

reason for the higher level of tolerance observed in *Azospirillum* cultures towards chromium.

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## CORH 2 - A NEW MEDIUM DURATION RICE HYBRID

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#### ABSTRACT

CORH 2 a medium duration rice hybrid was developed by three line breeding system using cytoplasmic genic male sterile line (CMS), maintainer line and restorer line (A/B/R) and tested as TNRH 16. The parentage of this hybrid is IR 58025A/C20R. This hybrid has a duration of 125 days, grows upto a height of 95 cm, with high tillering ability of 15 productive tillers per hill. The average grain number is 230 per panicle and 1000 grain weight is 24 g. The grain size is medium and rice is white in colour. It is suitable for July-October sowing in Tamil Nadu. It also comes up well in saline and alkaline soils. On an average it yields 6071 kg/ha which is 20.5 per cent increase over the check variety ADT 39.

**KEY WORDS:** Cytoplasmic Genic Male Sterile line, Rice, CORH 2, Hybrid

Rice in India occupies an area of 44 m.ha which represents 41% of the area cropped to cereals. Since rice is the major food grain of the total cereals consumed in India, any effort to achieve food security in the future must focus on this crop. The prospects for accelerating the growth in rice production by conventional means, as in the past is less encouraging as there is little scope for any expansion of the area under rice. The high yielding varieties that sustained the growth in rice production over the last 25 years have also tended to plateau. The additional production required to keep pace with the expected demand by the year 2006 is about 20 million tonnes, which represents a 25% increase over the current level of production. Development and use of hybrid rice is one of the approaches by which the productivity can be increased. This strategy follows the highly successful example of the Chinese, where the commercialisation of hybrid has increased total production of rice by 350 m.tonnes over the last 20

years, without any expansion in the area of 33 m.ha., Tamil Nadu Agrl. University, Coimbatore initiated research on hybrid rice during 1979. The first hybrid CORH 1 was released in the year 1994. Another hybrid of medium duration group was released as CORH 2 during January 1998 for commercial cultivation.

#### MATERIALS AND METHODS

The hybrid rice culture TNRH 16 was developed through three line breeding system (A/B/R) utilizing cytoplasmic genic male sterile line (IR58025A), maintainer line (IR58025B) and restorer line (C20R). This culture was tested in six Preliminary Yield Trials (PYT) conducted at Paddy Breeding Station, Coimbatore since 1994. The performance of this culture over locations was also studied by conducting Multi Location Trials (MLT) at six locations during *Rabi*, 1995 and *Rabi* 1996. During *Kharif* 1996 it was tested at nine hybrid rice research centres of India in the National

Table 1. Overall performance of TNRH 16

Sl. No.	Trials	No. of trials	Grain yield (Kg/ha)	
			TNRH 16	ADT 39
1.	Station trials	6	6713	5640
2.	MLT 1995 R	6	5221	4190
3.	MLT 1996 R	6	5030	4154
4.	LSD 1996 R	19	6247	5198
5.	ART 1996 K	47	7058	6004
6.	NHRT 1996 K	9	6155	-
	Mean	93	6071	5037

Percent increase over ADT 39 20.5

MLT - Multi Location Trial

LSD - Large Scale Demonstration

ART - Adaptive Research Trial

NHRT - National Hybrid Rice Trial

K - Kharif

R - Rabi

Hybrid Rice Trial (NHRT) and the performance was compared with the National check variety Jaya. Large scale demonstrations were conducted at 19 locations in 18 districts all over Tamil Nadu during *Rabi*, 1996 and the performance was compared with the check variety ADT 39. This culture was also tested in the farmers field by conducting Adaptive Research Trials (ART) at 47 locations in ten districts of Tamil Nadu during *Kharif* 1996.

