

ADT 38. A MEDIUM DURATION RICE FOR SECOND SEASON IN TAMIL NADU

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ABSTRACT

An attempt to evolve a high yielding medium duration rice variety for second season in Tamil Nadu has resulted in the isolation of a promising culture AD 85004. It outyielded both IR 20 and CO 43 with multiple resistance to major pests and diseases. It is a semi-tall type with a duration of 130-135 days. The rice is white with medium slender fine quality. Hence, it is released as ADT 38 for Samba/thaladi season in Tamil Nadu to replace IR 20 and CO 43.

KEY WORDS: Rice, Medium duration, Semitall rice.

Out of 26 lakh hectares of rice in Tamil Nadu, the samba/thaladi crops occupy about 70 per cent of the area. At present only a few high yielding varieties such as Ponmani, a long duration variety, IR 20, Co. 43, Co 44 and Ponni, medium duration varieties are being grown in this season. Eventhough these varieties are popular and grown extensively, they lack stable performance in productivity. In spite of productive ability of these varieties, farmers could not realise more than five tonnes per hectare due to constrains like low temperature, low light, high humidity and due to incidences of many pests and diseases particularly leaf folder, blast

and rice tungro virus. Hence, with a view to evolve a higher yielding variety than the current ruling cultivars with high level of field tolerance to various physical and biological stresses prevalent in second season, a project was undertaken at Tamil Nadu Rice Research Institute, Aduthurai.

MATERIALS AND METHODS

The advanced breeding materials generated at Tamil Nadu Rice Research Institute, Aduthurai and the test materials received under International Rice Testing Programme (IRTP), International Rice Research Institute, Philippines and National Testing Programmes were involved in the evaluation

trials every year. In the course of testing, a culture IR 21820-154-3-2-2-3 in the International Rice Yield nursery (medium) was identified as a potential high yielding culture. This culture had a parentage of IR 1529-680-3-2/IR 4432-52-6-4//IR 7963-30-2. This was locally designated as AD 85004 and tested during thaladi season of 1983 and 1984 with the same agronomic and management practices followed for medium duration varieties. This culture was tested in several yield trials during 1985 with the checks IR 20 and Co 43. In 1986 it was tested simultaneously under multilocation trials in different rice research stations of Tamil Nadu and Adaptive research trials in farmers' holdings in samba/thaladi season. The biometrical observations on plant height, number of productive tillers per hill, panicles per m², number of grains per panicle and weight of 1000 grains were recorded.

RESULTS AND DISCUSSION

The results of yield trials conducted during four years from 1983-84 to 1986-87 at Tamil Nadu Rice Res. Institute, Aduthurai are furnished in Table 1. The improved rice culture AD 85004 recorded consistently

higher grain yield over the checks IR 20 and Co 43. The mean grain yield of AD 85004 was 5.9 t/ha with 44 and 21 per cent increase over IR 20 and Co 43 respectively.

In the multilocation trials conducted during 1986-87 at different rice research stations in Tamil Nadu, the culture AD 85004 registered a mean grain yield of 5.1 t/ha (Table 2).

Based on the consistent performance in research stations, the culture AD 85004 was tested in Adaptive Research trials during 1986-87 at 37 farmers' holdings in eight districts. It registered a mean grain yield of 6.2 t/ha with 14 and 19 per cent increase over IR 20 and Co 43 respectively (Table 3).

In All India Co-ordinated Rice Improvement Project trials conducted at ten locations throughout India in 1986, the culture AD 85004 (IET 10435) ranked second with a mean grain yield of 5.3 t/ha. In International Rice Testing Programme 1984, this culture (IR 21820-154-3-2-2-3) recorded a mean grain yield of 5.8 and 3.8 t/ha in South East Asia and South Asia respectively as against 5.1 and 3.2 t/ha recorded by

Table 1. Performance of AD 85004 (ADT 38) at Tamil Nadu Rice Research Institute, Aduthurai.

S.No.	Culture	Grain yield (Kg/ha)				Mean
		1983-84	1984-85	1985-86*	1986-87**	
1.	AD 85004	7222	5263	6029	5013	5882
2.	Co 43	5741	4426	6047	4207	4855
3.	IR 20	4225	4225	4567	3294	4085
	% on Co 43	126	119	119	119	121
	% on IR 20	171	124	132	152	144
	CD (P = 0.05)	2352	600	-	-	-

* Mean of seven trials.

