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INFLUENCE OF SOWING RATES OF SEEDS AND MINERAL FERTILIZERS ON YIELD OF DURUM WHEAT VARIETIES UNDER LIGHT GRAY SOILS

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ABSTRACT

The article shows the sowing rates of seeds and mineral fertilizers on the yield of durum wheat varieties Krupinka, Zilol and Nasaf. The highest grain yield of durum wheat was observed in varieties Zilol (59.6 c/ha) and Nasaf (60.7 c/ha) when nitrogen fertilizers N180P90K60 kg/ha were applied with a seeding rate of 4 million seeds, in the variety Krupinka (56.9 c/ha) with a seeding rate of 5 million seeds, and when applying nitrogen fertilizers N210P90K60 kg/ha.

KEYWORDS: *Variety, Krupinka, Zilol, Nasaf, Durum Wheat, Sowing Rates, Fertilizer, Productivity.*

INTRODUCTION

Wheat is one of the most widespread agricultural crops in the world. Its grain contains almost all substances (proteins, carbohydrates, minerals, etc.) necessary for the normal development of the human body. Wheat bread has high taste and nutritional properties, is well digested and absorbed by the body. Wheat grain is also used in the cereal, pasta and confectionery industries. It is the staple food for 35% of the world's population and provides about 20% of the population's energy needs [1].

According to N. Umirov et al., when sowing seeds of winter wheat at the rate of 4.0-4.5 million germinating seeds/ha in the optimal period and 4.5-5.0 million germinating seeds/ha in the late period in autumn, top dressing nitrogen fertilizers in late February-early March at the rate of 60-70 c/ha, in the phase of entering the tube-earing 75-80 c/ha, allows you to get the planned yield of 70-75 c/ha [2].

According to the results of N.M. Turdieva, in the conditions of irrigated meadow-gray soils of the Samarkand region, sowing in the second decade of October of intensive types of biological two-handled (optional) durum wheat variety Istiklol with a sowing rate of 4.0 million pcs/ha of viable seeds and 5.0 million pcs/ha of Alexandrovka variety provides a high productivity [3].

P.Kh.Bobomirzaev notes that sowing dates also affect sowing rates. With a delay in sowing from the optimal time, the sowing rate increases. In plants sown late, seed germination coefficient is low, resistance to unfavorable autumn-winter conditions is low [4].

Hard wheat (Triticum durum) is one of the most important food crops around the world, producing 36 million tons of grain annually. Durum wheat is mainly grown in the Mediterranean basin, the southeastern United States and the northern plains of Canada, the desert regions of northern Mexico, and many other regions.

In 2020-2021, a slight increase in durum wheat grain production is expected in the world. US production increased by 12% per year. In 2019-2020, the European Union, Spain and Greece were the countries with the highest levels of production. In other countries, there is a reduction in production. Production in Italy has dropped sharply. Production is also declining in North Africa. Morocco, Tunisia and western Algeria, where dry conditions are experienced and durum wheat production has declined as a result.

This has led to a reduction in the area under durum wheat in many countries.

The world wheat market receives 120-140 million tons of wheat annually, and the United States, Australia, Canada, Argentina, the European Union, Russia, Kazakhstan and Ukraine play an important role in this market. Most of the world's wheat exports are produced by these 8 countries. The United States ranks first among them.

From 1950 to 1990, production greatly increased productivity through a combination of genetic improvement and new agronomic practices.

Nitrogen consumption has increased nine-fold since the 1960s, and scientists predict it could increase another 40 to 50 percent in the coming years. Today, in many foreign countries, research is being carried out to improve agricultural technologies and to grow high-quality durum wheat, which is one of the most urgent problems.

Over the past five years, one of the brightest features of the current modernization strategy of Uzbekistan in the country is the diversification of agriculture, further strengthening food security and expanding the production of environmentally friendly products. Through the introduction of efficient production technologies and strengthening the material and technical base of farms and clusters, 7 million 130 thousand tons of grain were grown in 2019.

