EVALUATION OF TECHNOLOGICAL QUALITY INDICATORS OF RICE SAMPLES

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Abstract. *In this study, rice variety samples were analyzed for technological quality indicators, including head rice yield, broken grain content, and grain translucency. As a result, valuable samples—D-8, D-281, D-425, and D-32—were identified and recommended to breeders.*

Keywords: *rice, variety, selection, grain, technological indicator.*

Introduction

Rice is one of the most consumed cereal crops globally. Due to population growth, the demand for rice continues to rise. Therefore, developing high-yielding and high-quality rice varieties by selecting suitable parental lines, hybridization, and evaluation in selection nurseries is crucial. The geographic and climatic conditions of Karakalpakstan significantly differ from other regions of Uzbekistan, presenting various challenges for rice cultivation. This necessitates identifying and developing varieties highly adaptable to local conditions.

Abiotic stresses—such as drought, extreme temperatures, heavy metals, and salinity—significantly impact plant biochemical processes, growth, and development, ultimately reducing agricultural productivity and food security. Among them, salinity is one of the most critical global factors restricting crop production. Due to Karakalpakstan's harsh soil and climate, the selection of resilient rice varieties is vital for stable crop production. The region also faces water shortages, complicating irrigation and rice farming. Given rice's role as the second most consumed cereal after wheat, with over 50% of the global population depending on it, and considering rising demand, selecting high-yield, resilient, and marketable varieties is of strategic importance.

Materials and Methods

The study was conducted at the Grain and Rice Scientific Production Association. The evaluation followed IRRI (International Rice Research Institute) standards.

- Grain polishing: SKZ 111 B-4 Microcomputer Rice Polisher
- Grain shape: L/W ratio
- Grain appearance: visual assessment
- Weight measurement: digital scales (accuracy ±0.01g)

Formulas:

- Total rice yield (%) = Whole + Broken + Fragments
- Bran content (%) = (Bran weight / 100g) × 100
- Broken rice (%) = (Broken / 100g) × 100
- Head rice yield (%) = (Whole / 100g) × 100

Results and Discussion

Table 1. Technological quality indicators of rice samples selected from the breeding nursery

№	Sample Name	Grain Translucency (%)	Bran Output (g)	Total Rice Yield (g)	Head Rice Yield (g)	Broken Rice (g)	Total Yield (%)	Head Yield (%)
1	Gulistan (std.)	93	29.32	70.68	63.87	6.81	70.68	63.87
2	Sanam (std.)	95	30.9	69.1	53.2	15.9	69.1	53.2
3	D-76	95	22.0	78.0	57.0	21.0	78.0	57.0
4	D-95	92	31.7	68.3	59.0	9.3	68.3	59.0
5	D-32	95	24.2	75.8	63.6	12.2	75.8	63.6
6	D-90	92	28.3	71.7	61.3	10.4	71.7	61.3
7	D-425	96	25.0	75.0	64.8	10.2	75.0	64.8
8	D-8	97	25.3	74.7	70.4	4.3	74.7	70.4
9	D-281	94	22.7	77.3	69.3	8.0	77.3	69.3
10	D-76 (repeat)	95	22.0	78.0	57.0	21.0	78.0	57.0

D-8, D-281, and D-425 demonstrated the best technological performance. D-8 had the highest head rice yield (70.4g) with minimal broken content (4.3g). D-281 showed high total yield (77.3g) and head yield (69.3g), indicating grain integrity. D-425 also performed well (64.8g head, 75.0g total).

Although D-76 had the highest total yield (78.0g), the high broken rice value (21.0g) reduced its head yield. Sanam standard showed moderate performance with higher broken content (15.9g) and lower head yield (53.2g).

Gulistan and D-95 had the highest translucency, desirable for market appeal, but D-95 had higher bran output. Overall, D-8, D-281, D-425, and D-32 are

recommended for breeding and industrial use due to their superior technological qualities.

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