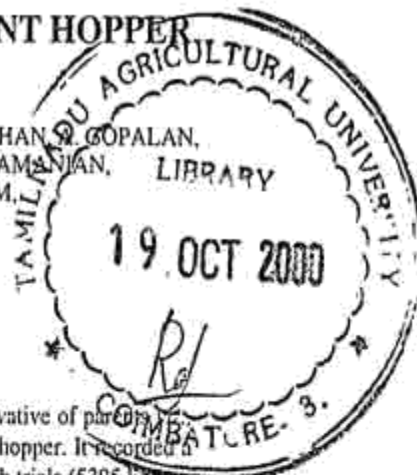


CO 46 : A MEDIUM DURATION BROWN PLANT HOPPER RESISTANT RICE VARIETY

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ABSTRACT

The newly released rice variety CO 46 during 1997 is a hybrid derivative of parent T7 / IR 20. It matures in 125 days with high level of resistance to brown planthopper. It recorded a mean yield of 6022 kg/ha as against IR 64 in station trials, and adaptive research trials (5395 kg/ha). It is medium to tall in stature with long panicle and medium size white grain. It is recommended for Periyar and Coimbatore districts as location specific and also BPH endemic areas of other districts in *Samba* season for Tamil Nadu State.

KEY WORDS : Brown planthopper, resistant variety, hybrid derivatives

INTRODUCTION

The brown planthopper, (BPH), *Nilaparvata lugens* (Stal.) has become a major rice pest since 1970s. The estimated loss in India is more than 20 million US \$. Indiscriminate use of insecticides in rice has led to resurgence of BPH. Hence, the BPH resistance research project was intensified from the year 1978 and the new rice variety CO 46 was released during 1997 as a BPH resistant variety in Tamil Nadu.

MATERIALS AND METHODS

With the objective of developing a BPH resistant rice variety for Periyar and Coimbatore districts during second season (Sep. - Jan.), the hybridisation work was initiated during 1978 with parents T7 / IR 20. Study on F₁ was made during 1979 and the segregating lines viz., F₂-F₅ were studied through pedigree selection during 1980-83. The progeny row trial was studied during 1984. The preliminary yield trial (PYT), comparative yield trial (CYT), multilocation trials (MLT) and adaptive research trials (ART) were made from the year 1985 - 1995. Based on the over all performance of the BPH resistant culture 831293 was released after the approval of the state varietal release committee during January 1997. The rice culture TNAU BPHR 831293 was released for cultivation in the western zone including Periyar and Coimbatore districts for *samba* season

and also for *samba* season in other BPH endemic districts.

RESULTS AND DISCUSSION

The BPH resistant culture TNAU BPHR 8312893 was the hybrid derivatives from the cross T7 / IR 20. At the Paddy Breeding Station, the TNAU BPHR 831293 recorded an average yield of 5926 Kg/ha with 8.8 per cent increased yield over IR 64 standard check in yield trials conducted from the year 1986 *rabi* to 1990 *kharif* seasons. In yield trials conducted at the Bhavanisagar research station during 1991-93, it recorded an average yield of 5706 kg/ha with increased yield of 48.6 per cent over IR 64. It matures in 125 days. In 68 ART conducted in Coimbatore and Periyar districts during 1993-94, it recorded an average yield of

Table 1. Over all performance of TNAU 831 293 in district trials

District	Year	Locations	Seed yield (Kg/ha)	
			Cul.831293	IR 64
On-farm trials				
Periyar	1993-94	21	6540	5639
Periyar	1994-95	39	7013	6470
Coimbatore	1993-94	8	5906	5098
Mean		68	6737	6052
Percentage over check			113.2	100.0
Station trials				
Coimbatore	1986-90	7	5926	5446
Bhavanisagar	1991-93	3	5706	3841
Over all Mean		78	6022	5395
% on check			111.6	100.0

Table 2. Reaction to insect pests over the years at Coimbatore under screen house (scores in grades)

Entry / Pest	1992		1993	1994	1995		1996	
	CBE	CBE	CBE	ADT	TIR	TRY	CBE	CBE
BPHR 831293								
BPH	1	1	1	-	-	-	1	1
WBPH	1	1	1	-	-	-	1	1
GLH	1	1	1	-	-	-	1	1
Gallmidge	3	3	-	-	-	-	1	1
Stemborer	5	3	5	-	-	-	-	-
Leafroller	3	5	3	-	-	-	5	-
IR 64								
BPH	3	3	3	3	-	-	3	3
WBPH	3	3	3	-	-	-	3	3
GLH	3	3	3	3	-	-	3	3
Gallmidge	3	-	3	3	-	3	-	-
Stemborer	3	5	-	1	-	3	3	3
Leafroller	3	3	3	-	7	3	5	-

BPH : Brown planthopper ; WBPH ; White backed planthopper; GLH : Green leafhopper

5737 kg/ha with 13.2 per cent more than the standard IR 64. In overall performance, out of 78 trials conducted, on an average, it yielded 6022 kg/ha, an increase of 11.6 per cent over the check IR 64 (Table 1).