## RESULTS AND DISCUSSION

The hybrid rice culture TNRH16 was tested for its yield potential during *Rabi* and *Kharif* seasons from 1994 to 1997 at Paddy Breeding Station, Coimbatore. In the station trials, TNRH16 had recorded an average grain yield of 6713 kg/ha (Table 1) which is 19.0 per cent increase over the check ADT 39. The highest grain yield of 7953 kg/ha was recorded during *Kharif* 1995. This hybrid was also tested in various research stations of Tamil Nadu under MLT during 1995 and 1996. The mean grain yield recorded by this hybrid was 5126 kg/ha which is 22.9 per cent increase over ADT 39. In the large scale demonstrations conducted at 19 locations in 18 districts, the hybrid recorded a mean grain yield of 6247 kg/ha which is 20.2 per cent

Table 2. Performance of TNRH 16 in NHRT

Centre	State	TNRH 16	Jaya
K 1996			
Coimbatore	Tamil Nadu	9210	7556
Hyderabad	Andra Pradesh	4527	4928
Maruteru	Andra Pradesh	4997	5750
Karnal	Haryana	7222	7685
Faizabad	Uttarpradesh	5942	5521
Karjat	Maharashtra	4497	5641
Mandya	Karnataka	8802	6681
Chinsurah	West Bengal	4041	5303
Pantnagar *	Uttarpradesh	3457	4158
Mean		6155	6133

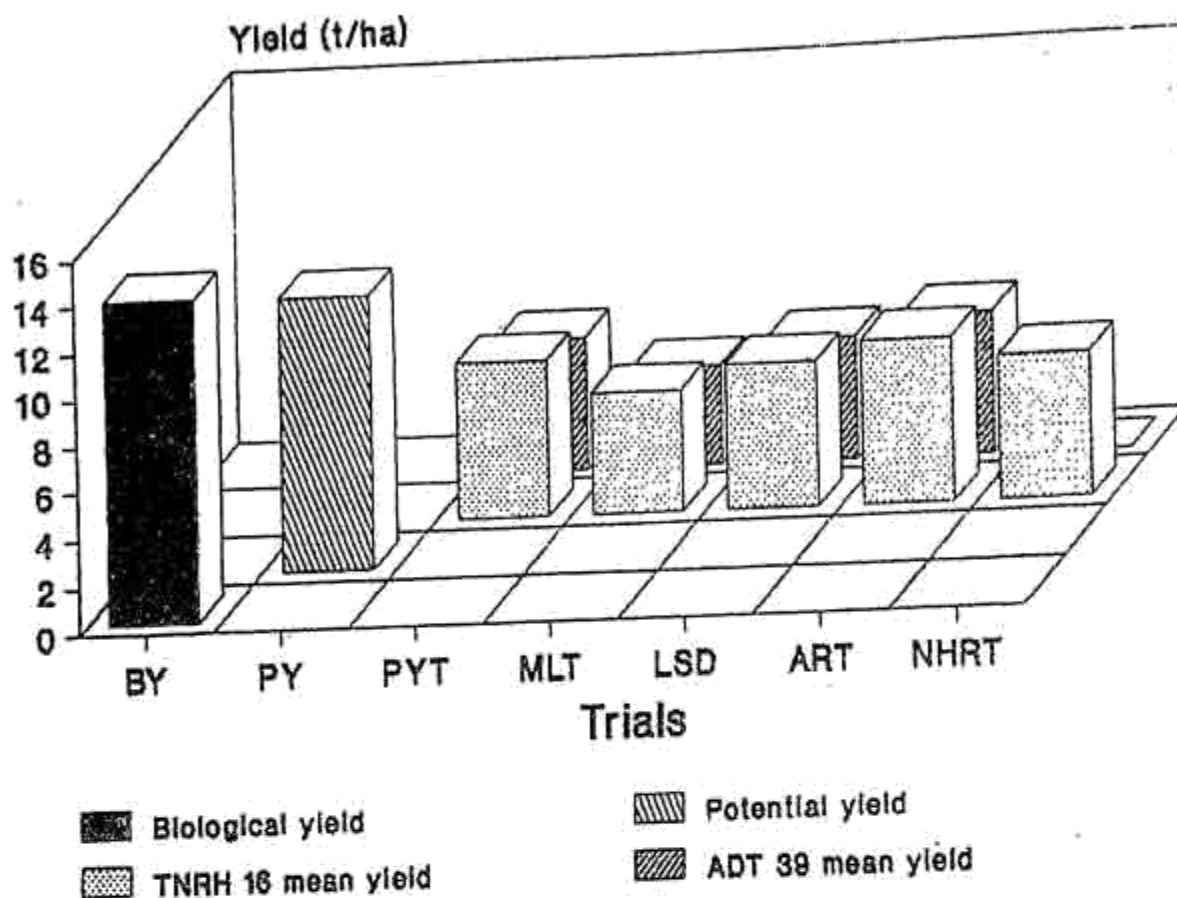
\* Not included in the Mean

increase over ADT39. Among the 19 large scale demonstrations, a maximum grain yield of 10200 kg was recorded at Thirupazhanam in Thanjavur district. The results of ART at 47 locations in 10 districts during *Rabi*, 1996 also showed its superiority over ADT 39. The mean grain yield recorded was 7058 kg/ha with an increase of 17.6 per cent over ADT39.

