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# LABORATORY AND FIELD FERTILITY OF RICE VARIETIES SEEDS

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**Annotation:** Under laboratory conditions, seed germination and grass strength is much higher. Sowing seeds affect the temperature of water and air. At low temperatures, seeds slowly absorb water, causing the seeds to fall from the cornea and slow down the growth process. The seeds are sown at the beginning of the process, and their wheat flourishes, occasionally sprouting grass. However, sowing seeds early will lead to relatively high yields. This is explained in such a way that every plant that grows from seeds that grows in the early stages is particularly productive, resulting in a volume of space in the field. Sowing grain at night results in poor performance. This is mainly due to adverse weather conditions.

**Keywords:** rice, germination, thermostat, sowing date, temperature, variety, seed, grain, petri dish, percentage, sowing rate.

**Introduction.** The world's population consumed 78% of the total rice production in 2014. Rice is the staple food for more than 3.5 billion people. Therefore, experts predict that rice consumption will not decline in the future, especially in Africa and Asia. According to data from 2016-2017, approximately 144 million tons of rice were consumed by the Chinese population. According to medical standards, the per capita consumption of rice is 54.2 kg per year, but in practice this figure is 53.7 kg..[1]

As a result of the reforms carried out in the agrarian sector in our republic, comprehensive measures are being taken to introduce resource-saving technologies in farming, reduce cotton areas and grow rice as the main and repeated crop, and establish rice seed production in each region, expand the cultivated areas and continuously provide the population with this product. However, not enough attention has been paid to scientific research on determining optimal planting dates and standards for newly created rice varieties.

Based on the above, laboratory and field experiments were conducted to study the effect of seed germination on the growth and yield of rice varieties.

The life stages of a rice plant, like other annual cereals, are characterized by changes in growth and development that occur in a series of sequential stages. These changes are observed in a complex relationship with the age of the plant and the processes that occur with the formation of organs [4, -27 p.]

After sowing the seed, under the conditions of a certain sequence of temperature, humidity, and the presence of an optimal amount of mineral nutrients and other factors in the soil, the rice plant goes through a number of successive stages. During the same period, various organs that

[1]www.statista.com

determine the productivity of the plant are formed. The growing season and the duration of each stage, as well as the varietal characteristics of the plant, are closely related to the climatic conditions of the spring-summer-autumn periods. The more favorable the conditions for the growth and development of the plant, the longer it grows and passes all its life stages in a normal state. On the contrary, when unfavorable conditions occur, the plant quickly completes each stage of development, that is, the duration of each stage is short and the yield indicators are low [1, -43 p.]

In the research conducted by the breeder scientist T.E. Isakov at the Uzbekistan Rice Research Institute in 1971, the laboratory and field fertility of the "UzROS-7-13" variety was determined to be 58 percent, while in the control variant, the planting rate (200 kg, 350 kg, 500 kg) led to a decrease in the variants with an increased yield of 46-50 percent [6, -70 p.]

T.V. Ivanov [3, -229 p.] In his experiments conducted in 2005-2007, it was observed that the field fertility of varieties varied depending on the planting rate, and in 4 million (up to 35.6-38.8 percent) in 5 million (up to 34.5-36.6 percent), 6 million (up to 33.4-34.3 percent) [2, -54-55 p.].

In scientific research conducted by scientists of the Uzbek Rice Research Institute in 1973-1974, data were provided that the field germination of rice was 32-58% [5, -73 p.]. The germination rate of seeds in field conditions is much lower than in laboratory conditions. This indicator depends on the quality of the seeds, soil temperature and humidity at the time of sowing, seed sowing depth, and agricultural technology.

Monitoring the growth and development of rice plants, assessing the early maturity of different varieties and hybrids, conducting technological processes taking into account the growth period between phases, the dynamics of stem growth, the timing of dry mass accumulation and harvesting for grain allows you to draw up a calendar plan for the study.

