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THE EFFECT OF IRRIGATION REGIME AND MINERAL FERTILIZER APPLICATION RATES ON THE YIELD STRUCTURE OF TRITICALE VARIETIES

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Abstract

This article provides information about the indicators that determine the yield of triticale. These indicators include the length of one ear, the number of grains per ear, the weight of grains per ear, the weight of 1000 grains, and the actual weight of the grain.

Аннотация

В данной статье представлена информация о показателях, определяющих урожайность тритикале. К этим показателям относятся длина одного колоса, количество зерен в колосе, вес зерен в колосе, вес 1000 зерен и фактический вес зерна.

Keywords

spike length, number of grains per spike, grain weight per spike, 1000 grains, nature, structure, climate, soil, agrotechnical measures.

Ключевые слова

длина колоса, количество зерен в колосе, масса зерна в колосе, 1000 зерен, природа, структура, климат, почва, агротехнические меры.

As we know, the yield of agricultural crops, including triticale, is determined by its biometric indicators, such as the length of one ear, the number of grains per ear, the weight of grains per ear, the weight of 1000 grains, and the actual weight of grains. These indicators vary depending on the climatic and soil conditions of the region where the plant is grown, as well as the agrotechnical measures used.

In our research, when we analyzed the impact of the applied agrotechnical measures on the yield elements of triticale varieties in terms of variants, the following results were found.

It was found that in the 70-70-60 irrigation regime variants of the triticale variety "Odyssey", the length of one ear increased from 9.56 cm to 15.3 cm; the number of grains per ear increased from 40.8-46.2 grains; the weight of grains per ear increased from 1.04 g to 1.6 g; the weight of 1000 grains increased from 38.2 g to 47.4 g; and the specific gravity increased from 665.3 g/l to 734.9 g/l.

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In the 75-80-70 irrigation regime variants of the same variety, the length of one spike was from 9.78 cm to 15.8 cm; the number of grains per spike was from 41.2 to 50.9 grains; the weight of grains per spike was from 1.15 g to 1.77 g; the weight of 1000 grains was from 39.1 g to 48.6 g; and the grain density was from 672.8 g/l to 736.9 g/l (Table 1).

We can see that the above pattern is repeated and the indicators increase in the 70-70-60 irrigation scheme variants of the triticale variety "Sardor". It was found that the length of one ear increased from 8.91 cm to 13.2 cm; the number of grains per ear increased from 38.4 to 45.6 grains; the weight of grains per ear increased from 0.77 g to 1.49 g; the weight of 1000 grains increased from 34.2 g to 42.4 g; and the specific gravity of grain increased from 612 g/l to 722.1 g/l.

Our research has shown that the above indicators for the "Sardor" variety with the 75-80-70 irrigation scheme increased compared to the 70-70-60 irrigation scheme. We can observe that the length of one ear increased from 0.29 cm to 1 cm compared to the 70-70-60 irrigation scheme; the number of grains per ear increased from 1.5 to 1.1 grains; the weight of grains per ear increased from 0.20 g to 0.10 g; the weight of 1000 grains increased from 0.9 g to 1.3 g; and the specific gravity increased from 1 g/l to 9.6 g/l.

Table 1

The effect of irrigation regime and mineral fertilizer application rates on the yield structure of triticale varieties

№	Varieti	Irrigation ne, ive to ONS, (%)	Mineral lizer rate, na)	Length ne spike,	Number grains per pcs.	Grain ght per ear,	Weight 1000 ns, gr	Grain ght, gr/l
1	Odyss	70-70-60	Control nout fertilizer)	9,56	40,8	1,04	38,2	665,3
2			NPK-90:60 - FON	10,2	41,9	1,26	44,3	683,5
3			FON+(YaraV UNIVERSAL - 2 l/ga)	12,3	43,9	1,44	45,1	698,6
4			FON+(YaraV UNIVERSAL - 4 l/ga)	13,77	44,8	1,52	46,3	719,7
5			FON+(YaraV UNIVERSAL - 6 l/ga)	15,3	46,2	1,6	47,4	734,9
6		75-80-70	Control nout fertilizer)	9,78	41,2	1,15	39,1	672,8
7			NPK-	11,2	43,3	1,33	44,2	690,3

