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The role of certain foreign varieties in rice improvement in Cauvery delta of Madras State

by

T. G. SOUNDARARAJAN[1] and T. S. THEETHARAPPAN[2]

Synopsis: The attempts made towards introducing Chinese varieties of rice in the delta tract of Thanjavur in Madras State during the years 1951–'52 to 1959–'60 are discussed in detail. The results of the trials revealed their unsuitability for direct introduction but were best availed in hybridisation programmes.

Introduction: Among the various methods employed towards rice improvement, the one by "introduction" is by far the easiest and most rapid method. Varieties from Japan, Korea, Italy, America and China were given a fair trial in our country. From among the reports by rice workers, it could be gathered that none of these, except a few Chinese varieties was found to adapt themselves to the conditions existing in India. The study of the behaviour of Chinese varieties also opened the line of introducing desirable genes into *indica* varieties. In this paper, the details of a trial aimed at directly introducing Chinese varieties in Thanjavur delta are presented.

Review of Literature: The non-adaptability of rice varieties from Japan, Korea, Italy and America was reported by Ramiah and Rao (1953). Negi and Saini (1957) and Gursham Singh, Saini and Sucha Singh (1958) have reported the success of introducing Chinese varieties in Punjab Hills. Chatterjee (1952) has recorded the good performance of Chinese varieties in Uttar-Pradesh, West Bengal and Orissa. Ramiah (1953) and Negi (1955) have reported similar results in Kashmir valley. Encouraging results were obtained by Rajagopalan and Samad (1960) in Madras.

Materials and Methods: An attempt was also made in the Agricultural Research Station, Aduthurai to introduce the Chinese varieties in the intensive rice tract of Madras State representing the Old Cauvery Delta. Seeds of certain promising Chinese varieties of rice were received from the Central Rice Research Institute, Cuttack and were tried at the Agricultural Research Station, Aduthurai under different groupings, made according to their duration. The varieties were compared for their yield performance with popular departmental strains grown in the tract, for eight years commencing from 1951–'52 in replicated plots, the varieties having been randomised. Manuring and other agronomic and cultural practices followed were as followed in general in the tract. The flowering duration of the varieties was calculated by observing the period from sowing to the completion of flowering. The yield of grain was recorded after complete maturity. The data on yield were subjected to statistical scrutiny.

Results and Discussion: The grain yield figures recorded plot-wise in all the years of trial were analysed. The summed up results are tabulated and presented in tables I & II.

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[1] & [2] Assistants in Paddy, Rice Research Station, Ambasamudram.

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TABLE I

(95—110 days)

S. No.	Variety	Flowering duration in days	Yield of paddy in lb per acre								Mean	Yield expressed as per cent on standard
			1951–'52	1952–'53 *	1954–'55	1955–'56	1956–'57	1957–'58	1958–'59	1959–'60		
1.	CH. 2	66	N. T.	4449	2708	4901	3412	2174	3542	2414	3371	86·02
2.	CH. 41	72	N. T.	4471	3448	5242	3618	3085	3326	3158	3764	96·07
3.	CH. 42	71	N. T.	4347	4561	4834	3478	3076	2917	2450	3666	93·56
4.	CH. 43	74	N. T.	3816	4305	4288	3021	3244	3126	2777	3511	89·60
5.	CH. 45	77	2353	2705	4308	4901	3395	3575	3207	2496	3367	85·92
6.	ADT. 3 (STD)	69	2569	4315	4256	4901	3604	3694	4021	3984	3918	100·00
	C. D. if significant	...	...	939	507	666	313	366	386	215	...	...

TABLE II

(110—120 days)

S. No.	Variety	Flowering duration in days	Yield of paddy in lb per acre								Mean	Yield expressed as per cent on standard
			1951–'52	1952–'53 *	1954–'55	1955–'56	1956–'57	1957–'58	1958–'59	1959–'60		
1.	CH. 47	83	2259	3780	4133	3949	3025	2499	3079	2662	3173	85·74
2.	CH. 62	81	N. T.	4466	3894	N. T.	3517	3283	2992	2784	3489	79·23
3.	CH. 63	85	N. T.	4267	3841	4561	2965	2869	2845	2648	3428	77·84
4.	ADT. 9 (STD)	86	N. T.	5055	5097	5786	4205	3464	3856	3362	4404	100·00
	C. D. if significant	...	...	939	507	688	412	331	355	122	...	...

