

INFLUENCE OF SOWING RATE AND PERIOD ON THE WEIGHT OF 1000 GRAINS OF COMMON SPRING WHEAT VARIETIES

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Obtaining high and stable grain yields is the most urgent task for the agro-industrial complex of the Middle Volga region. While creating and introducing modern varieties of spring soft wheat with high productivity potential into production, it is necessary to accompany them with new adaptive cultivation and seed production technologies. Currently, the region's plant breeders are paying special attention to finding ways to improve the applied varietal agrotechnologies, particularly the primary seed production technologies for locally adapted varieties [1 -2].

Among agronomic practices that contribute to the formation of productive crops and consistently high grain yields, the seeding rate is of great importance. The yield of spring wheat can decrease in both overly dense and sparse sowings. Plant density and their nutrition area are important and significant elements of grain crop cultivation technology. The productivity of the agrocenosis as a whole directly depends on plant density, which is formed from the initial periods of growth and development of spring wheat plants until harvest [3].

The potential of modern spring wheat varieties can be fully realized by establishing optimal plant density, which is primarily determined by the seed sowing rate [4]. At the same time, the applied sowing rates should be differentiated based on the variety's genotype and the agronomic background used, and adjusted for any changes in the cultivation conditions of the variety.

Determining the optimal seeding rate is currently one of the most crucial factors affecting the improvement of spring wheat seed quality and its yield properties [5]. Special attention should be given to this issue in the primary stages of seed production.

Agrotechnology for cultivating spring wheat for seed production purposes should be developed considering the biological characteristics of the variety (genotype) and by creating conditions for optimal stem density, which is regulated by the seeding rate. The use of optimal seeding rates is an important agronomic technique for increasing yield and more fully realizing the potential of spring soft wheat varieties. Based on research results, optimal seeding rates for modern varieties bred by the FGBNU "Volga Research Institute of Selection and Seed Production" have been recommended for agricultural producers in the Middle Volga region. For the Kinelskaya 2010 and Kinelskaya Yubileynaya varieties, the recommended rate is 4.5 million viable seeds per hectare; for Kinelskaya Niva, it is 5.0 million; and for Kinelskaya Otrada, it is 5.5 million. Using these optimal seeding rates will facilitate higher yields in spring soft wheat varieties and create better conditions for obtaining high-quality seeds. The obtained data are recommended for improving varietal technologies in the primary seed production units of the Middle Volga region [6].

In northern China, late sowing has been proposed as a common approach to combat

climate change and increase crop yields [7]. Liu et al. found that delayed sowing accelerates the growth process, shortens the vegetative period, and extends the grain formation period, thereby increasing wheat yields [10]. In contrast, Zhang et al. emphasized the negative impact of late sowing on spring wheat, noting that changes in temperature regimes resulted in a decrease in the number of spikelets per spike and the weight of 1000 grains, leading to a reduction in yield [11].

In cereal crops, the weight of 1000 grains is a characteristic feature of the variety and can partially change based on various agrotechnical measures. In our studies, for early sowing with a rate of 3.0 million seeds, the weight of 1000 grains was 42.7 g for the Bahor-1 variety, 44.4 g for the Janub Gavhari variety, and 44.1 g for the Navruz variety. For variants sown at 3.5 million seeds, it was 42.1 g for Bahor-1, 43.5 g for Janub Gavhari, and 41.0 g for Navruz. When sown at 4.0 million seeds, the weight was 39.7 g for Bahor-1, 42.6 g for Janub Gavhari, and 41.3 g for Navruz (Table 1).

Table 1

Effect of sowing rates and timing on the thousand-grain weight of spring soft wheat varieties

T/p	Planting time	Sowing rate, million seeds/ha	Bahor-1	Janub gavhari	Navruz
1	Early period (February 20-28)	3,0	42,7	44,4	44,1
2		3,5	42,1	43,5	43,0
3		4,0	39,7	42,6	41,3
4	Medium term (March 1-10)	3,0	45,4	44,3	42,8
5		3,5	42,5	42,3	40,5
6		4,0	41,4	41,5	39,6
7	Extended deadline (March 10-20)	3,0	41,3	43,3	42,7
8		3,5	40,7	42,0	41,0
9		4,0	39,3	39,0	38,6

The weight of 1000 grains for the studied varieties was determined as follows: In the medium sowing period: - For 3.0 million seeds per hectare: Bahor-1 variety - 45.4 g, Janub Gavhari variety - 44.3 g, Navruz variety - 42.8 g. - For 3.5 million seeds per hectare: Bahor-1 variety - 42.5 g, Janub Gavhari variety - 42.3 g, Navruz variety - 40.5 g. - For 4.0 million seeds per hectare: Bahor-1 variety - 41.4 g, Janub Gavhari variety - 41.5 g, Navruz variety - 39.6 g. In the late sowing period: - For 3.0 million seeds per hectare: Bahor-1 variety - 41.3 g, Janub Gavhari variety - 43.3 g, Navruz variety - 42.7 g. - For 3.5 million seeds per hectare: Bahor-1 variety - 40.7 g, Janub Gavhari variety - 42.0 g, Navruz variety - 41.0 g. - For 4.0 million seeds per hectare: Bahor-1 variety - 39.3 g, Janub Gavhari variety - 39.0 g, Navruz variety - 38.6 g.

In conclusion, it can be stated that the weight of 1000 grains of spring soft wheat varieties studied in the southern regions of the republic (under the conditions of the Karshi district of Kashkadarya region) varied from 39.3 g to 45.4 g for the Bahor-1 variety. The highest indicator was observed to be 45.4 g when seeds were sown at a medium-term planting date with a seeding rate of 3.0 million units per hectare.

It was noted that in the South Gavhari variety, the weight of 1000 seeds varied from 39.0 g to 44.4 g, with the highest recorded value of 44.4 g achieved when seeds were sown early at a rate of 3.0 million seeds per unit area.

In the Navro'z variety, the weight of 1000 seeds ranged from 38.6 g to 44.1 g. The highest value of 44.1 g was observed when seeds were sown early at a rate of 3.0 million seeds per unit area. It was demonstrated that the 1000-seed weight is a characteristic feature of this variety.

It has been determined that increasing the seeding rate of spring soft wheat seeds leads to a decrease in the weight of 1000 grains, which can be explained by the plant's dependence on its feeding area.

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