

ASD 19 (AS 781/1) - NEW MEDIUM DURATION HIGH YIELDING RICE VARIETY FOR SOUTHERN DISTRICTS OF TAMIL NADU.

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ABSTRACT

A new rice variety ASD 19 (AS 781/1) has been developed from the Rice Research Station, Tamil Nadu Agricultural University, Ambasamudram, for southern districts of Tamil Nadu. ASD19 recorded a mean yield of 5.8t/ha in 127 days (240 trials). It outyielded IR 20 by 14.2 per cent, ADT 39 by 8.4 per cent, CO43 by 11.9 per cent and Ponni by 13.2 per cent. The biological yield of ASD 19 is 16.5 t/ha (5.8 t of grain; 10.7 t/ha of straw) and its potential grain yield is 11.0 t/ha. It is semidwarf in stature with well exerted panicles. Grain is short slender white rice with 9.59 percent protein content. ASD 19 is moderately resistant to blast and moderately tolerant to early drought. ASD 19 is suitable for October sowings in *Pishanam* of Southern districts in place of IR 20 and ADT 39.

KEY WORDS : Rice Medium Duration, *Pishanam*, Soil N, Short Slender Rice.

Genetic improvement of modern varieties and development of related cultivation practices were the driving force behind the impressive growth in rice-production over the last 30 years. Plant breeders have incorporated many yield stabilising traits into modern rices. Among the several rice varieties released in Tamil Nadu, IR 20, ADT 39, CO 45 and Ponni are promising ones in second crop season (September - October). IR 20 and ADT 39 occupy major area of Tamil Nadu during *Pishanam* season (October sowing). Evolution of a high yielding medium maturing rice variety with better cooking quality than IR 20 and ADT 39, not only increases the yield per unit area but also the total production in that season in southern districts of Tamil Nadu.

MATERIALS AND METHODS

ASD 19 is a cross derivative of Lalnakanda/ IR 30. The culture AS781/1 was fixed during *Pishanam* 1978 in its F₃ generation at the Rice Research Station, Tamil Nadu Agricultural University, Ambasamudram and evaluated for its performance since 1979-80 onwards. The culture AS 781/1 was also tested in multilocation trials, (MLT) adaptive research trials (ART) minikit trials (MKT) National trials (AICRIP) and International trials.

RESULTS AND DISCUSSION

At the Rice Research Station, Ambasamudram, ASD 19 recorded a mean grain yield of 5.2 t/ha

(1979 to 1993) in 127 days, registering an increase of 37.8 percent over IR 20. Its corresponding increase in grain yield over ADT 39, CO 43, Ponni/White ponni and CO45 was 41.9, 23.9, 13.2 and 10.9 per cent respectively (Table 1). During *Pishanam* 1987-88, it was tested as a direct-seeded crop where it yielded 3.8 t/ha in 127 days, compared to 3.3, 2.6, 3.4 and 3.0 t/ha by IR 20, Ponni, CO 43 and ADT 38 respectively.

ASD 19 was tested under different levels of nitrogen for three years (1991-92 to 1993-94) along with ADT 39. ASD 19 yielded more than ADT 39 at all levels; it was an efficient user of soil N and 100 kg N/ha was the optimum dose where it yielded 4.5 t/ha, with 16.5 percent more than ADT 39 (Table 2)

During 1986-87, ASD 19 was tested in MLT in different research stations where it registered a grain yield of 5.1 t/ha (mean for six centres) with 7.2, 6.1 and 0.6 per cent increase over IR 20, CO 43 and CO 45 respectively. ASD 19 was also tested at five other research centres over the seasons (1981-82 to 1992-93) in 19 trials. The corresponding mean grain yield of ASD 19 against the checks IR. 20, ADT 39, CO 43 and CO 45 ranged from 4.5 to 6.1 t/ha, an increase of 2.7 to 34.2 per cent over the checks (Table 1)

In the ART conducted for four years (1987-88 1990-91) in Tirunelveli Kattabomman and Chidambaranar districts and one year (1983-84) in

