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Research Article

CHANGE OF PHOTOSYNTHETIC PRODUCTIVITY OF WINTER WHEAT IN IRRIGATED LIGHT COLOR GRAY SOILS DEPENDING ON THE RATE OF MINERAL FERTILIZERS

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ABSTRACT

The article presents the results of field experiments conducted to study the effect of mineral fertilizers of different standards on the photosynthetic productivity and pure photosynthesis productivity of winter wheat variety "Asr" in the conditions of irrigated light gray soils of Navoi region. It was found that the photosynthesis productivity was determined by the accounting balance of mineral fertilizers and the methods of soil plant diagnostics, and the options used in combination with pesticides with biologically active organic and mineral fertilizer Rokogumin were the highest.

KEYWORDS

Pale gray soil, wheat, mineral fertilizers, biologically active fertilizers, pesticides, leaf area, photosynthetic productivity.

INTRODUCTION

The yield of winter wheat grown in irrigated fields varies in a direct relationship with the productivity of photosynthetic processes. In order to grow a planned high-quality harvest of winter wheat in these fields, it is necessary to create its stem number, structure and leaf level. For this, in the leaf phenological stages of winter wheat, the soil must have sufficient moisture, nutrients, temperature, air exchange, and light.

It is known from the research conducted in different soil and climate conditions that in order to grow a high and quality crop from winter wheat, its leaf area should be 45-50 thousand m2 per hectare and the

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photosynthetic activity of the leaves, that is, their greenness should last for a long time [1, 2, 3]. . K.E. Khalgaeva [4], Depending on the rate of mineral fertilizers, various biostimulants in the light chestnut soils of Kalmykia

30.7-46.7 thousand m2/ha, photosynthesis productivity was 1322-2017 thousand m2/ha, and net photosynthesis productivity (FSM) was 1.02-2.11 g/day.

Experiment methodology. In 2022-2023, field experiments were conducted on irrigated light-colored meadow soils of the farm "Navbahor Saigali Kamoli" in Navbahor District, Navoi Region.

The soil of the experimental field is humus, low in nitrogen, moderately supplied with phosphorus and potassium substances, and the level of groundwater

It is 3-4 m. There were 11 variants of the experiment and they were repeated in three repetitions. The volume of plots (plots) was 400 m2, the area to be considered was 200 m2. Phosphorous (ammophos) and potash fertilizers (potassium salt) were applied under the plow in the fall, and urea with nitrogen fertilizers (46%) was given (tufting, hoeing and earing).

Effect of combined application of mineral and organo-mineral fertilizers and pesticides on photosynthetic productivity of winter wheat, average in 2022-2023

t/r	Options	Tubing-earing			Spike-ripening			Milk-wax ripening			During the average growing season		
		1	2	3	1	2	3	1	2	3	1	2	3
1	Fertilizer-free option	3,13	0,845	1,67	3,65	1,060	5,38	3,30	0,380	0,380	0,85	3,36	0,695
2,632	$R_{90}K_{90}$-фон I - autumn	3,40	0,935	1,73	3,93	1,143	5,22	4,13	0,275	0,95	3,82	0,784	2,65
3	Background I +N_{150}	3,48	0,952	1,78	3,83	1,114	5,22	3,97	0,304	1,10	3,76	0,790	2,76
4	Background I +N_{180}	3,64	0,974	1,76	3,91	1,130	5,97	4,01	0,356	1,08	3,85	0,820	2,25
5	Background I +N_{210}	3,67	1,055	1,80	4,07	1,181	5,40	4,06	0,358	1,02	3,93	0,865	2,74
6	$R_{120}K_{70}$ фон II- autumn	3,48	0,930	1,74	4,16	1,214	5,35	4,10	0,244	0,98	3,94	0,796	2,63
7	Background II +N_{150}	3,82	1,109	1,84	4,45	1,523	5,40	4,36	0,371	1,05	4,21	0,988	2,76
8	Background II +N_{180}	4,06	1,177	1,98	4,77	1,384	5,40	4,64	0,360	1,05	4,49	0,973	2,81
9	Background II +N_{210}	4,16	1,249	2,28	4,91	1,427	5,65	4,76	0,390	0,98	4,61	1,022	2,97

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10	NPK-70 ts/ha for crop + RG+20 g herbicide+ 0.15 l fungicide + 0.15 l/ha insecticide + spraying (suspension)	4,32	1,306	2,34	5,65	1,466	5,68	5,09	0,461	1,25	1,25	4,82	1,078
3,0911	NPK-80 ts/ha for crop + NK+20 g herbicide+ 0.15 l fungicide + 0.15 l/ha insecticide + spraying (suspension)	4,26	1,390	2,25	4,98	1,420	5,05	4,88	0,420	1,08	4,65	1,043	2,99

Note: 1-leaf level index, thousand m2; 2-photosynthesis productivity, million m2/ha; 3-photosynthesis net productivity, g/m2 day; RG-Rokogumin organo-mineral fertilizer; NK-Nanokrem is a biologically active fertilizer containing SiO3.

