

The Number of Grains in a Head of Early-Maturing Long-Rice Varieties with High Rice Productivity

Turopova Mashxura Roxataliyevna

Assistant Doctoral Researcher, Scientific Research Institute of Rice Cultivation
mashxuraturopova@gmail.com

Received: 2025, 15, Oct

Accepted: 2025, 21, Nov

Published: 2025, 19, Dec

Copyright © 2025 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).



Open Access

<http://creativecommons.org/licenses/by/4.0/>

Annotation: This article presents the results of scientific research conducted on the topic of indicators of the number of grains in the panicle of early-ripening long-ripening rice variety samples with high rice yields (in 2024), the results of studies conducted on 80 long-ripening rice variety samples selected from the gene pool of the Rice Research Institute, according to which an analysis of the results of studies on the indicators of total grains based on empty grains in the panicle and whole grains of the varieties is presented.

Keywords: Rice gene pool, rice varieties and samples, panicle, number of empty grains in the panicle, number of whole grains in the panicle, indicators of the total number of grains in the panicle.

Today, the decrease in the amount of water reserves around the world, as well as global climate change, pose a huge threat to the agricultural sector, including food security. Therefore, the creation of new varieties capable of adapting to climatic conditions, as well as the development and implementation of advanced and resource-saving technologies for rice cultivation on a scientific basis, is one of the important issues. In this regard, the adoption of a number of resolutions and decrees on this issue throughout the world, including in our country, is clear evidence of the attention paid to the sphere.

Among such decrees are the Decree of the President of the Republic of Uzbekistan dated February 2, 2021 No. PP-4973 "On Measures for the Further Development of Rice Growing" and the Decree of the President of the Republic of Uzbekistan dated July 2, 2025 No. 410 "On Additional

Measures for the Uninterrupted Provision of the Population of the Republic with Rice Products." In this regard, the Rice Research Institute, in cooperation with scientific organizations of a number of foreign countries, along with conducting various environmental tests with foreign and local varieties and samples, provides for the introduction of practices for conducting research on crosses based on their correspondence to various traits and characteristics based on local varieties and samples. [3] [4]

In this regard, a special task is assigned to breeders. One of the main tasks of breeding science is organizing the creation of varieties that are better than each variety being planted and tested for the purpose of planting and introducing various crops into the production process, and thereby introducing them into production. [5]

Indica have a thin, narrow, and elongated shape, and the ratio of grain length to grain width is 3:1 or more. It can be observed that varieties of this type, that is, rice varieties with long rice, are mainly distributed in tropical regions.[6,7]

Long rice varieties have been extensively studied in Asia, Australia, North and South America, and a number of practical works have been carried out on the issue of introducing them into production. In breeding work, taking into account the quality indicators of grain, great attention is paid to increasing the amount of protein in rice. [8]

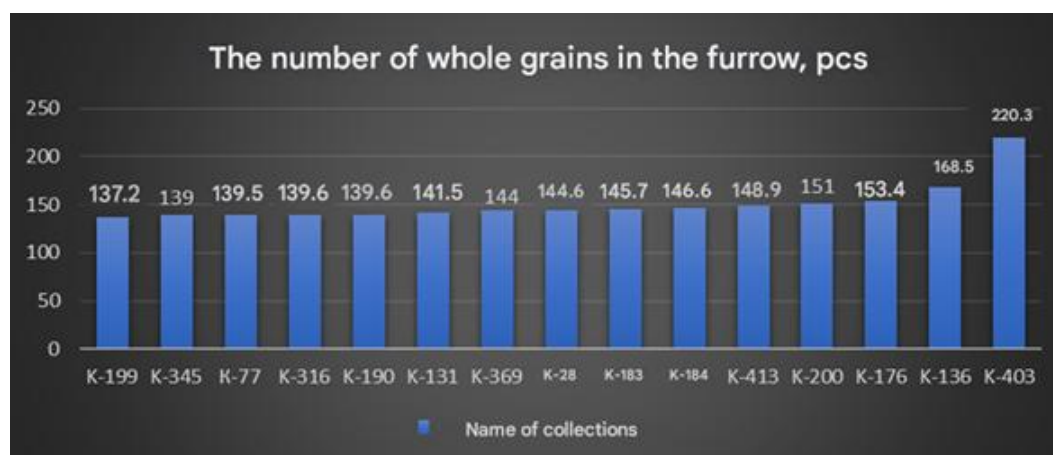
Research Methods. The research was conducted directly based on scientific methods developed by the International Rice Research Institute (IRRI), as well as various recommendations for conducting field experiments and laboratory experiments.[9]