When the germination of seeds is low, it is necessary to determine their viability (for a short time). This method is used for seeds that germinate slowly, and when germination is determined by simple methods, the seeds remain dormant. Various dyes are used to determine viability - tetrazole, indigo carmine or fuchsin. A 0.5% solution of tetrazole stains the living germ cells of the seed red, while a 0.1% solution of indigo carmine and acid fuchsin turns the dead germ cells blue [2, -55 p.]

**Research results**: According to the data in Table 1, the germination of late-maturing rice seeds of the “UzROS-7-13” variety, determined in laboratory conditions by placing 100 grains per Petri dish in a thermostat at a temperature of 20-30º C (30º C for 6 hours, 20º C for 18 hours), was 98.2 percent, and for the “Lazurniy” variety, this indicator was 98.6 percent.

Undoubtedly, at relatively high temperatures, the germination of rice seeds is accelerated [6, -25b.]. In this regard, it can be said about the optimal sowing dates that the period at which the temperature at which the germination rate of plants is high can be considered the optimal sowing date.

When observing the field germination of seeds in the years of the study, the field germination of the control "UzROS-7-13" variety, when sown in the Tashkent region at 4, 5, 6 (control) million units/ha during the April 25 planting period, was 55.7-56.3 percent, which was 1.3-2 percent lower than the field germination of seeds sown during the May 5-15 period (57.3-57.7 percent) and during the May 15 period (57.3-58.0 percent).

**1-Table**

**Laboratory germination and seed performance of late-maturing rice varieties (2020-2023)**

| Rice varieties | Number of grains in 1 Petri dish, pcs. | Laboratory germination of seeds at a temperature of 20-30ºC, percent | | | |
|---|---|---|---|---|---|
| | | 7 - day | 8 – day | 9 - day | 10 – day |
| «UzROS-7-13» (2020-2023) | 100 | 96,2 | 97,0 | 97,6 | 98,2 |
| «UzROS-7-13» (1980-1990) | 100 | 97.1 | 97,7 | 98,2 | 98,7 |
| Difference | | -0,9 | -0,7 | -0,6 | -0,5 |
| «Lazurniy» | 100 | 96,5 | 97,3 | 97,9 | 98,6 |
| (2020-2023) | 100 | 96.7 | 97.4 | 98.0 | 98,8 |
| « Lazurniy» | | -0,2 | -0,1 | -0,1 | -0,2 |

When determining the field yield of the "Lazurniy" variety under study in the Tashkent region at all three planting dates and rates, the control planting date was 25 April, when 4, 5, 6 (control) million units/ha were planted, the yield was 56.3 percent, and on 5 May, it was 57.7 - 58.0 percent. The highest yield in the experiment was observed at 15 May, when the planting rate was 4, 5, 6 million units/ha, it was 60.3 - 60.7 percent.

When determining the field germination of seeds in the years of the study, it was found that when the control variety "UzROS-7-13" was sown in the conditions of the Khorezm region at a sowing date of April 30 at 4, 5, 6 (control) million units/ha, the germination was 54.7-55.0 percent, which was 1.3-2.0 percent lower than when the sowing dates of May 10-20 were (56.3) percent, and when the sowing date of May 20 was (57.3-57.7) percent.

The germination of the "Lazurniy" variety studied in the experiment was 55.0-55.3 percent when the sowing date of April 30 at 4, 5, 6 (control) million units/ha, 55.7-57 percent on May 10, and 57.3-58.0 percent on May 20. This, in turn, was observed that the difference between the sowing rates at the May 10 sowing date was 0.7-1.0 percent less than the control option. It was found that the difference between the sowing rates at the May 20 sowing date was 2.3-2.7 percent more than the control.

The soil and climatic conditions of the Tashkent and Khorezm regions of our republic affected the laboratory and field germination of seeds of the late-ripening rice varieties "UzROS-7-13" and "Lazurniy". That is, the sowing dates of these varieties on May 5 and 15, when the sowing rate was 5.6 million units per hectare, achieved the highest field germination (in the Tashkent region, the "UzROS-7-13" variety was 57.3-58.0 percent and "Lazurniy" - 58.3-60.7 percent.

