SHORT COMMUNICATION https://doi.org/10.58297/RVDK3058

Him Palam Dhan 4 (HPR 3201): A Long Grained High-Yielding Rice Variety for Transplanted Irrigated Conditions of Himachal Pradesh and Uttrakhand

Neelam Bhardwaj*, Daisy Basandrai, Dhirendra Singh, Shivani and Surbhi Patyal

Department of Genetics and Plant Breeding, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur-176062

*Corresponding author Email: neenabhardwaj@gmail.com

Received : 17th December, 2025, Accepted: 28th December, 2025

Abstract

Him Palam Dhan 4 (HPR 3201) is a high-yielding, lodging-resistant and fine grained rice variety that has been developed for the Medium Northern Hills' transplanted irrigated conditions. With an average yield of 4429 kg/ha, which is 13.6–16% more than Vivekdhan 86 and 20–72% more than Shalimar Rice 3, the variety consistently outperformed national and regional checks when evaluated as IET 28882 under All India Coordinated Rice Improvement Project (AICRIP) trials conducted at 12 locations between 2020 and 2022. It showed good grain characteristics, such as long, slender grains, 79.2% hulling, 67.7% milling, L/B ratio of 3.30 and amylose content of 25.28%. It also showed moderate resistance to leaf and neck blast and decreased occurrences of stem borer and leaf folder. Its high agronomic performance, pest and disease resistance, and outstanding grain quality make it a potential variety for hill ecosystems.

Keywords: HPR 3201, Blast resistance, Grain quality, Rice

Introduction

Rice (*Oryza sativa* L.) farming in hill regions makes a considerable contribution to regional food supply and farm-based livelihoods, but ecological restrictions often limit crop yields. Cooler growing temperatures, frequent cloud cover, and extended periods of precipitation during the growing season are characteristics of the Medium Northern Hill zone that collectively foster the growth of diseases and pests. These factors collectively contribute to yield reduction and production instability in rice-based systems.

Blast disease, caused by *Magnaporthe oryzae*, is a recurring problem in rice as it can infect plants at several growth stages and produce considerable losses under favorable conditions. Insect pests like leaf folder and stem borer exacerbate production decline by destroying photosynthetic tissues and impeding nutrient transportation. Similarly, grain quality metrics have emerged as essential criteria for varietal acceptability, since milling recovery, grain appearance, and cooking quality have a direct impact on market demand and choice among consumers. Because of the combined effects of these challenges, rice varieties that can sustain production despite the impact of periodic disease and pest stress need to be developed.

To address these challenges, HPR 3201 (HPR 2143 / AC 19146), a high-yielding, lodging-resistant and quality rice variety developed for transplanted irrigated conditions of the Medium Northern Hills at Rice and Wheat Research Centre, Malan, CSK HPKV, followed pedigree selection from segregating generations to identify uniform lines combining high yield, agronomic stability, disease and pest tolerance and superior grain quality. This variety was evaluated as IET 28882 in the All India Coordinated Rice Improvement Project (AICRIP) trials during 2020–2022 at 12 locations along with national and regional checks Vivekdhan 86 (NC), Shalimar Rice 3 (RC) and HPR 1068 (LC).

HPR 3201 consistently outperformed the checks, recording an average yield of 4429 kg/ha compared to 3849 kg/ha and 2489 kg/ha for Vivekdhan 86 and Shalimar Rice 3, respectively, with yield increases over the national check ranging from 13.6% to 16% across the three-year evaluation period (**Table 1 and Figure 1)**. At the state level, yield advantages of 11–19% in Himachal Pradesh and 15–72% in Uttarakhand were observed. HPR 3201 matures in 120–125 days with 90 days to flowering and exhibits resistance to lodging and shattering. Artificial screening under controlled inoculation revealed moderate resistance to leaf and neck blast during 2020–2022 and incidences of leaf folder and stem borer were comparatively lower than in other tested variety *i.e.* TN1 (**Tables 2 and 3)**. Grain quality analysis indicated that HPR 3201 produces long, slender grains with 79.2% hulling, 67.7% milling recovery, a length-to-breadth ratio of 3.30 and amylose content of 25.28% (**Table 4 and Figure 2**). The combination of high yield, agronomic stability, moderate disease resistance, lower pest incidence and superior grain quality contributed to its eventual proposal for identification for transplanted irrigated conditions of the Medium Northern Hills.

Table 1: Mean data for different agro-morphological traits during *kharif* 2020, 2021 and 2022 at RWRC, Malan

Variety	Days to 50 % flowering			Plant height (cm)			Panicles/m^2			Yield (kg/ha)		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
HPR 3201	93	91	98	190.26	104.05	109	334	281	336	3170	5771	4444
Vivekdhan 86	91	90	97	239.22	116.09	109	339	286	286	3795	5721	5061
Shalimar Rice 3	77	84	94	108.67	111.06	108	-	264	200	2641	4117	3849
HPR 1068	86	89	95	198.44	107.62	95	279	297	262	2232	3935	4293

Figure 1: Field View of Rice Variety Him Palam Dhan 4 (HPR 3201)

Table 2: Disease reaction of Him Palam Dhan 4 (HPR 3201) against leaf and neck blast during *kharif* 2020, 2021 and 2022

Sl. No.	Variety	Leaf blast			Neck Blast		
		2020	2021	2022	2020	2021	2022
1	HPR 3201	4	4	3	2	3	7
2	Vivekdhan 86	3	5	3	3	5	3
3	Shalimar Rice 3	4	8	5	7	7	7

Table 3: Reaction to major insect pests at different locations during *kharif* 2022

Entry	Leaf folder Damage (% DL)		Stem Borer Damage		
	MLN (97 DT)	CHT (80 DT)	LDN (90 DT)-%WE	MLN (97 DT)-% DT	PNT (113 DT)-%WE
Prop. Var. Him Palam Dhan 4 (HPR 3201)	16.7	30.3	5.8	16.7	10.6
Check -TN1	19.5	13.5	13.8	0.0	15.1

Table 4: Data on Quality Characteristics

Sl. No.	Variety	Hull	Mill	HRR	KL	KB	L/B	Grain Type	Grain Chalk	ASV	AC	GC
1	**HPR 3201**	**79.2**	**67.7**	**58.6**	**7.07**	**2.14**	**3.30**	**LS**	**VOC**	**3.0**	**25**	**24**
2	Vivekdhan-86	79.8	70.5	67.0	5.80	2.60	2.23	SB	VOC	4.0	24.46	22
3	Shalimar Rice-3	78.5	71.8	70.8	5.46	2.48	2.20	SB	OC	4.0	25.02	22
4	1068	79.3	70.9	68.7	7.12	2.15	3.31	LS	VOC	4.0	24.08	60

Figure 2: Grain Characters of HPR 3201