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EFFECT OF SEED SOURCE ON SEED YIELD AND SEED QUALITY CHARACTERS IN SHORT DURATION RICE CULTIVAR ADT 36.

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ABSTRCT

Studies were undertaken to study the effect of sources of seeds from improved seed and farmer's saved seeds. On farm trials were conducted during kuruvai 1992 - 95 season in 20 divisions of Thanjavur, Thiruvarur and Nagapattinum districts. From the results it could be concluded that irrespective of locations, the crop raised from the improved seed source recorded higher seed yield and seed quality values compared to farmer's own saved seeds.

KEY WORDS : Seed source, seed yield, seed quality characters, rice

Rice seed production demonstration trials were laidout during kuruvai season to identify the suitable places for rice seed production in Cauvery Delta region of Thanjavur, Thiruvarur and Nagapattinum districts. Seeds produced in a particular season shows variations in morphophysical characters. Crop management practices have direct relationship in determining most of the seed quality characters. Under these circumstances on-farm trials were conducted during kuruvai 1992 - 95 season in all the divisions of Thanjavur, Thiruvarur and Nagapattinum districts of Tamil Nadu.

MATERIALS AND METHODS

One day training on improved seed production technology in rice was given to the farmers, identified from Thanjavur, Thiruvarur and Nagapattinum districts, before the commencement of the season in a phased manner from 1992 - 95, Breeder seeds of ADT 36, a short duration rice variety obtained from Tamil Nadu Rice Research Institute, Aduthurai were given to trained farmers and the crops were raised in their holdings (T_1) along with farmers' saved seeds as control (T_2). The package of practices were followed as per standard recommendations starting from sowing to till harvest.

Periodical inspection were made to carryout roguing and other cultural operations for maintaining the physical and genetic purity of the crop. The observations on plant height, panicle weight, 100 seeds weight were recorded from the crops raised in the above 20 locations (L_1 - L_{20}). The seed samples collected from different locations were evaluated for seed quality attributes. Seed germination test was carried out adopting the procedure out lined by ISTA (1985). The seedling root length, shoot length, and dry matter production were also recorded.

The data collected were analysed statistically adopting the procedure outlined by Panse and Sukhatme (1967).

Details of trials laidout during 1992 - 93 Kuruvai season :

	Division	Village	District	Season
1.	Papanasam	Thirupalathurai Papanasam	Thanjavur	Kuruvai
2.	Thiruvaiyaru	Kandiyur Thirupalanam	Thanjavur	Kuruvai
3.	Thanjavur	Ramapuram Punnainallur	Thanjavur	Kuruvai
4.	Thiruthurai-Poondi	Edaiyur Sankathi	Thirvarur	Kuruvai
5.	Nagapattinam	Sikkal	Nagapattinum	Kuruvai
6.	Sirkali	Thenpathi	Nagapattinum	Kuruvai
7.	Thiruvarur	Ponveli Maruthapattinam Maruthapadi	Thiruvarur	Kuruvai

Details of trials laidout during 1993 - 94 kuruvai season :

	Division	Village	District	Season
8.	Kumbakonam	Asoor	Thanjavur	Kuruvai
9.	Valangaiman	Vidayal karupur	Thiruvarur	Kuruvai
10.	Pattukottai	Andami	Thanjavur	Kuruvai
11.	Mayiladu-thurai	Nagangudi Senthiruppu	Nagapattinum	Kuruvai
12.	Sembanar-koil	Vellam Annapanpettai	Nagapattinum	Kuruvai
13.	Needa-mangalam	Periyakottai Pullavarayan-Kudikadu	Thiruvarur	Kuruvai
14.	Nannilam	Achutha mangalam	Thiruvarur	Kuruvai
15	Mannargudi	Kuthanallur	Thiruvarur	Kuruvai

Details of trials laidout during 1994 - 95 kuruvai season :