**2-Table**

**Field germination and number of sprouted plants of late-maturing rice varieties (2012-2014)**

| Sowing quantity, grains/ha | Sowing period | Field yield, percent | Number of plants per 1 m2 | Sowing period | Field, forgetfulness, interest | Number of plants per 1 m2 |
|---|---|---|---|---|---|---|

| Tashkent region | | | | Khorezm region | | |
|---|---|---|---|---|---|---|
| "UzROS-7-13" | | | | | | |
| 4mln | 25. IV (control) | 55,7 | 222,8 | 30.IV (control) | 54,7 | 218,8 |
| 5mln | | 56,3 | 281,5 | 10.V | 54,7 | 273,5 |
| 6mln(control) | | 56,0 | 336,0 | | 55,0 | 330,0 |
| 4mln | 05.V | 57,3 | 229,2 | 20.V | 56,3 | 225,2 |
| 5mln | | 57,7 | 288,5 | | 56,3 | 281,5 |
| 6mln | | 57,3 | 343,8 | | 56,3 | 337,8 |
| 4mln | 15.V | 57,3 | 229,2 | "Lazurni" 30.IV | 57,7 | 230,8 |
| 5mln | | 58,0 | 290,0 | | 57,3 | 286,5 |
| 6mln | | 58,0 | 348,0 | | 57,7 | 346,2 |
| «Lazurniy» | | | | | | |
| 4mln | 25. IV | 56,3 | 225,2 | 30.IV (control) | 55,0 | 220,0 |
| 5mln | | 56,3 | 281,5 | | 55,3 | 276,5 |
| 6mln | | 56,3 | 337,8 | | 55,3 | 331,8 |
| 4mln | 05.V | 57,7 | 230,8 | 10.V | 55,7 | 222,8 |
| 5mln | | 58,3 | 291,5 | | 57,0 | 285,0 |
| 6mln | | 58,0 | 348,0 | | 56,3 | 337,8 |
| 4mln | 15.V | 60,3 | 241,2 | 20.V | 57,3 | 229,2 |
| 5mln | | 60,7 | 303,5 | | 58,0 | 290,0 |
| 6mln | | 60,3 | 361,8 | | 58,0 | 348,0 |

The soil and climatic conditions of the Khorezm regions affected the laboratory and field germination of seeds of the late-maturing rice varieties "UzROS-7-13" and "Lazurniy". That is, the sowing dates of these varieties

May 10 and May 20, when sowing at a rate of 5.6 million units per hectare, showed the highest field germination (56.3-57.0 percent and 58.0 percent, respectively, in the Khorezm region), forming the largest number of plants per hectare.

From the data obtained, it can be concluded that the sowing dates significantly affected the field germination. That is, in experiments conducted in the Tashkent and Khorezm regions, the germination of seeds sown in late terms was 1.5-2.0 percent higher than that sown in early terms. This can be explained by the rapid germination of seeds due to the relatively high air temperature in the late terms.

Many scientists, including N.I. Valilov, N.N. Kuleshov and others, recommended that grain crops be grown in areas with good soil and climatic conditions. The results of experiments conducted in different regions showed that the Southern regions have higher seed germination than the Northern regions. In addition, the most important factors affecting the quality of seeds are: temperature, water supply during the growth period of the plant, length and shortness of the day, soil properties, etc. It was found that in the climatic conditions of the Tashkent region, field germination was 1-1.5 percent higher in all studied sowing periods compared to the climatic conditions of the Khorezm region. In our opinion, it is possible that the salinization of the soils of the Khorezm region negatively affected the field germination of seeds [2, -54-55 p.]

**Conclusion**: Sowing rates did not significantly affect the field germination of seeds, but it was found that when the sowing rate was sown at an early date, germination was lower than when sown at a late date. Field experiments conducted in both regions of our republic clearly demonstrated this.

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