

## Effect of presoaking of paddy seeds in different concentrations of sodium bi-carbonate solution on the yield of paddy

by

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**Synopsis:** The results of an experiment conducted at the Agricultural Research Station, Palur between 1958 to '64 to find out the differential effect of presoaking of paddy seeds in different strengths of sodium bi-carbonate solution on the yield of paddy are presented. The results of trials, did not indicate significant improvement in grain yield due to treatments with the chemical.

**Introduction :** Treating seeds in nutrients like phosphate and magnesium before sowing as an improved technique in the cultivation of field crops for increasing crop production has been under experimentation in the country and elsewhere and the results were found to be promising. The investigation was undertaken in order to test whether the chemicals like sodium bicarbonate of different concentrations can improve the yield of paddy if the seeds are soaked before sowing. Previous experiments conducted at Paddy Breeding Station, Coimbatore (1949-'51) by soaking seed in 10 and 20 per cent of potassium metaphosphate and 13 per cent of magnesium chloride and magnesium sulphate showed 10-13 per cent increase in yield in the case of potassium metaphosphate. Narayanan and Gopalakrishnan (1949) conducted pot culture experiments with rice seed, and obtained 21.1 per cent and 38.8 per cent increase in grain yield by soaking seed in 10 and 20 per cent solution of  $K_3 P O_5$  respectively and 10.9 per cent increase with 20 per cent solution of  $K_2 HPO_4$ . Ghose *et al* (1956) have reported that soaking rice seed in 10 and 20 per cent solution of  $K_2 HPO_4$  gave 8 to 9 per cent increase in yield.

**Materials and Method :** Based on a suggestion by the Indian delegation to China, an experiment was conducted at Agricultural Research Station, Palur in South Arcot district from 1958-'59 to 1964-'65 to find out the differences if any, on the yield of paddy due to treatment with sodium bi-carbonate. The experiment was conducted in the *Samba* and *Navarai* seasons for one year and in all three seasons *viz.*, *Sornavari*, *Samba* and *Navarai* in the succeeding five years. The trial in the *Sornavari* season was concluded in 1964-65. There were five treatments and the variety used was *TKM. 6* for *Sornavari* and *Navarai* seasons and *PLR. 1* for *Samba* season for the first two years and *GEB. 24* for the next four years. The seeds were soaked in the solution prepared with different concentrations, stirred

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well so as to get uniform coating of the chemical on the seed and left for 48 hours. The seeds were removed from the container and kept in a dark corner for 12 hours before sowing. Germination test was conducted in germination trays and germination percentage of seeds from each treatment was recorded. The experiment was laid out with the following treatments :

1. No pre-treatment of paddy seeds (Control)
2. Soaking seeds in 2.8% solution of sodium bi-carbonate for 48 hours before sowing.
3.        "        4.8%        "        "
4.        "        6.8%        "        "
5.        "        8.8%        "        "

The field was manured with a basal dressing of 2,270 kg of green leaves, 70 kg of super phosphate and 35 kg of ammonium sulphate per acre. Another dose of 35 kg of ammonium sulphate per acre was top dressed 30 days after planting for *Sornavari* and *Navarai* crops and 60 days after planting for *Samba* Crop. The crop was harvested and the yield of grain from each plot was recorded and the data statistically analysed. The first two crops in each season were under observational trial.

**Results and Discussion :** The summary of results on grain yield for all the seasons and the germination test of treated seeds are furnished in Tables I and II respectively. In the observational trials, the results of the *Samba* season of 1958-'59 showed that none of the treatments recorded better yield than the control while in *Navarai* season all treatments except treatment No. 4 gave higher yields than the control. In 1959-'60 the results of the three season trials revealed that treatments with 6.8 per cent 2.8 per cent and 8.8 per cent solutions of sodium bicarbonate recorded slightly higher yield than control. In 1960-'61 *Sornavari* season, treatments with 4.8 per cent and 6.8 per cent solutions yielded better than control.

The results of the experiment laid out in randomised replicated blocks showed that the yield differences were not significant for the *Samba* and *Navarai* seasons in all the four years. In the *Sornavari* season during the first year of the trial, the yield differences were significant and treatment No. 4, where seeds were soaked in 6.8 per cent solution of sodium bi-carbonate recorded the highest yield but was on par with control. In the next year the trial was vitiated due to severe drought. In the third and the fourth year of trial, the yield differences were not significant. The results thus, showed that there was no advantage in treating paddy seeds in sodium bi-carbonate solution prior to sowing either for shorter or long duration crops of paddy. It is also seen from Table II that the germination of seed got gradually reduced as the concentration of the chemical was increased.

