Two rice hybrids released in Andhra Pradesh, India

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Since 1988, we have been working to develop rice hybrids by using effective local restorer lines. The five top performers (MTU HR 2000, MTU HR 2001, MTU HR 2002, MTU HR 2003, and MTU HR 2008) were tested in farmers' fields throughout Andhra Pradesh, India, during the 1992 and 1993 wet seasons.

Each hybrid was grown in a 500-1000-m^2 plot along with a popular local cultivar as a check. Plants were transplanted at 1-2 seedlings $hill^{-1}$, at a population of 40-45 hills m^{-2}. Local cultural practices were followed.

Of the five hybrids, MTU HR 2003 and MTU HR 2008 performed exceedingly well across locations (see table).

In 1992, MTU HR 2003 produced a 1.1 t ha^{-1} mean yield advantage over the best check (4.8 t ha^{-1}) across 11 locations. In 1993, it produced a 1.3 t ha^{-1} mean yield advantage over the best check (5.8 t ha^{-1}) in six out of seven districts.

MTU HR 2008 performed well at three locations during 1992, with a mean yield advantage of more than 3 t ha^{-1} over the check. During 1993, the same hybrid outperformed the best check (5.7 t ha^{-1}) with a mean yield advantage of 1.3 t ha^{-1}. The hybrid produced maximum yields of 10-11 t ha^{-1}.

The Andhra Pradesh Agricultural University released MTU HR 2003 as APHR 1 and MTU HR 2008 as APHR 2 in December 1993. APHR 1 (IR58025 A/Vajram R) is a medium-duration (130-135 d) hybrid, while APHR 2 (IR62829 A / MTU 9992 R) is short in duration (120 d). Both are tolerant of lodging, intermediate in height, and have long slender grains with good cooking quality. APHR 2 performs well under low inputs and possesses tolerance for bacterial leaf blight. ■

Mean yield performance of MTU HR 2003 (APHR-1) and MTU HR 2008 (APHR-2) in minikit trials. Andhra Pradesh, India. 1992 and 1993 wet seasons.

District	Locations (no.)	Mean yield of hybrid (t ha^{-1})	Mean yield of best check (t ha^{-1})	Yield advantage over the best check (t ha^{-1})
MTU HR 2003 (1992 wet season)				
Warangal	3	7.0	6.2	0.8
Ranga Reddy	2	3.6	2.8	0.9
Kurnool	2	7.8	6.4	1.3
Chittoor	1	7.5	6.0	1.5
East Godavari	2	4.1	3.7	0.4
West Godavari	1	5.3	4.0	1.4
Mean	11	5.9	4.8	1.1
MTU HR 2003 (1993 wet season)				
Nalgonda	2	9.3	6.6	2.7
Ranga Reddy	3	6.3	5.2	1.0
Waragal	3	7.5	6.1	1.4
Kurnool	5	8.1	7.0	1.0
Krishna	5	7.3	5.4	1.9
Guntur	1	5.5	3.9	1.5
West Godavari	3	4.7	4.8	–0.2
Mean	22	7.1	5.8	1.3
MTU HR 2008 (1992 wet season)				
Ranga Reddy	1	10.0	6.5	3.5
Krishna	1	9.4	6.6	2.8
Anantapur	1	10.4	7.5	2.9
Mean	3	9.9	6.9	3.1
MTU JHR 2008 (1993 wet season)				
Nalgonda	2	11.0	6.6	4.4
Ranga Reddy	3	6.4	5.7	1.2
Warangal	3	6.8	5.4	1.4
Kurnool	6	8.1	6.9	1.2
Krishna	6	6.8	5.2	1.5
Guntur	3	6.3	5.9	0.4
West Godavari	4	5.3	4.8	0.5
Mean	27	7.1	6.7	1.3

Performance of hybrid rice in irrigated lowlands, Uttar Pradesh, India

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In the Tarai region of northwestern India, irrigated rice yields are high, with many farmers harvesting 7 t ha^{-1} or more. Hybrid rice varieties, with their higher yield potential, should have a place in these areas.

We evaluated the performance of newly developed hybrid PRH-1 (PMS2A/IR31802) compared with that of high-yielding inbred varieties (Jaya,

Yields of hybrid PRH-1 (PMS 2A/IR31802) and high-yielding inbred rice varieties at two N rates. Pantnagar, India, 1994-95 wet seasons.

Treatment	Grain yield (t ha^{-1})		
	1994	1995	Mean
N rate (kg ha^{-1})			
120	6.4	6.3	6.4
160	7.0	6.6	6.8
SE±	0.1	0.1	
CD(5%)	ns	ns	
Varieties			
PRH-1	7.7	7.1	7.4
Jaya	6.7	6.4	6.5
Pant Dhan 4	6.2	-	6.2
Pant Dhan 10	-	6.0	6.0
Pant Dhan 12	6.3	6.3	6.3
SE±	0.1	0.1	
CD(5%)	0.3	0.3	
Interaction	ns	ns	
CV (%) based on error b	4	4	

Pant Dhan 4, Pant Dhan 10, and Pant Dhan 12) at two N fertility levels.