Division	Village	District	Season
16. Thiruvidai-maruthur	Kathiramangalam	Thanjavur	Kuruvai
17. Orathanadu	Papanadu	Thanjavur	Kuruvai
18. Peraurani	Thuravikadu	Thanjavur	Kuruvai
19. Kudavasal	Pathur	Thiruvarur	Kuruvai
20. Vedaranyam	Uthirangudi	Nagapattinum	Kuruvai

Abbreviations :

T 1 : Seed crop ; T 2 : Control Crop : L 1 - L 20 : Location

RESULTS AND DISCUSSION

Kuruvai 1992 - 93 season :

Among the different locations, the significant differences were recorded between the seed crop and control crop (Table 1). The seed crop raised from improved source, recorded higher yield attributes than control crop interms of plant height, panicle weight and 100 seed weight.

The plant height recorded in Edaiyursanganthi, Papanasam and Thirupalathurai were maximum (158, 153 and 152 cm respectively); while it was minimum in Thenpathi (76 cm).

The panicle weight recorded at Sikkal (3.442 g) and Ponveli (3.388 g) was maximum followed by Edaiyuysanganthi and it was minimum in Ramapuram and Thenpathi. (1.940 g and 1.633 g respectively).

The highest and lowest 100- seed weight was recorded at Thirupalathurai (2.179 g) and Thenpathi (1.900 g) seed crop.

Seed germination and dry matter production recorded at Thenpathi was higher (98 % and 146 mg respectively) and it was lower in Thirupalathurai and Thirupalanam.

The root length recorded at Edaiyur was longest (22.2 cm) followed by Ponveli (22.1 cm) and Sikkal ?(22.0 cm) and the same was shortest in Thirupalathurai (18.4 cm).

The shoot length recorded at Thenpathi was longest (16.5 cm) and it was shortest in Ponveli (10.7 cm).

Kuruvai 1993 - 94 season :

Irrespective of the locations, significant differences were recorded between the seed crop and control crop (Table 2).

Among the different locations, Vidayal Karuppur recorded maximum plant height (109 cm) and it was minimum in Pulaavarayankudikadi (91 cm).

The panicle weight recorded at Senthiruppu was maximum (3.160 g) followed by Kuthanallur (3.041 g) and Andami (3.035 g). Seeds collected from Pullavarayankudikadu registered lowest panicle weight (1.732 g).

The 100 seed weight observed was higher (2.388 g) at Vidayalkaruppur, while it was lower (1.969 g) at Vallam.

The germination per cent observed was maximum at Senthiruppu (100) followed by

Table 1. Provenance effect on seed yield and seed quality attributes of seed crop control crop raised during Kuruvai 1992-93 cv. ADT 36.

Location	Plant height (cm)		Panicle weight (g)		100 seed weight (g)		Germination (%)		Root length (cm)		Shoot length (cm)		Dry matter production (mg)	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
L1 Ramapuram	78	77	1.940	1.655	2.087	2.013	91.00	85.0	19.8	19.3	12.1	11.5	139.50	129.00
L2 Kandiyur -	97	93	2.400	2.198	2.164	2.147	93.0	77.0	19.5	19.5	11.1	9.7	128.50	119.00
L3 Thirupazhnam	97	93	2.513	2.246	2.143	2.090	84.0	81.0	18.4	18.4	11.1	11.0	140 50	137.50
L4 Papanasam	152	152	2.400	1.887	2.154	1.981	85.0	75.0	19.3	17.3	12.2	11.8	127.50	124.50
L5 Thirupalathurai	153	152	2.412	2.035	2.179	2.095	86.0	80.0	18.4	18.1	11.4	11.2	128.50	128.00
L6 Thenpathi	76	65	1.633	1.468	1.900	1.891	98.0	62.0	20.7	18.7	16.5	15.8	146.00	125.50
L7 Sikkal	102	100	3.442	3.344	2.061	2.011	81.0	73.0	22.0	21.3	11.0	10.4	130.50	127 00
L8 Ponveli	105	102	3.388	3.218	2.078	2.025	88.0	76.0	22.1	21.7	10.7	10.8	136 50	128.00
L9 Edayur sangathi	158	156	2.976	2.973	2.374	2.314	77.0	67.0	22.2	21.0	10.9	10.7	136.50	130.00
CD (P=0.05%) T1	1.29**		0.13**		0.03**		2.18**		0.21**		0.32**		2.00**	
L	2.74**		0.28**		0.06**		4.62**		0.44**		0 67**		6.00**	
TXL	2.87*		NS		NS		6.53**		0.62**		NS		NS	

