

**ADT 43- A high yielding short duration rice variety for Tamil Nadu**

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**Abstract:** Rice culture AD 93013, a derivative of IR 50 / Improved White Ponni was released as ADT 43 during January 1998 for general cultivation in Tamil Nadu. It recorded a mean yield of 5933 kg ha<sup>-1</sup> in 110 days with 6.0, 6.2 and 6.5% higher yield than those of IR 50, ADT 36 and ASD 18 respectively. The biological yield of ADT 43 was 14.5 t ha<sup>-1</sup> (5.9 t of grain and 8.6 t of straw) and its potential grain yield was 10.0 t ha<sup>-1</sup>. It is semi dwarf in stature with medium slender white rice finer than improved White Ponni. ADT 43 is resistant to Green leaf hopper and field tolerant to stem borer and Gallmidge. The rice possess high amylose content (> 25%) with good linear elongation (1.72 times) and high volume expansion ratio (4.6) after cooking. It is suitable for growing in the first crop season (Sornavari/Kar/Kuruvai) of Tamil Nadu except Kanyakumari and Tuticorin districts. (*Key words: Rice, Early duration, High yielding, High quality, Medium slender rice.*)

IR 50 is a short duration (105 days) high yielding long slender white rice variety with good tillering and good cooking quality. But it is highly susceptible to blast and brown plant hopper and as such not suitable for Thaladi season (September – October sowing).

Improved White Ponni is a medium duration (135 days) high yielding, medium slender White rice variety with long drooping panicle, with high grain number per panicle. The White Ponni rice fetches high price in the market. Hence, a better variety is essential with all the good features of IR 50 (Plant type, duration, high yielding, good tillering ability) and improved White Ponni (Grain type, panicle length, grain number per panicle and good cooking quality) and suitable for growing in Sornavari/Kar/Kuruvai (April – June) and Navarai (December – January) seasons.

### Materials and Methods

Hybridisation was carried out between IR 50 and improved White Ponni at Tamil Nadu Rice Research Institute, Aduthurai during Kuruvai, 1992 and the culture AD 93013 was fixed in its F<sub>3</sub> generation during late Thaladi 1993-94 (Fig 1). AD 93013 was evaluated for its performance from 1994 to 1997 in the station yield trials, manurial trials, multilocation trials (MLT), Adaptive Research Trials (ART) and in Large Scale Demonstrations (LSD).

### Results and Discussion

At the Tamil Nadu Rice Research Institute, Aduthurai AD 93013 recorded a mean grain yield

of 5592 kg ha<sup>-1</sup> in 111 days with 27.2 and 4.9% increase over IR 50 and ADT 36 respectively when tested during Kuruvai season (June – September) 1994–97 (Table 1).

AD 93013 was compared under different levels of NPK along with ASD 18 during Kuruvai 1996. The results indicated that it surpassed ASD 18 in 12 treatments out of 14 treatments and 125:50:50 kg NPK ha<sup>-1</sup> was found to be the optimum dose. At this level it recorded the highest grain yield of 6950 kg ha<sup>-1</sup>, 7.8% increase over ASD 18 (Table 2).

During 1996 and 1997, AD 93013 was tested in MLT in different research stations where it registered a mean grain yield of 5558 kg ha<sup>-1</sup> in 118 days with an increased grain yield of 15.2% over IR 50 (4823 kg ha<sup>-1</sup>).

Out of 105 Adaptive Research Trials conducted during 1996–97 in 21 districts of Tamil Nadu, results were obtained from 99 locations in 20 districts. The culture AD 93013 had recorded a mean grain yield of 5920 kg ha<sup>-1</sup> with 4.2, 6.2 and 7.9% increase over IR 50, ADT 36 and ASD 18 respectively (Table 1). It yielded more than 6000 kg ha<sup>-1</sup> at 44 locations and out yielded all the three checks in 13 districts viz. Nagapattinam, Thanjavur, Cuddalore, Tiruvannamalai, Vellore, Tirunelveli, Pudukkottai, Trichy, Dindigul, Kanjeeppuram, Salem, Erode and Sivagangai.

In large scale demonstrations (LSD) conducted at Tamil Nadu Rice Research Institute, Aduthurai, State Seed Farm, Sakkaranmangalam (Nagapattinam)

**Table 1.** Mean performance of ADT 43 (AD 93013) in different trials (1994 to 1997)

Name of trial	Grain yield (kg ha <sup>-1</sup> )			
	ADT 43	IR 50	ADT 36	ASD 18
Tamil Nadu Rice Research Institute, Aduthurai (1994-1997)	5592(5)	4440(3) 27.2	5425(4) 4.9	—
% over check				
Manurial Trial (1996)	6950(1)	—	—	6450(1)
% over check				7.8
Multilocation Trials (1995-1997)	5558(16)	4823(16)	—	5692(16)
% over check		15.2		
Adaptive Research Trials (1996-1997)	5920(99)	5680(99)	5572(99)	5485(99)
% over check		4.2	6.2	7.9
Large Scale Demonstration (1996-1997)	6465(15)			
Overall Mean	5933	5532	5566	5522
No. of trials	136	118	103	113
Corresponding Mean yield of ADT 43	—	5864	5911	5879
% Increase over checks	—	6.0	6.2	6.5