** Mean of four trials.

Table 2. Performance of AD 85004 (ADT 38) in Multilocation Trials.

S.No.	Research station	Grain yield (Kg/ha)		
		AD 85004	Co 43	IR 20
1.	Aduthurai	5284	4773	4040
2.	Coimbatore	5093	5956	5787
3.	Pondicherry	5417	5615	5198
4.	Madurai	5335	6156	4853
5.	Ambasamudram	2797	1868	2647
6.	Tirur	4352	3024	3722
7.	Trichy	7407	6471	6584
	Mean	5098	4842	4690
	% on Co 43	105.3	-	-
	% on IR 20	108.7	-	-

Table 3. Performance of AD 85004 (ADT 38) in Adaptive Research Trials.

S.No.	District.	Mean Grain Yield (Kg/ha)		
		AD 85004	Co 43	IR 20
1.	Thanjavur (18)	5809	5174	5153
2.	Tiruchirapalli (4)	6330	6162	5492
3.	Pudukottai (3)	5955	4633	4694
4.	South Arcot (2)	6178	-	5424
5.	Madurai (3)	8113	7801	7423
6.	Periyar (4)	6709	5879	5755
7.	Dharmapuri (1)	10750	-	9300
8.	Kanyakumari (2)	4582	3366	4221
	Grand Mean (37)	6249	5254	5483
	% on IR 20	114	-	-
	% on Co 43	119	-	-

Figures in parenthesis denote number of locations tested.

the international check IR 42.

Such a high yield to the tune of six tonnes per hectare was recorded by the culture AD 85004 due to increase in the three major yield components of rice viz., number of panicles

per unit area, number of filled grains per panicle and grain weight as evidenced from the data on yield components (Table 4). The number of panicles per square metre for the culture AD 85004 was as high as 401 as against 328 and 347 recorded

Table 4. Important yield components in AD 85004 (ADT 38).

Variety	Duration (days)	Height (cm)	Productive tillers hill	Panicles/ m ²	Grains/ panicle	1000 grain weight (g)
AD 85004	131	83.4	8.4	401	89	21.6
CO 43	133	80.1	6.9	347	104	20.1
IR 20	132	80.5	6.8	328	86	19.4

Table 5. Reaction of AD 85004 (ADT 38) to insect pests and diseases under controlled screening

Varieties	Score								
	Blast	BLB	RTV	Brown spot	BPH	WBPH	GLH	Leaf folder	Gall midge
AD 85004	0	7	5	2	5	1	3	5	5
IR 20	3	5	9	2	7	9	9	9	9

by IR 20 and Co 43 respectively. This increase in panicle number is due to profuse tillering habit leading to enhancing the sink capacity of the culture AD 85004. Similarly, number of

grains per panicle and grain weight are also higher than IR 20 substantiating the reasons for high productivity of the new culture. Eventhough the number of grains per panicle

is more in Co 43 than AD 85004, the increase in number of productive tillers and 1000 grain weight in AD 85004 were responsible for the increase in yield over Co 43.

This culture was screened under artificial conditions for the important pests and diseases (Table 5). It possesses resistance to blast, brown spot, GLH and WBPH. It is also moderately resistant to RTV, BPH, leaf folder and gall-midge.

The morphological characters of ADT 38 are: Plant height semi-tall, 80-85 cm, nonlodging, days to 50% flowering 100-105, days to maturity 130-135, anthocyanin pigment absent, leaf sheath pulvinus and leaf axil green, leaf blade dark green, normal, ligule white, auricle white, non prominent, septum white, flag leaf acute, erect, exertion full, panicle long, moderately dense, fertile glumes

green at flowering, golden yellow colour at maturity, apiculus green, awns absent, 1000 grain weight 21 g., weight of one litre of paddy 550 g., hulling 78.2%, milling 68.0%, dormancy 25 days, sieve size 1/4" x 3/4", kernal characters: L x B x T 6.9 x 2.4 x 2.0 mm, L/B ration 2.9, rice size medium slender, grade fine, colour white, abdominal white absent, translucent, amylose content 24.2%, gel consistency 78 mm and cooking quality good. This culture is quite suitable for growing during **samba/thaladi** seasons of various districts in Tamil Nadu.

Based on the above desirable features, the culture AD 85004 was approved by the State Varietal Release committee of Tamil Nadu during May 1987 and released as an improved variety, ADT 38, by the Tamil Nadu Agricultural University, Coimbatore for large scale cultivation.