Besides yield, this culture was tested over years for pests and diseases under artificial conditions. For BPH, and other hoppers, this culture scored one grade indicating its high resistance. For stemborer and gallmidge, it was either resistant or moderately resistant (Table 2).

For major diseases like blast, brown spot, sheath rot and sheath blight it showed moderate levels of resistances. (Table 3). This culture was

tested for various tests viz., milling, polishing, chemical analysis, cooking quality and palatability in comparison with IR 64. In all these tests, it was more or less equal to IR 64. (Table 4). The package of practices and description of this variety are as follows:

Package of practices for CO 46

Duration	: 125 - 130 days
Season	: Samba (Aug.) and Thaladi (sep.- Oct.)
Seed rate	: 60 kg/ha
Spacing	: 20 x 10 cm (50 hills/m ²)

Table 3. Reaction of TNAU BPHR 831293 to major diseases under artificial conditions

Culture / Disease	Grades of infection						Reaction
	1991	1992	1993	1994	1995	1996	
TNAU BPHR 831293							
Blast	3	3	5	3	5	5	MR
Brown spot	5	3	3	5	3	5	MR
Sheath rot	3	3	5	3	5	3	MR
Sheath blight	3	3	3	5	3	7	MS
RTV	0	0	0	3	0	7	MS
IR 64							
Blast	5	5	-	7	3	5	MR
Brown spot	5	3	-	3	5	5	MR
Sheath rot	5	3	-	7	5	7	MS
Sheath blight	3	3	-	5	3	9	S
RTV	3	1	-	3	3	3	R

Note : Grade scale followed for composite infection = 0-9

R = Resistant ; MR = Moderately resistant ;

MS = Moderately susceptible ; S = susceptible.

Table 4. Physical, Chemical, cooking and organoleptic testing of TNAU BPHR 831293

Characters	TNAU BPHR 831292	IR 64
Milling		
Endosperm yield (%)	66.69	68.00
Hulling (%)	31.67	30.00
Weevilled grain (%)	1.00	0.67
Polishing		
White rice yield (%)	92.20	87.00
Bran (%)	7.50	11.20
Head rice yield (%)	45.17	65.05
Chemical Analysis		
Amylose content (%)	23.20	24.00
Alkali disintegration value	2.30	7.00
Cooking quality		
Increase in weight (g)	35.00	32.00
Increase in volume (ml)	24.00	22.00
Actual time taken for cooking (mts)	25.00	30.00
Water absorption	41.00	43.00
TSS loss in the gruel	2.00	4.00
Palatability (Scores obtained out of 9)		
Colour	9.00	8.00
Appearance	9.00	8.00
Flavour	9.00	8.00
Texture	9.00	9.00
Taste	9.00	9.00

Source : 1. Professor and Head, Department of Food Science and Nutrition, Agricultural College and Research Institute, Madurai, 1995.

2. Professor and Head, Department of BioChemistry, Agricultural College and Research Institute, Coimbatore, 1995.

3. Professor and Head, Department of Agricultural Processing College of Agricultural Engineering, Coimbatore, 1996.

Manuring : Basal : 12.5 T FYM + 50:50:25 N:P:K Kg/ha.
Ist top dressing : 25 Kg N and 12.5 kg K (Panicle initiation) Zinc sulphate basal 25 kg/ha.
Use Azolla, Azospirillum or BGA.

Weedicide application : Thiobencarb : 2.5 l/ha or Fluchloralin : 1.0 l/ha or

Pendimethalin : 3.0 l/ha followed by one hand weeding on 32 to 35 days after transplanting.

Yield : 6022 kg/ha.

Description of variety CO 46.

Plant height : 120 cm

Duration : 125 - 130 days

Days to 50% flowering : 90 - 95

Leaf sheath : Green

Auricle : Colourless

Leaf blade : Green

Flag leaf : Erect to intermediate

Fertile glumes : Green at flowering and straw at harvest

Apiculus : Green

Awns : Present

Panicle : Long and heavy

Exsertion : Moderate to free

Rough rice (LXBXT in mm) : 9.2X2.3X1.9

Brown rice (LXBXT in mm) : 6.6X2.1X1.7

L/B ratio : 3.14

Grain type : Long slender

Abdominal white : Absent

1000 grain weight : 23.5 g.