Rice breeding was carried out mainly on the creation of new varieties of agricultural crops, based on generally developed methods and techniques, as well as the methodology of the State Commission for Variety Testing of Agricultural Crops[11]. Statistical analysis of the results of the conducted experiments was carried out according to the method of B.A. Dospekhov [10].

Analysis and results. Initial work on the topic was carried out based on the above methods. From more than 400 collections available at the Rice Research Institute, 80 long-growing rice samples were selected and their germination indicators were studied under laboratory conditions. The "Sitara" variety was selected as the standard variety for long rice samples. All planted samples were compared and studied with our standard variety.

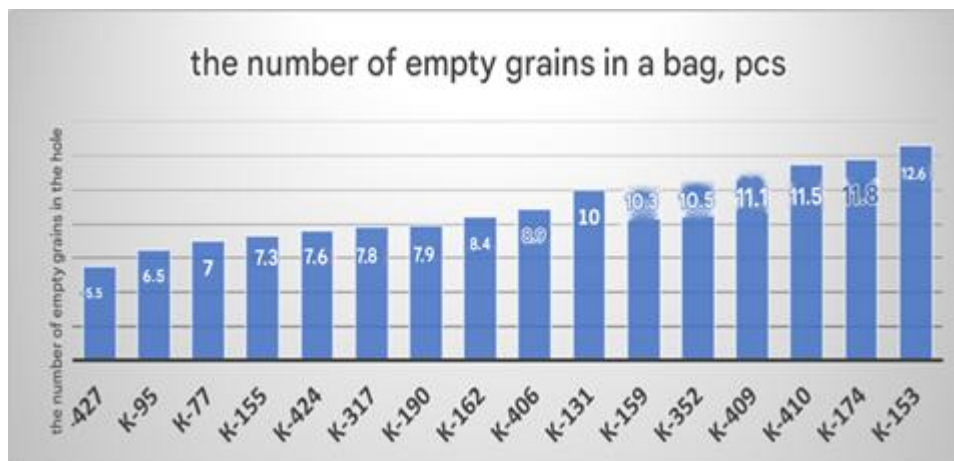
The conducted research showed that the number of empty, whole, and total grains in each panicle was studied, and the high-yielding ones were recommended for use in the breeding process of high-yielding varieties and samples the following year. As shown in the table below, K-403 (220.3), K-136 (168.5), K-176 (153.4), K-200 (151), K-413 (148.9), K-184 (146.6), K-183 (145.7), K-28 (144.6), K-369 (144), K-131 (141.5), K-190 (139.6), K-316 (139.6), K-77 (139.5), K-345 (139), K-199 (137.2) were recommended as high-yielding variety samples.

