Table 1. Performance of Majhera 7 and checks in various trials. Uttar Pradesh, India. 1991-94.

Trial/year	Mean yield (t ha^{-1}) in Uttar Pradesh uplands			Yield increase (%) over checks	
	Majhera 7	VL 206 (check)	Majhera 3 (check)	VL 206	Majhera 3
Standard varietal trials					
1991	4.3	3.5	2.9	22.8	48.3
1992	2.2	2.0	1.8	10.0	22.2
1993	1.5	1.0	0.8	50.0	87.5
Mean	2.7	2.1	1.8	23.8	44.4
Station trials					
1992	2.1	1.5	1.5	40.0	40.0
1993	2.0	1.5	1.8	33.3	11.1
1994	1.8	1.6	1.6	12.5	12.5
Mean	1.9	1.5	1.6	26.6	18.7
Adaptive trials					
1992	2.5	-	-	-	-
1993	3.0	3.0	-	-	-
Mean	-	3.0			
Demonstration at research station					
1992	2.0	1.2	1.1	66.6	81.8
1993	2.2	1.8	2.0	22.2	10.0
1994	2.3	2.1	2.0	9.5	15.0
Mean	2.3	1.7	1.7	22.4	29.4
Demonstration in farmers' fields					
1994	2.0	1.7		17.6	
Total mean	2.3	2.0	1.7	15.0	35.3

Table 2. Morphoagronomic character of Majhera 7 and check varieties Majhera 3 and VL 206.

Genotype	Days to flowering	Days to maturity	Plant height (cm)	Panicle length (cm)	Panicles m^{-2} (no.)	Grains panicle^{-1} (no.)	1,000-grain weight (g)	Milling recovery (%)	Grain color
Majhera 3	139	174	104	21.8	198.3	115.2	19.3	78.0	Brown
Majhera 7	139	176	104	22.1	227.7	116.9	20.9	80.0	White
VL 206	139	175	103	22.3	215.8	11.4	20.5	81.0	White

Manuscript preparatIon. Arrange the note as a brief statement of research objectives. a short description of project design, and a succinct discussion of results. Relate results to the objectives. Do not include abstracts. Do not cite references or include a bibliography. Restrain acknowledgments.

Manuscripts must be in English. Limit each note to no more than two pages of double-spaced typewritten text. Submit the original manuscript and a duplicate, each with a clear copy of all tables and figures. Authors should retain a copy of the note and of all tables and figures.

Improved upland rice for the hillsides of Colombia

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The Andean mountain range runs across Colombia from south to north, rising up to almost 6,000 m above sea level (masl). Coffee, grown by small-scale farmers, is the most important agricultural crop in the middle altitudes. Once the coffee is planted, it takes at least 3 yr to start commercial production. In the meantime, farmers use considerable resources to control weeds and prevent erosion. CENICAFE has been working to develop different cropping alternatives to help farmers have income before coffee starts to produce.

CENICAFE, together with the CIAT Rice Program, worked to identify upland rice germplasm suitable for these hillsides. In 1993, we evaluated 21 upland lines at three locations, each replicated three times. in the heart of the coffee-growing area at 1,300 masl. Average temperature ranges from 20.6 to 23.1 °C. The monthly average maximum (28.5 °C) occurs in February and the minimum (16.9 °C) in September. So germplasm must be cold tolerant. Breeding lines were selected for this trial based on results in Africa, where some of their parents performed well.

Only results of the performance of the top six lines grown in trials in La Catalina, Risaralda state, are reported in the tables. The percentage of empty grains ranged from 12 to almost 100%, indicating that the germplasm presents variability for the trait (data not shown). Selection concentrated on the lines with at least 60% fertility. The average grain yield in those lines was higher than originally expected, ranging from 3.8 to 5.6 t ha^{-1} (Table 1). Even though the yield was relatively high, little is known about agronomic management under hilly conditions in Colombia. No checks were used because rice was never before planted in this area.

The growth duration of the lines was extended to around 150 d after sowing, compared with 120 d under acid soil

Table 1. Average data from the best lines in the 1993 observational trial conducted in the coffee-growing area of Colombia, Naranjal Experimental Station, Risaralda.