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			90:60 – FON					
8			FON+(YaraV UNIVERSAL - 2 l/ga)	13,14	45,6	1,5	46,3	705,7
9			FON+(YaraV UNIVERSAL - 4 l/ga)	14,1	47,4	1,64	47,1	720,9
10			FON+(YaraV UNIVERSAL - 6 l/ga)	15,8	50,9	1,77	48,6	736,9
11	Sardor	70-70-60	Control (without fertilizer)	8,91	38,4	0,77	34,2	612
12			NPK-90:60 – FON	9,3	39,6	0,85	38,7	637
13			FON+(YaraV UNIVERSAL - 2 l/ga)	10,86	41,7	1,13	39,6	658,5
14			FON+(YaraV UNIVERSAL - 4 l/ga)	11,4	43,9	1,3	40,3	685,2
15			FON+(YaraV UNIVERSAL - 6 l/ga)	13,2	45,6	1,49	42,4	722,1
16		75-80-70	Control (without fertilizer)	9,2	39,9	0,97	35,1	613
17			NPK-90:60 – FON	9,41	41,4	1,19	39,2	639
18			FON+(YaraV UNIVERSAL - 2 l/ga)	11,9	43,1	1,32	40,7	666,4
19			FON+(YaraV UNIVERSAL - 4 l/ga)	12,8	44,7	1,48	41,1	692,7
20			FON+(YaraV UNIVERSAL - 6 l/ga)	14,2	46,7	1,59	43,7	731,6

When comparisons were made with mineral fertilizers, it was found that in the control (without fertilizer) variant of the "Odyssey" variety, the length of one spike was 9.56-9.78 cm; the number of grains per spike was 40.8-41.2 grains; the weight of grains per spike was 1.04-1.15 g; the weight of 1000 grains was 38.2-39.1 g; and the natural weight of the grain was 665.3-672.8 g/l. t was found that the NPK-180:90:60 - FON variant of the same variety, where mineral fertilizers were

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applied, had higher indicators than the control (without fertilizer) variant by 0.46-1.42 cm; by 1.1-2.1 grains; by 0.22-0.18 g; by 2.1-5.1 g; by 18.2-17.5 g/l. In addition, compared to the control (without fertilizer) option, the above indicators were 2.74 - 3.36 cm; 3.1 -4.4 grains; 0.4 - 0.35 gr; 6.9 - 7.2 gr; 33.3 -32.9 gr/l higher in the FON+ (YaraVita UNIVERSAL BIO - 4 l/ha) variant, where mineral fertilizers were applied, compared to the control (without fertilizer) option, the indicators were 4.21 - 4.32 cm; 4-6.2 grains; 0.48 - 0.49 gr; 8.1 - 8 gr/l higher. Our studies have shown that the standard of mineral fertilizers is 54.4-48.1 gr/l more and the standard of mineral fertilizers is 5.74-6.02 cm per hectare; 5.4-9.7 units; 0.56-0.62 gr per hectare; 9.2-9.5 gr per hectare; 69.6-64.1 gr/l more.

The above patterns were repeated when the analysis of yield elements was conducted on variants of the "Sardor" variety. It turned out that in the control (without fertilizer) variant, the indicators were 8.91-9.2 cm; 38.4-39.9 grains; 0.77-0.97 gr; 34.2-35.1 gr; 612-613 gr/l, which is 0.39-0.21 cm; 1.2-1.5 grains; 0.08-0.22 gr; 4.5-4.1 gr; 25-26 gr/l less than in the NPK-180:90:60 - FON variant where fertilizer was applied. Compared to the control (without fertilizer) option, in the variants with the application of mineral fertilizers FON+ (YaraVita UNIVERSAL BIO - 2 l/ha), these indicators were 1.95-2.7 cm; 3.3-3.2 grains; 0.36-0.35 g; 5.4-5.6 g; 46.5-53.4 g/l higher; in the variants with the application of mineral fertilizers FON+ (YaraVita UNIVERSAL BIO - 4 l/ha), the indicators were 2.49-3.6 cm; 5.5-4.8 grains; 0.53-0.51 g; 6.1-6 g; 73.2-79.7 g/l higher; It turned out that in the variants with the mineral fertilizer rate FON+ (YaraVita UNIVERSAL BIO - 6 l/ha), the indicators were higher by 4.29-5 cm; by 7.2-6.8 grains; by 0.72-0.62 g; by 8.2-8.6 g; by 110.1-118.6 g/l.

In the studies, when analyzing the yield elements, the highest indicator was observed in variant 10, where the triticale "Odyssey" was used with a 75-80-70 irrigation regime and mineral fertilizers FON + (YaraVita UNIVERSAL BIO - 6 l/ha), the spike length was 15.8 cm; the number of grains in the spike was 50.9; the weight of grains in the spike was 1.77 g; the weight of 1000 grains was 48.6 g; the natural weight of the grain was 736.9 g/l, while the lowest indicator was observed in variant 11, where the "Sardor" variety was used with a 70-70-60 irrigation regime and control (without fertilizers). In this case, the length of the spike was 8.91 cm; the number of grains in the spike was 38.4; the weight of the grains in the spike was 0.77 g; the mass of 1000 grains was 34.2 g; the natural weight of the grain was 612 g/l.

From this it can be concluded that both varieties can produce high-quality grain when the irrigation regime is 75-80-70 and mineral fertilizers are applied in increasing amounts.

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