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INFLUENCE OF SOWING DATES AND MINERAL FERTILIZER RATES ON TOTAL AND PRODUCTIVE STEM NUMBER OF WINTER RYE VARIETIES

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Abstract. This article examines the influence of sowing timing and mineral fertilizer application rates on the total and productive quantity of two varieties of winter rye (Vakhshskaya 116 and Ns Savo)

Key Words: Winter rye, stem, clumping, seeds, sowing time, mineral fertilizers

It is known from scientific literature that the total number of stems determines the total replenishment index of this crop, and the number of productive stems determines the level of replenishment productivity, and it can be different for fall grain crops.

If the total number of productive stems is 350-400 per square meter, it ensures the cultivation of 20-30 kg of grain per hectare. In the most favorable conditions, the number of productive stems can reach 700-800 per square meter [1].

The total number of stems formed in cereal crops during the tillering phase is called total tillering. Fall crops are stronger than spring crops. The number of productive stems varies with variety and soil conditions. Not all stems produce thorns, some are called thornless or thornless. Total plantation refers to the total number of stems in a single plant, and productive plantation refers to the number of stems giving spikelets, i.e., producing [2].

The above comments show that the formation of total and productive stems of fall grain crops differs, first of all, depending on the soil and climatic conditions of the cultivated region and, at the same time, on the applied agronomic measures.

It was observed that the above described regularities were reflected in our research conducted in 2020-2023.

In particular, the seeds of autumn rye variety Vakhshskaya 116 were sown on September 20, and during the vegetation period the norms of mineral fertilizers H150P105K75 kg/ha were used. When analyzing the 1st variant, the total number of stems per 1 m² of area was 796.0 pcs. on average, the number of productive stems - 490.6 pcs., it was found that the number of dormant stems - 12.7%, and the ratio of productive stems to the total number of stems - 70.6%. at sowing in this period and during the vegetation used rates of mineral fertilizers H180P125K90 and H210P150K105 kg/ha. The total number of stems compared to 2-3 variants 56.5-96.4 pcs/m², the number of productive stems 28.2- 50.0 pcs/m², and the proportion of productive stems compared to the total number of stems showed lower results by 2.2-1.9%, but it was noted the number of recumbent stems decreased by 3.7-6.2%.

Seeds of this variety were sown on October 1, and in the study of the 4th variant, in which the norms of mineral fertilizers H150P105K75 kg/ha were applied during the growing season, the total number of stems was 740.8 pcs/m². The number of productive stems - 479.8 pcs/m², the number of dormant stems - 6.4%, the ratio of productive stems to total stems - 69.2%, seeds were sown on September 20, the total number of stems was 55.3 pcs/m² in comparison with the 1st variant, in which during the growing season the norms of mineral fertilizers N150P105K75 kg/ha were applied, the total number of stems decreased by 1.4%, but the number of stems decreased by 6.3%.

Seeds were sown on October 1, mineral fertilizers H180P125K90 and H210P150K105 kg/ha were applied during the growing season, during the study of 5-6 variants, the total number of stems was 785.2-821.7 pcs. /m², the number of productive stems - 512.5-520.2 pcs/m², the number of dormant stems - 8.2-12.8 percent, the ratio of productive stems to the total number of stems - 71.1-72.6 percent, the total number of stems compared to variant 4, where mineral fertilizer rates H150P105K75 kg /ha were applied during the vegetation period at 44.5-81.0 pcs/m², the number of productive stems - 32.7-40.4 pcs/m², the ratio of productive stems to the

total number of stems was higher by 1.9-3.4 percent, but the number of dormant stems increased from 1.8 to 6.4 percent. Seeds were sown on September 20 and mineral fertilizer rates of H180P125K90 and H210P150K105 kg/ha were used, and compared to the 2-3 variants, the total number of stems was 67.3-70.7 stems/m² and the number of productive stems was 6.3-20.4 stems/ha. Although the ratio of productive stems to total number of stems showed a low result of 1.7-2.1 percent per m², it was observed that the number of stems decreased to 8.2-6.1 percent.

Seeds were sown on October 10, and in the analysis of variants 7-8-9 with fertilization with mineral fertilizers N150P105K75 kg/ha, N180P125K90 kg/ha and N210P150K105 kg/ha during the growing season, the total number of stems was 665.6-699.3-725.7 pcs./m², the number of productive stems 434.5-460.1-478.6 pcs./m², the number of dormant stems 4.7-6.0-7.5%, the ratio of productive stems to the total number. stems is 68.5 - 70.0-71.3%, the total number of stems compared to variants 1-2-3, when seeds were sown on the date of September 20 and fed with mineral fertilizer rates of N150P105K75 kg/ha, N180P125K90 kg/ha. ha and N210P150K105 kg/ha for vegetation 130,4-153,3-166,7 pieces/m², number of productive stems 56,1-58,8-62,0 pieces/m², ratio of productive stems to total number of stems 2,1-2,8-3,4% less, but lodging of stems decreased by 8,0-10,4-11,4%. Seeds were sown during this period compared to variant 7, in which mineral fertilizers H150P105K75 kg/ha were applied during the growing season, in variant 8-9, in which mineral fertilizers H180P125K90 and H210P150K105 kg/ha were applied during the growing season. The total number of stems was 33.6-60.1 stems/m². Although the number of productive stems was 25.6-44.1 pcs./m², and the ratio of productive stems to total number of stems was 1.5-2.8% higher, but the number of dormant stems was 1.3-2.8% higher.

