

DRR Dhan 71 - (IET 29421) - An Aerobic Rice Variety

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Abstract

DRR Dhan 71 [IET 29421 (RP 6324-123-14-4-1)], an aerobic rice variety was developed from CR 691-1 × CR Dhan 202. It was evaluated in AICRIP multi-location aerobic rice trials during wet seasons of 2020 to 2022. Consistently outperforming the check varieties in Odisha, Gujarat, and Tamil Nadu, DRR Dhan 71 achieved a mean grain yield of 4870 kg/ha. This yield superiority is evident with a significant increase over the national check (20%), zonal check (38%) and local check (28%). In addition, it exhibited moderate resistance to leaf blast, neck blast, sheath rot, brown spot, rice tungro, sheath blight, plant hoppers, stem borer, gall midge and leaf folder. DRR Dhan 71 has a duration of 120 days (seed to seed) and possesses desirable grain and cooking quality parameters. It was released for cultivation in aerobic ecosystems of Odisha, Gujarat and Tamil Nadu states through Central Sub-committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops vide S.O. 1560(E) dated March 26, 2024 [CG-DL-E-28032024-253429].

Keywords: Aerobic rice, Grain yield, Cooking quality, Direct seeded.

Introduction

Rice (*Oryza sativa* L.) cultivation in India encompasses approximately 22 million hectares under irrigated ecology, accounting for >50% of the nation's total rice production area. In light of the challenges arising from climate change and limitations in water availability and labour resources, there is a collective need to adopt aerobic rice cultivation techniques to secure substantial and reliable crop yields. Recognizing this need, the Indian Institute of Rice Research (ICAR-IIRR) embarked on a focused effort towards aerobic rice cultivation, commencing in 2011 with the cross of CR 691-1 × CR Dhan 202. The resultant segregating populations underwent thorough evaluation under direct seeded aerobic conditions

to propel the advancement of suitable aerobic rice cultivars. The promising line RP 6324-123-14-4-1 was identified and nominated in AICRIP Aerobic trial 2020. Subsequently, the entry performed well in all the three years and released as a direct seeded aerobic rice variety DRR Dhan 71 through Central Sub-committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops vide S.O. 1560(E) dated March 26, 2024 [CG-DL-E-28032024-253429]. It was suitable for cultivation in Odisha, Gujarat and Tamil Nadu states. The overall mean grain yield of DRR Dhan 71 in Odisha, Gujarat, and Tamil Nadu states stood at 4870 kg/ha, marking a marked increase over the national check (20%), zonal check (38%) and



the local check (28%). In Odisha state, the mean grain yield reached 4496 kg/ha, showing a 16% (national check), 22% (zonal check) and 64% (local check) yield superiority. In Gujarat state, the mean grain yield was 4917 kg/ha, indicating a notable increase over the national check (15%), zonal check (38%) and local check (12%). In Tamil Nadu state, the mean grain yield reached 5314 kg/ha, exhibiting a 39%, 68% and 35% increase over the national check, zonal check, and local check, respectively (Table 1).

Table 1: Yield performance of DRR Dhan 71 in Odisha, Gujarat and Tamil Nadu states

States	DRR Dhan 71 (IET29421)	Superiority over checks (%)		
		National Check	Zonal Check	Local Check
Odisha	4496	16	22	64
Gujarat	4917	15	38	12
Tamil Nadu	5314	39	68	35
Overall	4870	20	38	28

The rice variety demonstrated moderate resistance to a range of prevalent diseases and pests, including leaf blast, neck blast, sheath rot, brown spot, rice tungro, sheath blight, plant hoppers, stem borer, gall midge and leaf folder. In contrast to the standard checks and qualifying varieties, it demonstrates admirable hulling

efficiency at 79.85%, milling quality at 71.20% and head rice recovery rate at 64.60%. Additionally, it exhibits intermediate levels of amylose content at 24.75%, an alkali spreading value of 7.0 and a gel consistency of 24 mm. With a medium slender (MS) grain type characterized by a kernel length of 5.72 mm and breadth of 2.06 mm, it also exhibits other desirable grain and cooking quality attributes (Figure 1).

DRR Dhan 71 variety excels in cultivation under dry direct seeded aerobic conditions with intermittent irrigation. The optimal timing for dry direct seeding ranges from the second week of June to the second week of July, coinciding with the onset of rainfall or preceded by pre-sowing irrigation. Immediate post-sowing lifesaving irrigation is essential to ensure uniform germination and crop establishment. Weed management presents a significant challenge in aerobic rice cultivation. To effectively address this issue, Pendimethalin herbicide should be applied at a rate of 1 kg per hectare at field capacity moisture within 3 days of sowing. Additionally, it is advisable to apply a post-emergence, broad-spectrum systemic herbicide like Bispyribac Sodium 10% SC (Nominigold) at a rate of 50 ml per hectare at field capacity moisture within 5-15 days of sowing. One intermittent weeding is recommended during the crop growth period, with the option for two if weed pressure is high.



Figure 1: Field view of DRR Dhan 71 (Left); Paddy, Brown rice and Polished rice of DRR Dhan 71 (Right)



Irrigation should be applied in accordance with the crop's physiological requirements until maturity. DRR Dhan 71 offers a significant advantage with a duration of 113-120 days (seed to seed) compared to transplanted rice varieties. It has the potential to

yield between 5.0-5.5 t/ha when cultivated within the designated area of adoption, recommended climate conditions, and adherence to prescribed agronomic practices. This variety is suitable for direct seeding in both early *kharif* (wet) and *rabi* (dry) seasons.