(Graph 1). Number of whole grains in a panicle, pcs



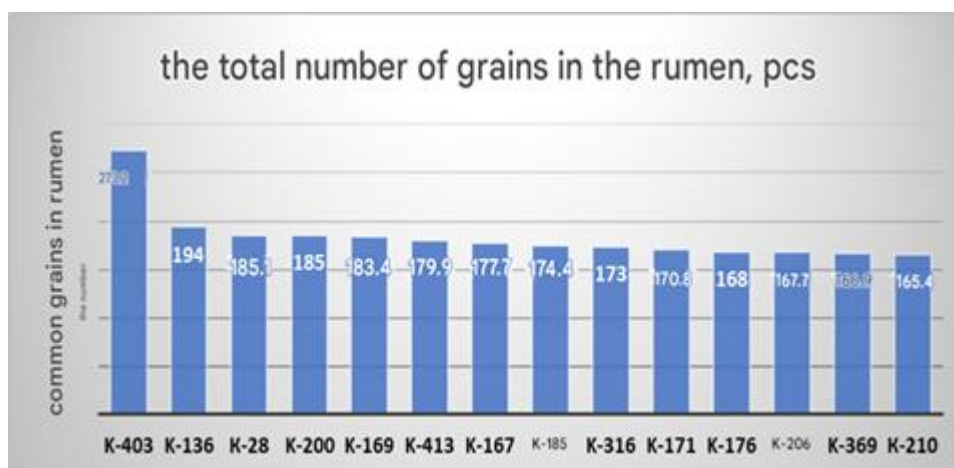
The results of studies on the indicators of hollow grains also show that the higher the number of hollow grains, the later this variety-sample ripens or is not suitable for recommendation. The large number of empty grains in the panicle indicates whether this variety-sample is recommended for the next year or not. In the diagram below, the number of empty grains in the panicles is arranged in ascending order.

Diagram 2. Number of empty grains in a panicle



The total number of grains in the panicle is calculated as the sum of the total number of whole and empty grains in the panicle, and the average of the total number. High-yielding varieties and samples are selected and used in the breeding process for the next year. In particular, K-403 (273.2), K-136 (194), K-28 (185.1), K-200 (185), K-169 (183.4), K-413 (179.9), K-167 (177.7), K-185 (174.4), K-316 (173), K-171 (170.8), K-176 (168), K-206 (167.7), K-369 (166.9), K-210 (165.4) showed high yields and recommendations for further use in the breeding process were presented.

Diagram 3. Total number of grains in the panicle, pcs



Conclusion

The number of grains in each panicle is one of the indicators that determines its yield. Rice varieties with a high number of grains in the panicle are selected and recommended for planting next year. In this case, of course, the coefficient of empty grains is also of great importance, because the earlier the plant ripens, the fewer empty grains it has. When studying the number of grains in the panicles, it was established that K-403 (273.2), K-136 (194), K-28 (185.1), K-200 (185), K-169 (183.4), K-413 (179.9), K-167 (177.7), K-185 (174.4), K-316 (173), K-171 (170.8), K-176 (168), K-206 (167.7), K-369 (166.9), K-210 (165.4) have high yields and can be recommended for further use in the breeding process.

References

1. Resolution of the President of the Republic of Uzbekistan dated February 2, 2021 No. PP-4973.
2. Decree of the President of the Republic of Uzbekistan dated July 2, 2025 No. 410 "On Additional Measures for the Uninterrupted Provision of the Population of the Republic with Rice Uzbekistan Products."
3. E.T. Ostanaqulov Fundamentals of Breeding and Seed Production Tashkent "Ilm-Ziyo"-2013
4. M.A.Sattarov Rice Growing Tashkent "Lesson Press" -2023
5. Abdukarimov D.T. Private Selection T. 2007.
6. D.T.Abdukarimov, T.Safarov, T.E.Ostonakulov. "Fundamentals of Field Crop Selection, Seed Production, and Genetics" Tashkent, Mehnat, 1989.
7. Abdukarimov D.T. Selection and Seed Production of Agricultural Crops. Tashkent. 2002.
8. "Methods of Conducting Field Experiments" Tashkent-2014
9. B. A. Dospekhov "Methods of Field Experiments." Moscow, "Kolos" 1979.
10. Aleshin E.P. Handbook of Rice Growers. Moscow: Kolos, 1980.
11. "Plant Science" practical classes Andijan-2006