Line	Panicles (no.)	Tillers (no.)	Grains		Sterile (%)	Quality traits[a]				Yield (t ha^{-1})
			Filled (no.)	Empty (no.)		GT	WB	GL	Disp	
CT10037-9-4-M-4-8P-1-M	113	141	376	123	33	I	0.2	L	4	4.4
CT6196-33-11-1-3-M	120	143	348	99	28	I	0.6	L	5	4.0
CT9997-5-3-M-4-M	120	135	345	136	39	IB	0.4	L	3.6	3.8
CT10069-27-3-1-4	132	160	526	66	12	IA	2	L	3.4	5.2
CT10037-9-7-M-1-M	120	155	512	176	34	I	0.2	L	5	5.6
CT10037-30-3-M-1-2P-2-M	116	124	433	78	18	I	0.2	EL	5	3.8

[a]GT = gelatinization temperature, WB = white belly, GL = grain length, and Disp = dispersion.

Table 2. Yield ability, tiller number, and sterility percentage of the six breeding lines evaluated.[a] Naranjal Experimental Station, Risaralda, Colombia. 1994.

Line	Yield (t ha^{-1})	Tillers (no.)	Filled grain (%)
CT10037-9-4-M-4-8P-1-M	3.6 bc	82.53 bc	81.9 a
CT6196-33-11-1-3	3.3 c	85.00 ab	81.0 a
CT9997-5-3-M-4-M	3.2 c	84.01 abc	58.0 b
CT10069-27-3-1-4	4.3 ab	88.13 ab	87.5 a
CT10037-9-7-M-1-M	4.7 a	90.85 a	83.0 a
CT10037-30-3-M-1-2P-2-M	3.2 c	76.05 c	82.5 a

[a]Means in a column followed by the same letter are not significantly different (P = 0.05) by DMRT.

conditions at 700 masl. Rainfall during the cropping season ranged from 128 mm in March, the end of the growing season. to 394 mm in January.

CT10069-27-3-1-4 was selected in 1993 as one of the most promising lines, so agronomic evaluation was done. A simple unreplicated trial was conducted. Row planting produced a higher yield than spaced or hill planting, independent of the N level (0, 60 kg N ha^{-1}) and seed density (60, 80, 100 kg ha^{-1}). The rice responded to N at all densities, and the ideal seed density was 80 kg ha+ (data not shown).

The best six lines were evaluated again in 1994 in a yield trial in a randomized block design with three replications (Table 2). The yield potential of these lines was confirmed, with the highest yielding line (CT10037-9-7-M-1-M) averaging 4.7 t ha^{-1}, similar to that of CTl0069-27-3-1-4 and statistically different from the four others.

These preliminary results indicate that CIAT upland breeding lines are an alternative for the coffee-growing region of Colombia. Further research will aim to identify the best line for release and suitable agronomic practices. ■

MTU9993, a promising rainfed upland rice for Andhra Pradesh, India

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MTU9993 is a high-yielding variety identified from the progeny of Rasi/Fine Gora (white) for the rainfed uplands of coastal Andhra Pradesh. It was released in I993 to replace tall traditional varieties that are low yielding and prone to lodging. The short-duration (105-110 d) variety has straw-colored glumes and white kernels. MTU9993 is superior to the existing rainfed upland rice cultures, such as MTU17 and Mettasannavari, in grain quality and yield, shortness, tolerance for lodging, strong seed dormancy, tolerance for iron deficiency, and resistance to leaf blast.

The variety was tested from 1988 to 1992 and yielded 10-57% more than local checks (see table). ■

Performance of MTU9993 under rainfed upland conditions at multiple locations during dry seasons 1988-92.

Location and variety	Grain yield (t ha^{-1})				
	1988	1989	1990	1991	1992
Chinthapally					
MTU9993	3.2	3.5	-	-	-
MTU17 (check)	2.9	2.5	-	-	-
% increase	10.3	40.0	-	-	-
Lam, Guntur					
MTU9993	1.8	3.9	2.5	2.3	1.7
MS. Vari (check)	1.6	3.1	1.8	1.5	1.2
% increase	12.5	25.8	38.8	53.5	41.7
Ragolu					
MTU9993	4.4	3.4	-	2.7	2.8
MTU17 (check)	3.3	2.6	-	2.2	2.2
% increase	33.3	30.8	-	22.7	27.3
Jagtial					
MTU9993	0.9	2.6	2.2	-	-
Rasi (check)	0.8	2.2	2.0	-	-
% increase	12.5	18.2	10.0	-	-
V.R. Gudem					
MTU9993	2.3	2.2	1.8	1.4	-
MTU17 (check)	1.8	1.4	1.2	1.2	-
% increase	27.5	57.1	50.0	16.7	-
Maruteru					
MTU9993	4.3	2.5	2.2	2.8	-
MTU17 (check)	2.9	2.0	1.6	2.0	-
% increase	48.3	25.0	37.5	40.0	-