Within the framework of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030, special attention is paid to "... the introduction of effective mechanisms for managing water resources, water use and water consumption, the introduction and rational use of fertilizers to preserve and increase soil fertility." In this regard, it is of great importance to conduct scientific research to improve the optimal agricultural technologies for growing import-substituting and export-oriented durum wheat on irrigated lands.

Conducted research, foreign and domestic literature, the role of durum wheat in the national economy and cultivation technologies, the impact of sowing rates on grain yield and quality of durum wheat, the effect of nitrogen fertilizer rates on grain quality, the effect of irrigation on valuable economic characteristics of durum wheat Many foreign and domestic the scientists reviewed the literature based on numerous recommendations for composition, experimental placement, and phenological observations.

A study in light gray soils of the Kashkadarya region shows that at a seed sowing rate of 4 million pieces per hectare, with the application of the norm of fertilizer $N_{150}P_{90}K_{60}$, the average yield for three years was 43.7 centners per hectare for the Krupinka variety, and 47.1 centners / ha for the Zilol variety and for the variety Nasaf 48.3 centners / ha. With an increase in the sowing rate by 5 mln. 45.8 c/ha, toyst with an increase in the sowing rate, an increase in yields were aside the error of experience.

The conducted research shows that with an increase in the norm of mineral fertilizers, the productivity of durum wheat varieties increases markedly. At the norm of fertilizer $N_{180}P_{90}K_{60}$ in the Krupinka variety, when sowing 4 million seeds per hectare, the average three-year yield was 55.2 centners per hectare, or 11.7 centners per hectare higher than when compared with $N_{150}P_{90}K_{60}$. Accordingly, the Zilol variety had 59.6 centners/ha and 12.5 centners/ha, and the Nasaf variety had 60.7 centners/ha and 12.4 centners/ha. The same trend as in varieties with an increase in the sowing rate of seeds, an increase in yield, were aside the error of experience.

TABLE 1 INFLUENCE OF SEEDING RATES AND NITROGEN FERTILIZERS ON GRAIN YIELD, C/HA (2018-2020)

№	Fertilizerrate kg/ha	Seeding rate	Variety name	2018 year	2019 year	2020 year	Average
1	$N_{150}P_{90}K_{60}$	4 million pieces	Krupinka	41,6	46,6	42,8	43,7
2			Zilol	45,8	48,8	46,8	47,1
3			Nasaf	47,7	49,1	48,2	48,3
4		5 million pieces	Krupinka	43,9	47,7	44,8	45,5
5			Zilol	47,6	49,2	48,9	48,6
6			Nasaf	48	50,2	49,1	49,1
7		6 million pieces	Krupinka	44,4	47,8	45,1	45,8
8			Zilol	48,7	49,6	49,4	49,2
9			Nasaf	50,7	50,7	51,2	50,9
10	$N_{180}P_{90}K_{60}$	4 million pieces	Krupinka	52,3	59,2	54,2	55,2
11			Zilol	57,5	62,3	59,1	59,6
12			Nasaf	58	64,2	60	60,7
13		5 million pieces	Krupinka	54,7	60,1	56	56,9
14			Zilol	58,3	64,6	60,5	61,1
15			Nasaf	59,7	65,9	61,2	62,3
16		6 million pieces	Krupinka	55	61	57,5	57,8
17			Zilol	59,6	67,9	61	62,8
18			Nasaf	61,3	68,9	63,4	64,5
19	$N_{210}P_{90}K_{60}$	4 million pieces	Krupinka	56,5	64,9	59,8	60,4
20			Zilol	59,7	69,7	63,2	64,2
21			Nasaf	60	70,7	65,7	65,5
22		5 million pieces	Krupinka	57,4	65,9	60,2	61,2
23			Zilol	62,2	70,5	64,3	65,7
24			Nasaf	62,4	71	66,6	66,7
25		6 million pieces	Krupinka	56,9	66,9	61	61,6
26			Zilol	60	71	65,2	65,4
27			Nasaf	61,9	72,1	68,6	67,5