N. T.: Not tried

* The results of 1953—'54 vitiated due to stem-rot.

The results reveal the unworthiness of direct introduction of these varieties in the deltaic tract of Madras state because of their low yield potential and longer duration of crop growth.

A study of the morphological characters of these exotic varieties was however useful in utilising the desirable attributes in our hybridisation programme. The variety CH. 2, though of similar short duration as of ADT. 3, a promising, wide-spread strain, was low in yield. Other short duration Chinese varieties are longer in duration than ADT. 3. All the Chinese varieties possess a highly desirable quality of stiff straw resulting in complete absense of lodging even under mechanical causes like wind and heavy rains. This character could not be lost sight of as the loss in yield of rice due to lodging is considerable in the whole tract and outside where the harvest of short duration crops coincides with wet weather.

With the need for evolving non-lodging strain, a programme was made to combine the stiff-strawed nature of Chinese varieties and high yielding behaviour of already existing popular strains of the State. Highly promising hybrid selections are now available after successful execution of the plan. It is gratifying to note that certain progenies of the crosses between *indica* and Chinese varieties will have a good future of completely replacing the existing popular strains. Encouraging results were obtained from the trials with an offspring, 2701 of the cross between ADT. 3 and CH.42 as is seen from the following table.

Year of trial	Yield of grain in kg per acre		Increase over ADT. 3. as %
	2701	ADT. 3 (Standard)	
1959—'60	2104	1708	23.4
1960—'61	1818	1425	21.6
1961—'62	1894	1276	48.5
1962—'63	2084	1550	34.5
1963—'64	1612	1163	41.1
1964—'65	2580	1773	45.5
Mean	2020	1494	35.2

The selection, 2701 (ADT.3 x CH. 42) has been consistently superior to strain, ADT. 3 in yield in six years of replicated trials at the station with 35.2 per cent increased yield.

The selection was also tried in farmers' fields in different centres in the district and the results are furnished below :

S. No.	Location	Acre yield in kg		Percentage on standard.
		2701	ADT.3	
1.	Kankoduthuvanitham	1631	1222	133·5
2.	Aduthurai (farmers' holdings)	1264	927	136·4
3.	Thiruppanandal	1690	1650	102·4
4.	Pattukottai	1818	1659	109·5
5.	Orathur	1525	1150	132·6
6.	Nagamangalam	1405	1350	104·0
7.	Thirukkadayur	1812	1525	118·8
8.	Anathandavapuram	1639	1294	126·6
	General average	1598	1347	118·6

In the farmers' holdings, the selection, 2701 has recorded on an average, 18.6 per cent increased yield over ADT. 3, the popular strain of the tract.

Conclusion : From the results of the trials, it was decided that Chinese varieties were unfit for direct introduction in the Cauvery deltaic area. However, the quality of stiffness of straw of those varieties were infused into the locally popular strain, ADT.3 and a short-duration, high-yielding, non-lodging selection No. 2701 promising both in the trials conducted at the Research Station and farmers' fields has been isolated. The selection is also taken up for large scale demonstration and multiplication under a pilot project during 1965–'66.

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REFERENCES

Chatterjee, U. N. 1952 Trials with Chinese varieties of paddy - *Indian Farming* **11** (7), 32–5.

Gursham Singh, Soban Singh Saini and Sucha Singh 1958 Ch. 986-A new variety for Punjab Hills. *Rice News Teller* **6** (1) 14–16.

Negi. B. S. 1955 A high yielding strain for Kulu vally - 43 Dunder rice. *Rice News Teller*, **3** (2) 17–21.

—— and S. S. Saini 1957 Chinese varieties have future in Punjab Hills *Rice News Teller*, **5** (1), 5–9.

Rajagopalan. K. and A. Abdul Samad 1960 *Rice News Teller*, **8** (4), 9–19.

Ramiah. K. 1953 *Rice breeding and Genetics - Sci Monograph*, I. C. A. R., 360 pp.

—— and M. B. V. Narasinga Rao 1953 *Rice breeding and Genetics - Part*, 2, 36–37.