Table 1. Performance of ASD 19 in different trials

Name of trial	Year	Mean grain yield (t/ha)						
		ASD 19	IR 20	ADT 39	CO 43	CO 45	Ponni/ W.Ponni	Jaya
Rice Research Station, Ambasamudram								
Overall mean	1979-1993	5.2 (18)	3.8 (18)	3.8 (5)	4.3 (13)	4.8 (3)	4.4 (14)	-
Corresponding mean yield of ASD 19		-	5.2	5.4	5.3	5.3	5.0	-
% increase over checks		-	37.8	41.9	23.9	10.9	13.2	-
Multilocation trials	1986-1987	5.1 (6)	4.8 (6)	-	4.8 (6)	5.1 (6)	-	-
% increase over checks		-	7.2	-	6.1	0.6	-	-
Other station trials								
Overall mean	1981-1992	4.9 (19)	4.0 (12)	4.0 (1)	5.6 (9)	4.4 (3)	-	-
Corresponding mean yield of ASD 19		-	4.6	5.4	6.1	4.5	-	-
% increase over checks		-	14.6	34.2	8.2	2.7	-	-
Adaptive Research Trials								
Nellai Kattabomman	1987-88 to 1990-91	5.6 (49)	5.1 (48)	6.8 (10)	5.0 (49)	6.7 (10)	-	-
Chudambaranar	1987-88 to 1990-91	6.9 (28)	6.0 (28)	5.7 (10)	6.3 (28)	6.6 (10)	-	-
Kanyakumari	1983-1984	4.1 (14)	-	-	3.6 (14)	-	-	-
Overall mean grain yield		5.7 (91)	5.4 (76)	6.2 (20)	5.2 (91)	6.7 (20)	-	-
Corresponding mean grain yield of ASD19		-	6.0	6.4	5.7	6.4	-	-
% increase over checks		-	10.8	2.5	11.2	(-)4.5	-	-
Overall mean straw yield		10.7 (91)	10.1 (75)	10.8 (20)	10.0 (90)	12.7 (20)	-	-
Corresponding mean straw yield of ASD19		-	11.2	13.1	10.7	13.1	-	-
% increase over checks		-	10.9	21.3	7.0	3.1	-	-
Minikits (V.O.C. Dist.)								
	1988-89 (50)	6.4 (5.9-7.3)	-	-	-	-	-	-
	1992-93 (50)	6.3 (3.8-7.2)	-	-	-	-	-	-
Overall mean		6.3 (100)	-	-	-	-	-	-
National Trials								
	1987	4.1 (6)	-	-	-	-	-	39 (6)
	1990	4.7 (2)	-	-	-	-	-	3.6 (2)
Overall mean		4.3 (8)	-	-	-	-	-	3.7 (8)
% increase over checks		-	-	-	-	-	-	13.8
Overall mean grain yield		5.8	5.0	5.7	5.1	6.0	4.4	3.7
No. of trials		240	112	26	119	32	14	8
Corresponding mean yield of ASD19		-	5.7	6.1	5.7	5.9	5.0	4.3
% increase over checks		-	14.2	8.4	11.9	(-)2.0	13.2	13.8
Mean duration (days)		127	126	124	133	135	135	-
Per day productivity (kg/ha)		40.8	29.8	30.5	32.0	35.3	32.6	-
% increase over checks		-	36.9	33.8	27.5	15.6	25.4	-

* Figures in parentheses indicate number of trials.

