

## ADT(R) 46 : A high yielding medium duration rice variety for Tamil Nadu

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**Abstract:** Rice culture AD 94010, a derivative of the cross ADT 38/CO 45 was released as ADT(R) 46 in January 2002 for general cultivation in *Thaladi* / late *Samba* (September sowing) season of Tamil Nadu except Virudhunagar, Ramnad, Sivaganga, Chennai and The Nilgris. Its overall mean grain yield in 210 trials (1995-2000) was 6178 kg ha<sup>-1</sup> with 4.7, 8.2 and 7.0 per cent increased yield over the checks ADT 38, CO 43 and ASD 19 respectively. Its biological yield was 15.8 t ha<sup>-1</sup> (6.1 t of grain and 9.7 t of straw) and potential yield was 12.4 t ha<sup>-1</sup>. ADT(R) 46 is an erect, semi dwarf in stature with strong culm, non lodging habit and matures in 135 days. It has field resistance to stemborer and leaf folder. The rice is long slender, white with high milling (72%), head rice recovery (61.5%), crude protein (9.08%), amylose (30%) and soft gel consistency, with good linear elongation ratio (1.76 times) after cooking. It has acceptable organoleptic preferences. ADT(R) 46 is an alternate variety for ADT 38.

**Keywords :** Rice, ADT(R) 46, medium duration variety, long slender rice.

### Introduction

In Tamil Nadu, 72 lakh tonnes rice is produced from 21 lakh ha. Generally five lakh ha of area in Cauvery Delta Zone is under *Thaladi* cultivation. Out of 28 medium duration rice varieties grown in different parts of Tamil Nadu, the popular ones released from Tamil Nadu Rice Research Institute are Improved White Ponni, ADT 38 and ADT 39. These were released for general cultivation more than a decade ago. Hence, an attempt was made to develop an alternate variety in this duration group with superior qualities than ADT 38.

### Materials and methods

Hybridization was effected between ADT 38 and CO 45 at Tamil Nadu Rice Research Institute, Aduthurai during *Thaladi* 1990 and the homozygous line No. 98 18-2 was fixed as AD 94010 in F<sub>4</sub> generation during *Thaladi* 1994 (Fig. 1). The culture AD 94010 was

evaluated for its performance from 1995 to 2000 in station trials, manurial trial, Multilocation trials (MLT), Adaptive Research trials (ART) and in National trial (AICRIP).

### Results and discussion

At Tamil Nadu Rice Research Institute, Aduthurai, AD 94010 recorded a mean grain yield of 6656 kg ha<sup>-1</sup> in 132 days with 26.7 and 32.7 per cent increase over the checks ADT 38 and CO 43 respectively when tested in *Thaladi* season (September sowing) during 1995 -2000.

During *Thaladi* 2000, AD 94010 was compared under different levels of NPK at Tamil Nadu Rice Research Institute, Aduthurai. It recorded significantly higher grain yield of 5203 kg ha<sup>-1</sup> and straw yield of 8358 kg ha<sup>-1</sup> at the manurial level of 150:60:60 kg ha<sup>-1</sup> (Table 1).

**Table 1.** Performance of ADT(R) 46 in manurial trial (Thaladi 2000) at Tamil Nadu Rice Research Institute, Aduthurai

Trt.No.	Levels of NPK (kg ha <sup>-1</sup> )	Grain yield (kg ha <sup>-1</sup> )	Straw yield (kg ha <sup>-1</sup> )
T1	0:60:60	3030	5687
T2	0:60:90	3310	6692
T3	100:60:60	4667	7410
T4	150:60:60	5203	8358
T5	200:60:60	4610	6576
T6	100:60:90	4513	7117
T7	150:60:90	4700	7522
T8	200:60:90	4353	7582
T9	132.7:57.4:34.3*	4487	7732
	CD	0.593	0.62

\* STCR based fertilizer recommendation

**Table 2.** Mean performance of ADT(R) 46 (AD 94010) in different trials

Name of the trial	Grain yield (kg ha <sup>-1</sup> )					
	ADT(R) 46	ADT 38	CO 43	ASD 19	Jaya	Suraksha
Station cum On-station demonstration (1995-2000)	6656 (8)	5254 (8)	5016 (7)	-	-	-
Multilocation trial 1998 - 2000	5496 (29)	5025 (29)	4862 (29)	4820 (29)	-	-
Adaptive Research trial 1999 and 2000	6270 (173)	6079 (173)	6107 (74)	6052 (99)	-	-
Manurial Trial 2000*	5203 (1)	-	-	-	-	-
National Trial Kharif 1998*	5446 (1)	-	-	-	3927	4800
No. of trials	210	210	110	128	-	-
Overall mean	6178	5902	5710	5773	-	-
% increase over checks		4.7	8.2	7.0	-	-