The experiment was conducted in the 1994 and 1995 wet seasons at Pantnagar, where the soil is a silt loam (Aquic Hapludoll) with pH 7.9, 1.1% organic C, 0.1 % total N, and CEC 20 meq 100 g^{-1} soil.

The experiment was laid out in a split-plot design with three replications. N level (120 and 160 kg N ha^{-1}) was in the main plot and varieties (PRH-1, Jaya, Pant Dhan 4, Pant Dhan 10, and Pant Dhan 12) in the subplots. A single basal dose of 17.5 kg P ha^{-1}, 33.2 kg K ha^{-1}, and 10 kg Zn ha^{-1} was uniformly applied in all plots. N was applied as per treatment in three splits: 1/2 as basal, 1/4 topdressed at active tillering, and 1/4 topdressed at panicle initiation. Twenty-five-day-old seedlings were transplanted on 7 Jul in both years at 20- × 20-cm spacing with 2-3 seedlings $hill^{-1}$.

Varieties did not respond differently to N. An additional dose of 40 kg N (bringing total N to 160 kg ha^{-1}) helped plants yield 7% more grain than at 120 kg N ha^{-1} the reccomended dose for high-yielding inbreds. The difference, however, was not significant (see table).

Hybrid rice PRH-1 yielded significantly more (17% in 1994 and 13% in 1995) than the best-performing inbreds: Jaya (12% less), Pant Dhan 4 (17% less), Pant Dhan 10 (19% less), and Pant Dhan 12 (15% less).

Based on these findings, suitable hybrids can produce 15-20% more than today's best inbred varieties in intensive input systems.■

Routine research. Reports of screening trials of varieties, fertilizer, cropping methods, and other routine observations using standard methodologies to estab lish local recommendations are not ordinarily accepted. Examples are single season, single-trial field experiments. Field trials should be repeated across more than one season, in multiple seasons, or in more than one location as appropriate. All experiments should include replications and an internationally known check or control treatment.

FKR42 and FKR44: irrigated rice varieties released to farmers in Burkina Faso

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Rice varieties IR64 and IR13240-108-2-2-3 were introduced into INERA's breeding program through collaboration with the International Network for Genetic Evaluation of Rice and the West Africa Rice Development Association.

Both varieties proved promising in advanced yield trials in 1992-95 (see table). They also performed well in adaptive on-farm trials under farmers' cultural practices.

The varieties are early-maturing with long, slender grains and are suited for irrigated rice - rice double cropping. Both were released in 1995: IR64 as FKR42 (Farako-Bâ Riz) and IR13240-108-2-2-3 as FKR44.■

Grain yield (t ha^{-1}) in irrigated rice variety trials[a] at the INERA research stations in the Kou and Sourou valleys. Burkina Faso. 1992-95 wet (WS) and dry seasons (DS).

Variety	Kou Valley				Sourou Valley	
	1992 WS	1993 DS	1994 WS	1995 DS	1994 WS	1995 DS
IR64 (FKR42)	4.3	4.3	4.0	2.4	6.1	6.9
IR13240-108-2-2-3 (FKR44)	–	–	4.7	2.8	–	7.7
ITA123 (FKR28)	4.1	2.1	4.3	3.0	3.2	7.7
4456 (FKR16)	4.1	3.1	4.4	2.9	5.4	6.6

[a]Fertilizer rate = 88-69-42 kg NPK ha^{-1}.

Integrated germplasm improvement — upland

Evaluating local germplasm for the upland rice ecosystem in western Nepal

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Upland rice, locally known as *ghaiya dhan* in Nepal, is grown as the major crop in the *tars* (unirrigated ancient river fans), on terraced lands, and on hills where forests have recently been cleared. Most of the 126,000 ha (9% of the country's total rice area) under ghaiya is hilly. Resource-poor upland farmers from ethnic groups such as the Kumal, Derai, and Bote are the main growers of this rice.

Of the 42 rice varieties released in Nepal, only Ghaiya 2 (MV10) is suitable for subtropical upland areas. Hill farmers, however, do not like it because it is short and does not perform well under fertility.

Indigenous ghaiya varieties have not been properly studied or used in variety development programs that could benefit large farming communities.

Researchers at the Lumle Agricultural Research Center have done some preliminary work on evaluating local germplasm. They screened 53 ghaiya land races from Gorkha and Tanahun districts and evaluated them in replicated randomized complete block designs in a target environment (Chyanglitar, 400 m) for two seasons. The crop was broadcast and grown using farmers' practices, except for maintaining a row spacing of 15 cm between the entries. Farmers were involved in ranking the varieties at maturity. Ghaiya varieties that performed poorly during the first year were dropped. Only 24 varieties were tested during the second season.