Table 2. Manurial trials on ASD 19 (1991-1993)

N levels (kg/ha)	Grain yield (t/ha)								% increase over ADT 39
	ASD 19				ADT 39				
	1991	1992	1993	Mean	1991	1992	1993	Mean	
0	3.4	2.3	4.3	3.29	3.4	2.9	3.2	3.18	3.7
50	4.6	3.0	4.6	4.09	5.0	3.0	3.4	3.80	7.7
100	5.4	3.3	4.9	4.52	5.0	3.2	3.5	3.88	16.5
150	5.0	3.4	5.0	4.46	5.6	3.6	3.6	4.27	4.5
200	5.9	3.6	5.0	4.83	5.4	3.8	3.7	4.29	12.7
Mean	4.0	3.1	4.8	3.97	4.1	3.3	3.5	3.61	10.0
	1991	1992	1993						
CD (P=0.05)	1.5	0.2	0.2						

Kanyakumari district, ASD 19 recorded a grain yield of 5.7 t/ha, the corresponding yield increase over ADT 39, IR 20 and CO 43 being 2.5, 10.8 and 1.2 percent respectively. It recorded a mean straw yield of 10.7 t/ha, the increase over the checks being 3.1 to 21.3 percent (Table 1)

In the AICRIP trials conducted during *Kharif* 1987, ASD 19 (IET 10436) registered a mean grain yield of 4.1 t/ha (mean for 5 centres), an increase of 6.3 per cent over the national check Jaya. During *Rabi* 1990, it was tested at Moncombu (Kerala) and Pondicherry, and it stood first by recording a mean grain yield of 4.7 t/ha with 30.0 percent increase over Jaya. In both the years ASD 19 recorded a mean yield of 4.3 t/ha with 13.8 per cent increase over Jaya (Table 1).

In the International Rice Observational Nursery conducted under the IRTP (INGER) during 1984, out of 31 trials laid out with ASD 19, it recorded a mean phenotypic acceptability rating of 6.1 compared to 5.4 by IR 36. During 1986, ASD 19 was tested in 18 trials where it recorded 5.3 score, compared to 5.5 by IR 36.

MKT were conducted at 100 centres during 1988-89, and 1992-93 in Chidambaranar district. During 1988-89 ASD 19 recorded a mean yield of 6.4 t/ha (mean for 50 trials) with a range of 5.9 to 7.3 t/ha. During 1992-93, it yielded on an average 6.3 t/ha (mean for 50 trials), the maximum being 7.2 t/ha and the minimum being 3.8 t/ha (Table 1.)

The overall mean yield of ASD 19 was 5.8 t/ha (mean for 240 trials) in 127 days; its corresponding increase in yield over IR 20 was 14.2 per cent while that over ADT 39, CO 43 and Ponni /White Ponni was 8.4, 11.9, and 13.2 per cent

respectively. The total biomass production of ASD 19 was 16.5 t/ha (5.8 t grain + 10.7 t of straw). Its potential grain yield was 11.0 t/ha as recorded at Siruthondanallur of Chidambarnar district in the ART of 1989-90 (Table 1).

At the Rice Research Station, Ambasamudram the perday productivity of ASD 19 was found to be 40.8 kg/ha, compared to 29.8, 30.5, 32.0, 32.6 and 35.3 kg/ha by IR 20, ADI 39, CO 43, Ponni/White Ponni and CO 45 respectively, the increase over checks being 15.6 (CO 45) to 36.9 (IR 20) per cent.

The total duration of ASD 19 at the station is 127 days, with a range of 120 to 132 days; its duration is comparable to that of IR 20 and ADT 39, but it is earlier by 6 to 8 days with a range of 4 to 16 days than CO43, C)45 and Ponni/White Ponni.

ASD 19 is semidwarf in height (108 cm) with short slender white rice and 9.59 per cent protein content. It has completely exerted panicle, and flag leaf remains at 90° during anthesis. It is moderately resistant to blast, and moderately tolerant to early drought.

Since the farmers of southern districts of Tamil nadu prefer varieties of 120 days (IR 20, ADT 39) in the *Pishanam* season for sowing during the first fortnight of October, rather than varieties of 135 to 140 days duration (CO 43, CO45, Ponni, White Ponni) in order to avoid water scarcity at fag end of crop growth period, ASD 19 is an ideal variety having less duration than CO 43, CO45, Ponni or White Ponni, and also higher per day productivity with quality rice.

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