During the years of the experiment, the photosynthetic productivity (FM) and net photosynthetic productivity (FSM) of winter wheat were determined at different phenological stages depending on the leaf level index determined by the cross-sectional method (method vysechki).

According to the data of the Navoi Agrotechnology Department, the annual average rainfall is 196 mm, the average monthly air temperature is 12.3 0C, and the relative humidity is 65%. It was 13.4 0C, and the relative air humidity was 49%. In 2023, the amount of precipitation was 84 mm less than the long-term average, the air temperature was 1.3 0C lower, and the relative air humidity was almost 20% less than the long-term average.

RESEARCH RESULTS

According to the results of a two-year experiment, the effect of organic and mineral fertilizers on the index of wheat leaf level on the area of the planned autumn wheat harvest was noted already in its budding phase. At this stage, in the control of the experiment without fertilizers, the index of the leaf surface of wheat was on average 3.13 thousand m2, and its highest indicators (4.32 thousand m2) of the experiment were determined by the calculation balance method and

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soil-plant diagnostics. methods (10 variants) were determined. In this option, the level of winter wheat leaves was found to be 1.19 thousand m2 higher than in the option without fertilizer.

According to the researches, the highest indicators of the leaf surface index of "Asr" autumn wheat (5.05 thousand m2) were given through the roots of mineral fertilizers determined by the calculation balance method during the ripening period of the ear, containing amino acids, fulvates, macro and micro fertilizers Rokogumin (RG). along with biologically active fertilizers, 5% KAS (a mixture of carbamide and ammonium nitrate) and pesticides suspension was determined in the sprayed variant. By the milk wax ripening stage of winter wheat, a sharp decrease in the leaf level index was observed in the control variant of the experiment, and on the contrary, it was much higher in the variants given mineral fertilizers of different rates.

Photosynthetic productivity (FM) is one of the main parameters determining the duration of photosynthetic activity of winter wheat leaves in irrigated fields. The higher and more continuous the FM indicators are, the more the soil contains all the vital factors for the plant (moisture, nutrients, temperature, light, aeration).

In the non-fertilized control version of the experiment, the photosynthetic productivity of "Asr" winter wheat variety during the growing season was on average 0.659 million m2/ha, and in the fertilized versions it was 0.784-1.078 million m2/ha.

Its highest indicator (1.078 million m2/ha) of winter wheat according to the leaf level index was recorded in 10 options fed according to the calculation balance of the experiment and brg diagnostic method for yielding 70 ts/ha. In this variant, the spraying of Rokogumin universal organic and mineral fertilizer (2.5 l/ha), 5% KAS, fungicide and insecticide (0.15 l/ha) in winter wheat during the tuber and earing phases increased the photosynthetic productivity of winter wheat. .

The level of use of photosynthetically active radiation of winter wheat is determined by the photosynthetic net productivity (FSM) of the plant, that is, the amount of crop biomass during the day. According to the results of two years of research, the highest FSM indicators of winter wheat were recorded during the periods of milk ripening. Due to the natural fertility of the experiment during the growing season, the FSM indicator of winter wheat was 2.63 g/day on average, while this indicator was 2.65-3.09 g/day in varieties fed through roots and leaves at different rates.

According to two years of research, the following conclusions can be reached:

CONCLUSIONS

1. In the irrigated light-colored grassland soils of Navoi region, which are poorly supplied with humus and mineral nutrients directly assimilated by plants, the index of the leaf level of the winter wheat variety "Asr" was 3.36-4.87 thousand m2, depending on the norm of mineral fertilizers.

2. Physiologically active radiation (FAR) utilization rate of winter wheat is determined by leaf photosynthetic productivity (FM) and net photosynthesis productivity (FSM). These indicators are respectively 0.695 mln. m2/ha and was 2.63 g/day.

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