Figures in parenthesis indicate No. of trials

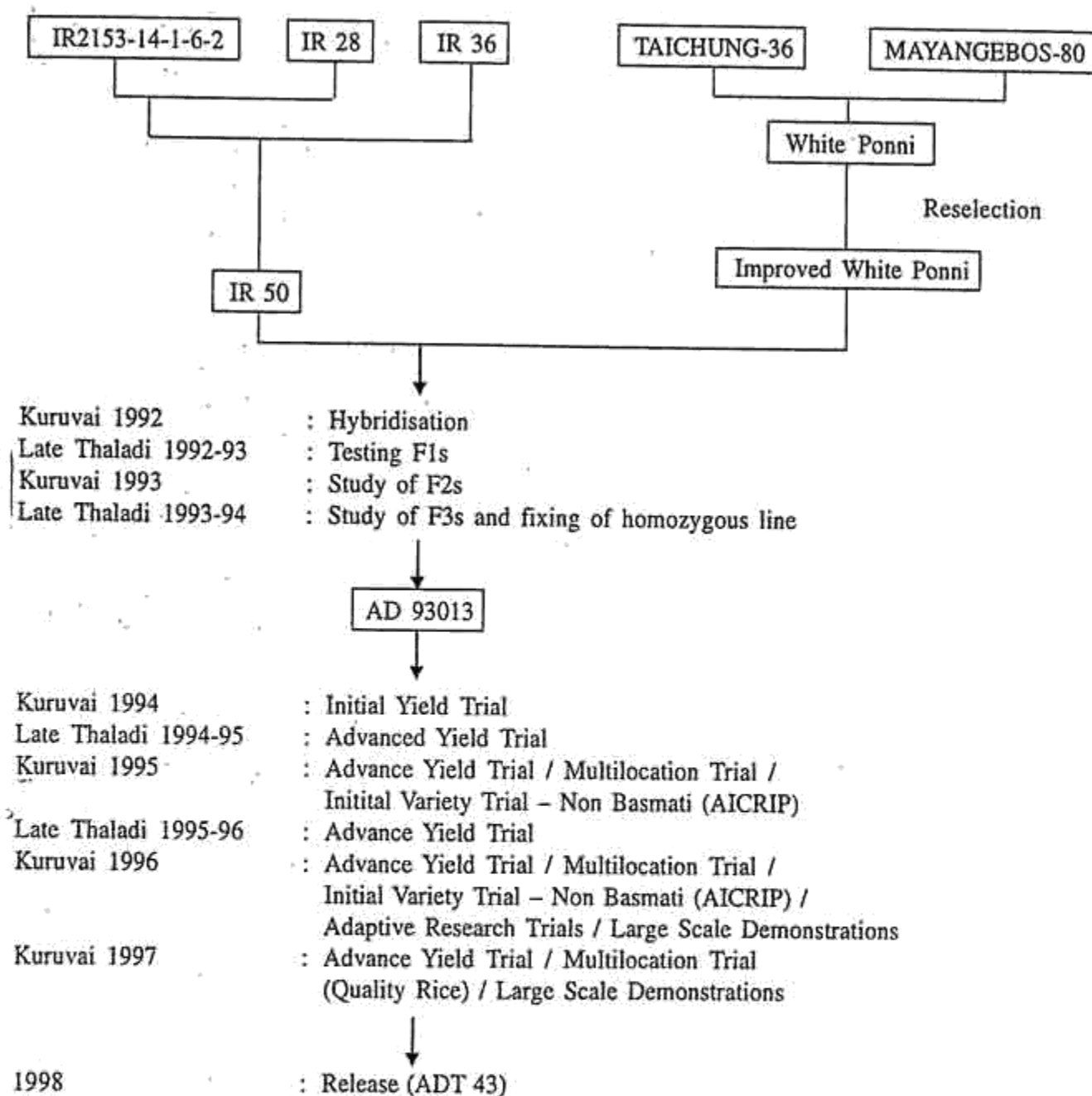
**Table 2.** Varietal cum manurial trial Kuruvai, 1996, Tamil Nadu Rice Research Institute, Aduthurai.

Treatment No.	Level of NPK kg ha <sup>-1</sup>	Grain yield kg ha <sup>-1</sup>	
		ADT 43	ASD 18
01	0:50:50	3720	3450
02	50:50:50	4180	3550
03	100:50:50	5670	5200
04	150:50:50	5750	5500
05	200:50:50	5770	5800
06	125: 0:50	5430	5030
07	125:25:50	6200	5380
08	125:50:50	6950	6450
09	125:75:50	5720	6180
10	125:50:0	5700	5070
11	125:50:25	5970	4880
12	125:50:75	6030	5580
13	STL Recommended*	5180	4900
14	0:0:0	3500	3130
	CD (P=0.05)	0.68	0.75

\* 117.5 : 14 : 2kg NPK/ha for ADT 43

\* 117.5 : 21 : 6kg NPK/ha for ASD 18

Fig 1: Pedigree of AD 93013



and at 13 farmers holdings, it yielded an average of 6465 kg ha<sup>-1</sup> (Table 1).

The biological yield of AD 93013 was 14.5 t ha<sup>-1</sup> (5.9 t of grain and 8.6 t of straw) and its potential yield was 10.0 t ha<sup>-1</sup>. Its mean performance in the different trials was 5933 kg ha<sup>-1</sup> which was 6.0, 6.2 and 6.5% higher than that of IR 50, ADT 36 and ASD 18 respectively.

It is resistant to GLH and field tolerant to stem borer and gall midge. It possesses high

tillering ability just like IR 50 and medium slender white rice finer than improved White Ponni, in addition to higher productivity and early duration. Its rice possesses high amylose (>25%), good cooking quality, good linear elongation of 1.72 times and high volume expansion ratio of 4.6 after cooking.

Based on its better performance, early duration coupled with quality rice, AD 93013 was released as ADT 43 during January 1998.

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