\* Not included in the overall mean

Figures in parenthesis indicate number of trials

In multilocation trials conducted during three years from 1998-1999 to 2000-2001 in different research stations, it registered an overall mean grain yield of 5496 kg ha<sup>-1</sup> in 135 days (29 locations) with 9.4, 13.0 and 14.0 per cent increased yield respectively over ADT 38 (5025 kg ha<sup>-1</sup>), CO 43 (4862 kg ha<sup>-1</sup>) and ASD 19 (4820 kg ha<sup>-1</sup>).

Table 3. Morphological characters of ADT(R) 46

Characters	Remarks
Habit	: Erect, semi-dwarf with strong culm
Anthocyanin pigment	: Absent throughout the plant parts
Leaf sheath	: Green
Auricle	: Pale green
Junction	: Cream
Ligule	: Long and white
Septum	: Cream
Leaf blade	: Dark green with intermediate pubescence
Flag leaf angle	: Erect and acute
Apiculus	: Green
Fertile glumes	: Green at the time of anthesis and straw at maturity
Awns	: Short terminal awns occasionally present
Panicle	: Intermediate type and well exerted Length : 26.3 cm (23-28 cm)

ADT (R) 46 recorded an overall mean grain yield of 6270 kg ha<sup>-1</sup> with 3.1, 2.7 and 3.6 per cent increase respectively over the checks ADT 38 (6079 kg ha<sup>-1</sup>), CO 43 (6107 kg ha<sup>-1</sup>) and ASD 19 (6052 kg ha<sup>-1</sup>).

ADT(R) 46 was evaluated as-IET 16070 in Initial Varietal Trial - Irrigated Medium Zone I at National level. In seven locations, it registered 5446 kg ha<sup>-1</sup> of mean grain yield with 38.7 and 13.5 per cent increase over Jaya (3927 kg ha<sup>-1</sup>) and Suraksha (4800 kg ha<sup>-1</sup>).

The mean performance of ADT(R) 46 in different trials (210 trials) was 6178 kg ha<sup>-1</sup> which was 4.7, 8.2 and 7.0 per cent higher than ADT 38, CO 43 and ASD 19 respectively (Table 2). The total biomass production of ADT(R) 46 was 15.8 t ha<sup>-1</sup> (6.1 t of grain and 9.7 t of straw). Its potential yield was 12.4 t ha<sup>-1</sup> as recorded at Attur of Salem district.

The variety has field resistance to stem borer and leaf folder and moderate susceptibility to thrips, BPH and gall midge. It is moderately susceptible to brown spot and RTD under field conditions. Under artificial condition, this variety is susceptible to sheath rot, sheath blight, BLB, RTD, GLH, BPH and WBPH.

ADT(R) 46 is semi dwarf and erect (93.8 cm) in stature with strong culm and matures in 135 days (132-140 days). The morphological characters of the variety is given in Table 5. It has a 1000 grain weight of 23.8 g and the rice is long slender (L/B ratio -3.12), white and translucent. The variety has high milling (72.0% - raw rice; 76.0% -parboiled), head rice recovery (61.5% - raw rice, 62.9% - parboiled) and crude protein (9.08%) than the check ADT 38 which recorded 67.1% and 72.0% for milling, 51.0% and 59.7% for head rice recovery and 8.75% for crude protein. The variety has amylose content of 30.0% with soft gel consistency. Upon cooking, weight increase (28.5 g) and volume increase (32.0 ml) was found to be higher than ADT 38 which recorded 27.0 g and 30.0 ml respectively. ADT(R) 46 took less time for cooking (25 min) than ADT 38 (27 min). The elongation ratio of raw rice is 1.76 times while for ADT 38 it is 1.62 times. It has acceptable organoleptic characters.

Considering the above highlights, the variety ADT(R) 46(AD 94010) was released during January 2002 as an alternate variety to ADT 38 and it can be cultivated as a transplanted crop in *Thaladi* /late *Samba* seasons of Tamil Nadu where ADT 38 is grown.  
(Received : May 2004; Revised : August 2005)