In variants, where the variety of autumn rye Ns Savo was planted, reflected the repetition of the above rules, seed sowing was carried out on September 20, and during the vegetation period the norms of mineral fertilizers H180P125K90 and H210P150K105 kg/ha. were applied, in 11-12 variants during the vegetation period mineral fertilizers H150P1 05K75 kg/ha norms were applied. Compared with variant 10, the total number of stems 69.1-112.6 pcs/m², the number of productive stems 32.1. -54.4 pcs/m², the proportion of productive stems 1.9-3.6% higher than the total number of stems, there was an increase in the level of stem dormancy to 3.8-6.2%.

Seeds were sown in the period of October 1, and during the vegetation period, mineral fertilizer rates of N150P105K75 kg/ha, N180P125K90 kg/ha and N210P150K105 kg/ha were used.

Table 3.6

Effect of sowing dates and mineral fertilizer application rates on total and productive number of stems of winter rye varieties

No.	Field number variety	Sowing dates	Amount of mineral fertilizers, kg/ha	Total number of stems, pcs/m ²	Lodging stems, %	Number of productive stems, pcs/m ²	Ratio of productive stems to total stems, %
1	Savo	20.09.20	H180P125K90	67.3	1.7	6.3	9.4
2		20.09.20	H210P150K105	70.7	2.1	20.4	28.9
3		20.09.20	H180P125K90	67.3	1.7	6.3	9.4
4	Savo	10.10.10	N150P105K75	665.6	4.7	434.5	65.3
5		10.10.10	N180P125K90	699.3	6.0	460.1	65.9
6		10.10.10	N210P150K105	725.7	7.5	478.6	66.0
7	Savo	20.09.20	H150P105K75	33.6	1.3	25.6	76.2
8		20.09.20	H180P125K90	60.1	2.8	44.1	73.4
9		20.09.20	H210P150K105	60.1	2.8	44.1	73.4

Compared to variants 10-11-12, where H180P125K90 kg/ha and H210P150K105 kg/ha were applied, the total number of stems was 45.0-63.6-63.0 pcs./m², the number of productive stems was 23.0-37.5-42.8. pcs./m², it was observed that the number of productive stems was 1.2-1.4-1.6% less than the total number of stems, but the number of stems decreased to 2.3-1.7-0.9%. Seeds were sown during this period, and in variants 14-15, where mineral fertilizers H180P125K90 and H210P150K105 kg/ha were applied during the growing season, the total number of stems compared to variant 13, when mineral fertilizers H150P105K75 kg/ha were applied during the growing season the total number of stems was 50.5-94.6 pcs. /m² ha, the number of productive stems - 17.6-34.6 pcs/m², the proportion of productive stems exceeded the total number of stems by 1.7-3.2%, but noted that stem set increased to 4.4-7.6%.

Seeds were sown on October 10, during vegetation used mineral fertilizer rates H150P105K75 kg/ha, H180P125K90 kg/ha, H210P150K105 kg/ha, H150P105K75 kg of grain fertilizer/ha, compared with 10-ka. 11-12 variants, where H180P125K90 kg/ha and H210P150K105 kg/ha were applied, the total number of stems 100.2-128.2-134.2 pcs/m² ha, the number of productive stems 31.1-31.8 -31.1 pcs/m² compared to the total number of stems the number of productive stems was 2.1-2.4-2.7% less, but it was noted that the number of stems decreased to 8.7-11.2-11.5%. When sowing seeds during this period and when analyzing variants 17-18, in which the norms of mineral fertilizers N180P125K90 and N210P150K105 kg/ha per vegetation were applied, the total number of stems compared to variant 16, in which the norms of mineral fertilizers N150P105K75 kg/ha were applied per vegetation, was 41, 1-78.7 pcs/m², the number of productive stems - 31.3-54.4 pcs/m², the proportion of productive stems was higher by 1.6-3.0%. than the total number of stems, but it was observed that stem set increased to 1.3-3.4%.

From the data obtained, it can be seen that early planting of seeds has a positive effect on plant growth and the number of total and productive stems, but the amount of dormancy at the expense of stem growth is up to 20.3%. This resulted in a sharp increase in the proportion of productive stems compared to the total number of stems.

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