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INDICATORS OF GROWTH, DEVELOPMENT, HARVEST, AND GRAIN QUALITY OF AUTUMN WINTER WHEAT CULTIVATED WITH SHORT-TERM CULTIVATION

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Abstract: The article presents the results of long-term experiments on the growth, development, yield, and grain quality indicators of winter wheat in short-term crop rotations.

Keywords: short-rotation crop rotation, winter wheat, plant height, plant density, grain weight, repeated crop.

Introduction. As is known, currently, winter wheat is grown on more than 1 million hectares of irrigated land in our country. Considering that this crop can be a good predecessor for many crops, it has been established that crops grown after winter wheat in short-term rotations have a positive effect on plant growth, development, and yield.

According to B. Khalikov, A. Iminov, and F. Namozov, the introduction of repeated crops in short-rotation cotton-grain crop rotations positively influenced the restoration of plants' nutrient content in the soil and the preservation of soil fertility, leading to an increase in winter wheat grain yield by 15-20%. (1)

Also, according to the data of F.Namozov, B.Khalikov, the growth and development of wheat in short-rotation cotton-grain rotations at the end of the growing season (1.06) in all variants, the height of winter wheat averaged 101.3-106.5 cm, the number of bushes per 1 m^2 310.0-322.0 pieces, and the number of productive stems 344-360 m^2/pcs. It was established that the length of the ear was 1.9-2.0 g, the weight of 1000 seeds was 47.2-47.9 g. 2, 3, 4)

In the conducted experiments, winter wheat was sown in the first half of October. Sowing rates, irrigation, mineral fertilizer application, weed control, and disease control were carried out based on generally accepted recommendations in production conditions. Phenological observations of winter wheat were carried out against a general background in the germination, tillering, heading, and ripening phases.

According to the data obtained in the field experiments of short-rotation crop rotation in 2022, in the 2, 9, 10, 11, and 12 variants with winter wheat sowing, the plant density was 247.0-261.3 thousand plants/ha, plant height 88.5-91.8 cm, total stem number 634.2-669.7 pieces/m^2, productive stem number 408.6-432.7 pieces/m2, number of grains in one spike 35.1-38.0 pieces, grain weight in one spike

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1- table

Growth, development, yield, and grain quality indicators of winter wheat grown as a repeated crop in short-term crop rotations, 1st experiment (1st field) 2022-2024

№ Var	Crop rotation systems		Plant density, thousand *plants/ha*	Plant height, *cm*	Total number of stems, *m²/pcs.*	Number of productive stems, *m²/pcs.*	Number of grains in a spike, *pieces.*	Grain weight in a *spike, g*	Mass of 1000 grains, *g*	Grain yield, *c/ha*	Stem yield, *c/ha*	Protein grain, %	Grain gluten content, %
2	Control (winter wheat)	2022 year	261,3	91,8	669,7	408,6	35,1	1,4	39,7	56,8	47,5	14,9	28,0
		2023 year	254,7	89,3	674,6	413,0	34,7	1,3	39,0	54,5	49,3	15,1	27,9
		2024 year	237,0	87,1	655,5	391,3	30,7	1,2	37,9	45,8	51,9	14,7	27,4
9	1:2 (winter wheat + crotalaria)	2022 year	254,1	89,3	647,3	423,1	37,0	1,4	38,5	58,9	57,0	15,0	28,3
10	1:2 (winter wheat + crotalyaria + intermediate crop)	2022 year	250,0	90,0	634,2	429,3	38,0	1,4	38,2	59,5	54,9	15,5	28,7
11	2:1 (winter wheat + crotalaria)	2022 year	247,0	88,5	645,3	432,7	37,7	1,4	38,1	59,2	53,1	14,9	27,9
	2:1 (winter wheat + crotalaria + intermediate crop)	2023 year	256,0	91,3	661,3	438,9	37,2	1,4	38,4	60,2	57,3	15,4	28,9
12	2:1 (winter wheat + crotalaria)	2022 year	248,4	89,3	637,1	425,4	38,0	1,4	37,8	58,4	54,0	15,4	28,4
	2:1 (winter wheat + crotalaria + intermediate crop)	2023 year	260,0	88,9	666,0	438,1	37,4	1,4	37,7	60,2	55,1	15,0	28,0

1.4 g, 1000-grain weight 37.8-39.7 g, grain yield 56.8-59.5 c/ha, straw yield 47.5-57.0 c/ha, grain protein content 14.9-15.4%, grain gluten content 27.9-28.7 %.

According to the data obtained in 2023, the best indicators of winter wheat were observed in the variants with a 2:1 rotation with sowing winter wheat followed by the repeated crop crotalaria+shabdar, 2:1 rotation with sowing winter wheat followed by the repeated crop crotalaria+ intermediate crop, where plant density was 260.0 thousand/ha, plant height 88.9 cm, total stem number 666.0 m^2/pcs., productive stem number 438.1 m^2/pcs., number of grains in one ear 37.4 pieces, grain weight in one ear 1.4 g, 1000-grain weight 37.7 g, grain yield 60.2 c/ha, straw yield 55.1 c/ha, grain protein content 15.0%, grain gluten content 28.0%. Compared to the control variant, the plant density in 2024 increased by 23.0 thousand/ha, plant height by 1.8 cm, total stem number by 10.5 m^2/pcs., productive stem number by 46.8 m^2/pcs., number of grains in one spike by 6.7 pcs., weight of grains in one spike by 0.2 g, weight of 1000 grains by 0.5 g, grain yield by 14.2 c/ha, straw yield by 3.2 c/ha, protein content in grain by 0.3% and gluten content in grain by 0.6% higher.Full information is provided in Tables 1 of the article.

Conclusion: when growing winter wheat in short-rotation crop rotation schemes, application as a two-component crop in rotation schemes (2:1, winter wheat+crotaria+winter wheat+crotaria+shabdar and 2:1, winter wheat+crotaria+winter wheat+crotaria+shabdar+bersim) in terms of plant growth and development compared to perennial crops, plant density increased by 23.0 thousand/ha, plant height by 1.8 cm, total stem number by 10.5 m^2/pcs., productive stem number by 46.8 m^2/pcs., number of grains in one spike by 6.7 pieces, grain weight in one spike by 0.2 g, 1000 grain weight by 0.5 g, grain yield by 14.2 c/ha, straw yield by 3.2 c/ha, grain protein content.

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