The results from NHRT (National Hybrid Rice Trial) during *Kharif* 1996 indicated that this hybrid gave 1.5 tonnes more yield than the national check

Table 3. Quality characteristics of TNRH 16 Rice hybrid

A. Physical characteristics		
i. Milling - Endosperm (%)	:	79.9
Husk (%)	:	20.1
ii. Polishing - White rice (%)	:	71.2
B. Cooking characteristics (5 g of sample)		
i. Cooking time (min)	:	13.14
ii. Volume expansion ratio	:	4.77
iii. Water absorption ratio	:	3.20
iv. Length elongation ratio	:	1.89
v. Breadth elongation ratio	:	1.67
C. Chemical Characteristics		
i. Moisture (%)	:	12.8
ii. Starch (%)	:	61.2
iii. Protein (%)	:	8.2



BY- Biological Yield  
 PY- Potential Yield  
 PYT- Preliminary Yield Trial  
 MLT- Multi Location Trial

LSD - Large Scale Demonstration  
 ART - Adaptive Research Trial  
 NHRT- National Hybrid Rice Trial

Fig 1. Performance of TNRH 16

variety Jaya in Tamil Nadu and Karnataka. The mean yield recorded was 6155 kg/ha (Table 2). This hybrid had recorded a grain yield of 5112 kg/ha which is 27.5 and 22.9 per cent increased yield over the saline tolerant varieties TRY1 and CO43 respectively when tested in the salt affected soils of Trichy district.

The overall performance of TNRH 16 under different trials is presented in Table 1. It recorded a mean grain yield of 6071 kg/ha when compared to 5037 kg/ha of the check variety ADT 39, which is 20.5 per cent increase over the check. The biological yield of this culture was 13.8 tonnes/ha (6.0 tonnes of

grain and 7.8 tonnes of straw). The estimated potential yield was 11.7 tonnes/ha (Fig. 1).

This hybrid is semidwarf (95 cm) in stature and matures in 125 days. It produces more number of productive tillers (upto 15 per hill) when planted with a spacing of 20x10 cm. The average grain number per panicle is 230 and 1000 grain weight is 24g. The grain is medium slender, straw coloured with white rice. Physical properties, cooking quality, chemical and organoleptic characters are good in all respects with a milling per cent of 79.9 and volume expansion ratio of 4.77 (Table 3). It is moderately susceptible to Tungro Virus, Blast and

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Table 4. Reaction to major diseases under field and controlled conditions

Sl.No.	Entries	Coimbatore K'95				Coimbatore K'96	
		Blast		Blast		RTV	Sheath blight
		NI	AI	NI	AI	AI	AI
1.	TNRH 16	5	5	5	5	7	7
2.	IR 58025A	7	7	5	7	7	7
3.	C 20R	NR	NR	0	3	7	9
4.	ADT 39	0	0	0	0	7	7
5.	IR 64	0	0	0	0	7	7

NI : Natural Infection

AI : Artificial Infection

NR : Not Recorded

Table 5. Reaction to major pests under controlled condition

Sl.No.	Entries	Coimbatore K'95			Coimbatore K'96		
		BPH	WBPH	GLH	BPH	WBPH	GLH
1.	TNRH 16	7	5	7	7	5	7
2.	IR 58025A	9	3	9	9	7	7
3.	C 20R	NR	NR	NR	7	3	
4.	ADT 39	NR	NR	NR	9	5	7
5.	IR 64	NR	NR	NR	3	5	3

BPH - Brown Plant Hopper

GLH - Green Leaf Hopper

WBPH - White Backed Plant Hopper

NR - Not Recorded

White Backed Plant Hopper under field and controlled conditions (Table 4 and 5). The culture TNRH 16 has been released as CORH 2 during January, 1998.

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