Experienceerror	**$S_{x=}$**	**1,14**	**1,15**	**1,29**	**X**
AverageDifferenceError	**$S_{d=}$**	**1,61**	**1,63**	**1,82**	**X**
Least significant difference, c/ha	**$LSD_{05=}$**	**2,98**	**3,01**	**3,37**	**X**

At the norm of fertilizer $N_{210}P_{90}K_{60}$ in the Krupinka variety, when sowing 4 million seeds per hectare, the average three-year yield was 60.4 c/ha, or 16.7 c/ha higher than when compared with $N_{150}P_{90}K_{60}$. and 5.2c/ha vs. vs. $N_{180}P_{90}K_{60}$. Accordingly, the Zilol variety has 64.2 c/ha and 17.1 c/ha higher than when compared with $N_{150}P_{90}K_{60}$. and 4.6 c/ha vs. vs. $N_{180}P_{90}K_{60}$. and in variety Nasaf this figure was 65.5 c/ha and 17.2 c/ha ha higher than when compared with $N_{150}P_{90}K_{60}$. and 4.8 c/ha compared to $N_{180}P_{90}K_{60}$..The same trend persisted in other variants with an increase in the seed sowing rate.

When studying the effect of seed sowing rates and the application of nitrogen fertilizers on the grain yield of durum wheat varieties under the conditions of irrigated light gray soils of the Kashkadarya region, the effectiveness of using a high agricultural background was determined. For example, at a fertilizer application rate based on $N_{180}P_{90}K_{60}$ kg/ha, the seed sowing rate for local varieties was 4 million seeds, and for foreign varieties 5 million seeds, and at a fertilizer application rate based on $N_{210}P_{90}K_{60}$ kg/ha, vice versa, for local varieties 5 million pieces, and for foreign varieties 4 million pieces, (table 1).

When studying the interaction of sowing rates and the application of nitrogen fertilizers on the technological quality of durum wheat grain, it provided a high nature of grain against a high background of nitrogen fertilizers, and an increase in sowing rates led to a decrease in grain yield.

In the variant with the application of nitrogen fertilizers at the rate of 150 kg/ha, the weight of 1000 grains was 39.5-44.1 g, with the application of 180 kg/ha - 41.5-46.2 g, with the application of 210 kg/ha 43.5 -47.6 g. According to the results obtained, it was determined that with an increase in mineral nutrition, an increase in the weight of 1000 grains was observed, and with an increase in seeding rates, a decrease in this indicator.

CONCLUSIONS

1. When applying nitrogen fertilizers at the rate of $N_{210}P_{90}K_{60}$ kg/ha to $N_{150}P_{90}K_{60}$ kg/ha, the vegetation period of varieties was 223-231 days. Experiments have shown that an increase in the application rate of nitrogen fertilizers for every 30 kg/ha ensures the full growth and development of plants and prolongs the development period by 2-3 days.
2. The highest grain yield of durum wheat varieties was observed in varieties Zilol (59.6 c/ha) and Nasaf (60.7 c/ha) when nitrogen fertilizers $N_{180}P_{90}K_{60}$ kg/ha were applied with a seeding rate of 4 million pieces, seeds, in the variety Krupinka (56.9 c/ha) with a seeding rate of 5 million seeds, and when applying nitrogen fertilizers $N_{210}P_{90}K_{60}$ kg/ha, on the contrary, in local varieties (65.7 - 66.7 c/ha) with a seeding rate of 5 million seeds , seeds and in the foreign variety Krupinka (61.6 kg / ha) with a seeding rate of 4 million seeds.
3. For local varieties Zilol and Nasaf when applying nitrogen fertilizers $N_{180}P_{90}K_{60}$ kg/ha, the seeding rate is 4 million pcs, 5 million pcs, for the foreign variety Krupinka and vice versa 5

million pcs, seeds when applying mineral fertilizers with the norm $N_{210}P_{90}K_{60}$ kg/ha for local varieties and 4 million pieces for the foreign variety Krupinka.

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