T1 - Seed crop ; T2 - Control crop

Table 2. Provenance effect on yield and quality attributes of paddy cv. ADT 36 raised during Kuruvai 1993-94.

Location	Plant height (cm)		Panicle weight (g)		100 seed weight (g)		Germination (%)		Root length (cm)		Shoot length (cm)		Dry matter production (mg)	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
L1 Asoor	97	98	2.096	2.809	2.063	2.060	85.0	79.0	15.2	14.4	14.6	12.9	157.50	138.00
L2 Vidayalkarupur	109	102	2.796	2.632	2.388	2.057	82.0	78.5	16.0	15.8	14.2	14.0	132.50	107.00
L3 Andami	102	89	3.035	2.839	2.130	2.063	94.0	84.0	14.8	12.6	14.3	14.2	151.00	155.50
L4 Senthiruppu	108	98	3.160	2.536	2.077	2.078	100.0	90.0	17.5	17.6	14.7	14.4	153.50	141.00
L5 Nagangudi	97	92	2.975	2.477	2.099	2.072	99.0	92.0	19.1	18.2	13.2	12.7	134.50	130.00
L6 Vallam	102	94	2.709	2.686	1.969	1.964	92.0	89.5	18.4	17.6	14.1	13.6	148.50	132.50
L7 Achuthamangalam	104	114	2.955	2.522	2.024	1.953	98.0	83.0	14.1	13.3	14.0	12.6	131.00	129.00
L8 Pullavarayanku-dikadu	91	88	1.732	1.714	1.978	1.964	94.0	85.0	12.4	13.1	12.6	11.0	128.0	109.50
L9 Koothanallur	96	94	3.041	2.730	2.125	2.094	89.0	84.0	15.1	12.3	14.4	14.0	144.00	137.00
L10 Annappanpettai	101	97	2.813	2.549	1.988	1.985	66.0	60.0	15.9	14.4	14.4	13.3	135.50	131.00
CD (P=0.05%)														
T -	2.16**		0.23**		NS		2.35**		0.54**		0.25**		3**	
L -	4.58**		0.50**		NS		5.26**		1.21**		0.96**		7**	
TXL -	6.48**		0.70**		NS		NS		NS		NS		NS	

T1 - Seed crop ; T2 - Control crop

Nagangudi (99) and seeds collected from Annappanpettai registered lowest per cent of germination (66).

Longest and shortest seedling root length was noticed at Nagangudi (19.1 cm) and Pullavarayankudikadu (12.4 cm). The shoot length recorded was maximum at Senthiruppu (14.7 cm) and it was minimum at Pullavarayangudikadu (12.6 cm).

The seedling dry matter production recorded at Azoor was heighest (157.5 mg) followed by Senthiruppu (153.5 mg) ; while it was lowest at Pullavarayankudikadu (128 mg).

Kuruvai 1994 - 95 season :

Seed crop raised from improved source, recorded higher seed yield and seed quality attributes than control crop. Significant differences were noticed among different locations.

The plant height recorded at Kathiramangalam was maximum (104 cm) and it was minimum in Papanadu (96 cm).

