	60,8±0,28	42,8±0,32
26			N_{60} P_{90} K_{60}	10,8±0,26	1,58±0,03	59,6±0,19	41,7±0,24

The length of the ear of winter wheat grown in the unwashed part of the soil of this option was 8.8 cm, the number of grains in the ear was 40.6, the mass of one ear and 1000 grains was equal to 1.35 and 33.8 grams. was 8.2 cm, 37.4 pieces, 1.28 and 31.5 g according to the above. After a repeated crop of beans, mineral fertilizers ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) The length of the ear of winter wheat in the variants used in the norm is 9.8-9.6 cm in unwashed areas, the number of grains in the ear is 49.5-47.3, the mass of one ear is 1.48-1.46 g, and the weight of 1000 grains is 38 ,5-37.4 g, these indicators are 9.7-9.5 cm long in the heavily washed fields, 1.5-1.3 cm higher than the control (without fertilizer), the number of grains in one spike is 48.6 -46.7 pieces or 11.2-9.3 more than the control (without fertilizer), the mass of one spike is 1.47-1.45 g or 0.19-0.17 g and the mass of 1000 pieces is 37, It was found to be 8-36.6 g or 6.3-5.1 g higher than the control (without fertilizer) option. Mineral fertilizer after blue peas ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) It was observed that the formation of crop elements in winter wheat in the variants used in the standards was close to the indicators of wheat grown after beans (Table 4.5). The data obtained for the years of the study are presented in Annexes 66-68.

In the unwashed part of the field, a repeated crop of moss was planted, and mineral fertilizers were applied to winter wheat. ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) in the used options, the length of the spike was 10.4-9.9 cm, the number of grains in the spike was 53.6-52.3, the mass of one spike and 1000 grains was 1.52-1.50 and 40.3-38.9 g If so, it was noted that these indicators are 10.2-9.8 cm, 52.8-51.5, 1.51-1.49 and 39.7-38.4 g respectively in the areas with strong washed soil in terms of the above fertilizers.

The highest indicators for the formation of crop elements were alfalfa and mineral fertilizers. ($N_{90}P_{120}K_{90}$ and $N_{60}P_{90}K_{60}$ kg/h) was observed in the options used in the norms. Winter wheat spike length in the unwashed portion of this variant, control ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) 2.0-1.8 cm, the number of grains in the ear is 15.2-16.7 pieces, the mass of one ear is 0.19-0.18 g and the weight of 1000 pieces is 7.0-7.9 g, compared to the variant it was noted that these indicators are 2.1-1.8 cm, 16.0-17.2 pcs., 0.20-0.19 g and 7.5-8.1 g more than the ones in the variants with strongly washed soil.

Thus, winter wheat mineral fertilizers were applied after repeated and successor crops (beans, mung beans, soybeans, blue peas, and alfalfa) planted on the unwashed portion of typical irrigation-eroded gray soils. ($N_{150}P_{105}K_{75}$ and $N_{60}P_{90}K_{60}$ kg/h) The spike length of the normally grown variants is 9.7-10.6 cm, the number of grains in one spike is 48.3-54.7, the mass of one spike is 1.46-1.55, and the weight of 1000 grains is 37.6-41.2 g, in the heavily washed part of the soil, mineral fertilizers should be applied after winter wheat mash, soybeans, especially three-year alfalfa. ($N_{90}P_{120}K_{90}$ kg/h) the highest indicators were also observed in the variants grown in the background, the length of the spike, 1.5-1.6 cm compared to the variants of beans planted as a repeated crop, the number of grains per spike was 12.0-14.1, and the number of grains per spike was 1000 masses of 0.14-0.16 and 5.0-6.1 g are high, and it was found that under these conditions, it is possible to grow the highest quality grain crop.

In our research (2016-2019) on typical gray soils subjected to irrigation erosion, the lowest indicators of winter wheat grain yield were 22.4-25.3 or an average of 23. 4 c/ha, and 16.8-20.6 or 18.6 c/ha are observed in areas with strongly washed soil. Mineral fertilizers in the conditions of winter wheat monoculture ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) when applied according to norms, the grain yield in areas with unwashed soil was on average 49.3-47.5 t/ha, and in options with heavily washed soil it was 46.7-44.2 t/ha, that is, the grain yield due to the application of mineral fertilizers was in accordance with the above It was observed that 25.9-24.1 and 28.1-25.6 c/ha were higher.

In studies, repeated crops are beans, followed by green peas ($N_{180}P_{126}K_{90}$ and $N_{150}P_{105}K_{75}$ kg/h) on the background of fertilizers, 61.5-60.2 and 60.8-59.4 and 60.3-59.4 and 58.6-57.5 c/ha grain yield was obtained, compared to the control, respectively 12.2-12, 7 and 14.1-15.2 and 11.0-11.9 and 11.9-13.3 c/ha were considered higher. However, it was noted that the optimal repeated crops, soybeans and three-year alfalfa, increased the grain yield due to the increase in soil fertility due to the effect of the three-year alfalfa crop, especially in heavily washed areas, and due to the stratified application of mineral fertilizer standards.

In the study, the grain yield of winter wheat, compared to the types of repeated crops, after beans and green peas, the grain yield of the variant with mush as a repeated crop was 6.8-8.0 and 6.0-6.8 t/ha in the variant with the soil not washed, the soil is strong and in the washed areas 6.9-9.1 and 6.4-8.3 t/ha, and in options with soybeans as a repeated crop, compared to the crop obtained after beans and green peas, in the options where the soil was not washed, 8.7-9.9 and 8.4-9.2 c/ha, 9.0-11.2 and 7.9-9.8 c/ha, respectively, provided additional grain yield in heavily washed areas.

In the experimental field, mineral fertilizers were applied after three-year alfalfa, the predecessor crop of winter wheat ($N_{90}P_{120}K_{90}$ and $N_{60}P_{90}K_{60}$ kg/h) the highest results were achieved when grown in the background, the grain yield was 74.5-72.7 c/ha in unwashed soil options, 51.1-49.3 c/ha due to mineral fertilizers and 25.2-25.3 c/ha due to the previous crop alfalfa if additional grain yield is obtained, these indicators are 73.8-72.2 c/ha, 55.2-53.6 and 27.1-28.0 c/ha, respectively, in variants with strongly washed soil, beans and 13.0-14.2 and 11.9-13.3 ts/ha compared to the grain yield in the non-washed part of the option, which is the predecessor of the blue pea, and 13.1-11.5 and 12.8-14, respectively, in the heavily washed options, It was observed that it was higher than 7 c/ha.

Conclusion. In summary, the highest yields of winter wheat under conditions of typical gray soils subject to irrigation erosion were 68.3-70.2-74.5 t/ha in non-washed areas after repeated crops of mung bean, soybean and three-year alfalfa as the previous crop. due to repeated crops,

19.0-20.9-25 c/ha, in areas with strongly washed soil, these indicators are correspondingly 67.7-69.8-73.8 c/ha, 21.0-23.1-27, 1 c/ha provides additional grain yield.

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