TABLE I.

(Acre yield in kg)

Season and crop	Year	Control (1)		2.8% (2)		4.8% (3)		6.8% (4)		8.8% (5)		G. M.		S. E.		F test satisfied or not	C. D. P=0.05
		Ac. Yd.	% on control	Ac. Yd.	% on control	Ac. Yd.	% on control	Ac. Yd.	% on control	Ac. Yd.	% on control	Ac. Yd.	% on control	Ac. Yd.	% on control		
Sornavari	1959-'60	1572	100	1632	103.9	1553	98.7	1695	107.7	1610	102.4	1613	102.6	Observational		trial	
	1960-'61	1022	100	1030	100.9	1108	108.4	1114	108.0	1016	99.4	1058	103.5	Observational		trial	
	1961-'62	1264	100	1318	104.2	1312	103.8	1319	107.5	922	88.8	1326	104.1	60	4.7	Yes	172 13.6
	1962-'63	(The trial was vitiated due to severe drought)															
Samba	1963-'64	1668	100	1232	73.8	1262	75.6	1285	77.0	1281	76.7	1280	76.7	73	4.4	Not	
	1964-'65	1193	100	1093	91.6	1193	100	1226	102.8	1169	98.2	1177	98.6	133	11.2	Not	
	1958-'59	1638	100	1563	95.3	1614	99.3	1495	91.2	1523	92.9	1566	95.7	Observational		trial	
	1959-'60	1385	100	1608	116.2	1414	102.1	1416	102.3	1416	102.3	1447	104.6	Observational		trial	
GEB21.	1960-'61	635	100	629	99.0	615	96.9	606	95.4	585	92.0	614	96.7	27	4.3	Not	
	1961-'62	605	100	862	140.3	762	124	803	130.7	845	137.5	599	97.4	61	9.0	Not	
	1962-'63	718	100	686	95.4	675	93.9	751	104.5	731	101.8	712	99.1	65	9.0	Not	
	1963-'64	1171	100	1220	104.2	1215	104	1245	106.3	1165	99.4	1202	102.7	38	3.2	Not	
Navarai	1958-'59	1044	100	1137	108.9	1091	104.4	1001	95.8	1066	102.8	1068	102.2	Observational		trial	
	1959-'60	1504	100	1397	92.8	1539	102.3	1413	87.8	1708	113.6	1495	99.3	Observational		trial	
	1960-'61	1043	100	1056	97.8	1074	99.4	1074	99.4	1061	98.3	1069	99.0	49	4.5	Not	
	1961-'62	1268	100	1303	102.8	1207	95.2	1327	104.7	1315	103.8	1283	101.3	79	20.8	Not	
TKM. 6	1962-'63	981	100	968	98.7	974	99.7	987	100.6	1022	105.6	986	100.5	3	0.3	Not	
	1963-'64	1264	100	1282	101.4	1292	102.2	1231	97.3	1345	106.4	1283	101.5	33	2.7	Not	

TABLE II  
Percentage Germination of treated seeds in different concentrations of sodium bi-carbonate solution.

Season and crop	Year	Control	2.8%	4.8%	6.8%	8.8%
Sornarari	TKM. 6					
	1959-60	90	96	94	93	90
	1960-61	90	97	96	95	90
	1961-62	93	90	80	88	84
	1962-63	99	96	95	93	93
	1963-64	99	96	95	94	96
Samba	1964-65	98	95	94	91	88
	PLR. 1					
	1959-60	98	97	96	95	90
	GEB-24					
	1960-61	97	95	94	93	89
	1961-62	96	93	89	87	88
Nararai	"					
	1962-63	98	98	96	95	93
	"					
	1963-64	100	99	96	95	94
	TKM. 6					
	1958-59	99	87	85	85	84
Nararai	1959-60	98	97	96	95	93
	1960-61	99	98	97	96	94
	1961-62	98	96	96	95	93
	1962-63	99	98	97	96	95
	"					
	1963-64	98	97	96	95	93

**Summary:** At the Agricultural Research Station, Palur trials were conducted to test the effect of soaking paddy seed in solution of sodium bi-carbonate of different concentrations before sowing on the yield of paddy. It was concluded that there was no significant increase in the yield of paddy due to pre-soaking.

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