The panicle weight and 100 seed weight recorded at Kathiramangalam was maximum (3.230 g and 2.400 g respectively) and the same was minimum in Uthirangudi (2.055 g and 1.946 g respectively)

The seed quality attributes interms of germination, root and shoot lenths recorded at Kathiramangalam was higher (91 %, 16.9 cm and 15.7 cm respectively) ; while it was lower in Uthirangudi (82 %, 13.3 cm, 12.8 cm respectively).

The dry matter production of the seedlings recorded was maximum (158 mg) at Pathur followed by Kathiramangalam (153 mg) and the same was minimum at Uthirangudi (124 mg).

The farmers used their own seeds repeatedly (or) buy poor quality seeds from neighbours. Repeated use of these poor quality seeds directly hamper the crop production. The influence of season and location on seed production is well established. Seed produced in a particular season shows variations in morphophysical characters. Crop management practices have direct relationship in determining most of the seed quality characters.

The findings are in confirmity with those of Landmark (1983), in oats, barley, winter wheat and spring wheat, that 1000 seed weight varied due to provinances. Irrespective of the locations the crop raised from the improved seed source performed better than control crop. Seed yield was more from the quality seeds than that obtained from farmer's own stock (Chandgiram *et al.*, 1987).

The seed germination recorded was more than 80 per cent in improved seed source whereas it was less than 80 per cent in control treatment. Selvaraj and Subramanian (1988) reported that, in rice the

Table 3. Provenance effect on yield attributes of seed crop and control crop raised during 1994-95 of paddy cv. ADT 36.

Location	Plant height (cm)		Panicle weight (g)		100 seed weight (g)		Germination (%)		Root length (cm)		Shoot length (cm)		Dry matter production (mg)	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
L1 Kathiramangalam	104	102	3.231	3.093	2.400	2.321	91.0	86.0	16.9	16.5	15.7	15.3	153.00	141.00
L2 Papanadu	96	93	2.203	2.031	2.147	2.042	84.0	81.0	14.1	13.6	13.1	12.9	132.00	129.00
L3 Thuravikkadu	98	96	2.499	2.117	2.130	1.987	85.0	85.0	14.1	14.0	13.9	13.7	128.50	116.00
L4 Pathur	103	100	3.146	2.931	2.347	2.103	89.0	87.0	16.7	16.4	15.3	15.0	158.00	146.00
L5 Uthirangudi	96	93	2.055	1.799	1.946	2.884	82.0	81.0	13.3	12.3	12.8	12.0	124.00	116.00
CD (P=0.05%)														
T	2.17**		0.10**		NS		1.27**		0.32**		0.25**		2.32**	
L	3.42**		0.16**		0.26**		2.01**		1.54**		1.23**		1.64**	
TXL	NS		NS		NS		NS **		NS		NS		NS	

T1 - Seed crop ; T2 - Control crop

yield potential and seed quality declined with advancement of generation. Seeds produced from Thanjavur division and Thiruvaiyaru division were found to be superior in terms of germination compared to other locations. The seedling growth varied with different locations and this is due to the favourable agro-ecological conditions in the old Cauvery Delta region for quality seed production as reported by Thiagarajan *et al.* (1989).

The seed crop raised from the improved seed source recorded higher values than control crop interms of seedling drymatter production. The results indicated that, soil, climatic conditions, tillage practices, and place of production influenced seed quality significantly as reported by Strasil (1988) in barley, Vanangamudi and Karivaratharaju (1985) and Krishnasamy (1977) in sorghum.

Nazmulhuda (1990) reported that significant differences in germination percentage, purity standard and yield between farmer's saved seeds and using certified seeds. The farmer's own seeds were found inferior to certified seeds in one (or) more quality characters. This confirms the results of Kannan (1985) Ganesan (1987) and Ishratullah *et al.* (1989) in soybean crop.

From this study it was clear that, irrespective of locations, the seed crop raised from the improved seed (Breeder seeds) source recorded higher seed quality values compared to farmer's own saved seeds.

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