Agri. Res. *J. Kerala*, *1975*, *13* (2) 136—140

STUDY ON THE COMPARATIVE PERFORMANCE OF UREA AND NEEM COATED UREA ON THE YIELD AND YIELD ATTRIBUTES OF RICE - VARIETY TRIVENI

C. ABRAHAM, N. SADANANDAN and V, K. SASIDHAR

College of Agriculture Vellayani, Kerala

It is a well recognised fact that application of adequate quantities of fertilizers is a necessary input for stepping up crop yields and this input has to be efficiently utilised by the crops. It has been established that about 40% of the nitrogen applied to rice crop is lost by various means. These losses should be minimised to the possible extent in order to make use of the applied nitrogen profitably. The use of nitrification retarders is a novel approach to the problem of reducing the losses of nitrogen and thus increasing its efficiency. Although the superiority of neem cake as a nitrification retarder was known to the scientists, this character of neem cake has not been tested so far under Kerala conditions. Therefore, an experiment was undertaken at the College of Agriculture, Vellayani to study the merit of neem cake as an agent to increase the efficiency of fertilizer nitrogen applied to wet land rice.

Materials and Methods

The experiment was conducted during virippu season of 197.1 in the farm attached to the Agricultural College Vellayani. The soil of the experimental, area was sandyclay loam containing 0.075% total nitrogen, 0.0025% available phosphorus and 0.0077% available potash with a pH of 5.4. The treatments consisted of four levels of nitrogen (0, 40, 80 and 120 kg N/ha) and five methods of application as follows

f. Complete basal application of area, (2) Complete basal application of neem coated urea *(3)* 75% basal urea + 25% urea as top dressing- (4) 75% basal urea + 25% neem coated urea as top dressing (5; 75% basal neem coated urea + 25% neem coated urea as top dressing. The experiment was laid out in randomised block design with three replications. Neem cake was mixed with urea at the rate of 20% of the weight of the urea. The entire doses of phosphorus and potash were applied (at the rate of 34 kg/ha each) as basal application. Nitrogen was applied as urea and neem coated urea as per the treatments. Top dressing of nitrogen was done 20 days after transplanting. The rice variety Triveni which is of short duration and high yielding was used in the experiment.

Results and Discussion

Data on the effect of treatments on the yield and yield attributes of rice are presented in Tables I a, t b, 1 c and l d.

Table 1 (a)

The effect of nitrogen rates and methods of application on yield attributes

Treatments	Panicles per sq. metre	1000 grain weight	mean number of sterile spikelets	mean number of filled grains	Yield of gram kg/ha	Yield of straw kg/ha	Grain straw ratio
Levels of nitrogen							
0 kg/ha	300.000	22.960	12.000	67.460	2901	4258	0.695
40 ,,	511.670	23.375	13.330	73.275	3788	5791	0.661
80	550.000	23.587	14.170	72.000	4350	6366	0.691
120	572.000	23.813	14 870	74.326	4112	6607	0.621
F test between levels	sig	sig	not sig	not sig	sig	sig	sig
S. Em ±	14.310	0.025	1.460	3.818	69	194	0.020
C. D. (0.05)	41.310	0.073	...	...	201	559	0.057
F test treatments Vs. Control	sig	sig	not sig	not sig	sig	sig	not sig
S. Em ±	32.020	0.056	3.260	8.760	155	433	0.043
C. D. (0.05)	92.440	0.162	—	—	449	1250	—
Methods of application							
MI	508.330	23.318	14.440	70.033	3881	6085	0.648
M_2	555.560	23.690	13.670	76.120	4222	6353	0.661
M_3	558.330	23.607	10.780	75.220	4055	6167	0.669
M_4	552.780	23.647	14.110	69.440	4103	6206	0.656
M_5	547.780	23.689	12.210	75.000	4151	6466	0.654
F test	not sig	sig	not sig	not sig	not sig	not sig	not sig
S Em ±	18.480	0.033	1.880	5.077	90	250	0.025
C. D. (0.5)		0.095				—	—

Table I (b)

Number of Panicles per square metre

		M_1	M_2	M_3	M_4	M_5	Mean
	40	491.670	516.670	550.000	500.000	500 000	511.670
N	80	483.330	566.670	574.000	472.000	550.000	550.000
	120	550.000	583.330	550.000	583.330	593.330	572.000
Mean		508.330	555.560	558.330	552.780	547.780	

Control = 300.00 S. Em ± 32.02

F Test for interaction — sig C, D. (0,05) = 92.44

Table I (c)

Thousand grain weight

		Mr	M_2	M_3	M_4	M_5	Mean
	40	23.110	23.510	23.408	23.380	23.467	23.375
N	80	23.133	23.670	23.673	23,707	23.783	23.587
	120	23,713	23.691	23.808	23.857	23.853	23.812
Mean		23.318	23.690	23.607	23.647	23.689	

Control = 22.960 S. Em ± 0.056

F test for interaction — sig C. D. (0.05) = 0.162

Table 1 (d)

Yield of grain in kg ha

		M,	M_2	M_3	M_4	M_5	Mean
	40	3636	3962	3674	3818	3840	3788
N	80	4219	4439	4272	43 10	4507	4350
	120	3787	4265	4219	418t	4105	4112
Mean		3881	4222	4055	4103	4151	

Control = 2901 S. Em. ± 155

F Test for interaction — sig C. D. (0 05) = 449

It may be seen from the Table that graded doses of nitrogen gave significant increases in the number of panicles per square meter, thousand grain weight, yield of grain and yield of straw. Increased number of panicles with increasing levels of nitrogen has been reported by Tanaka *et al.* (1964) and Sewa Ram *et al* (1973). Since the accumulation of carbohydrates in the spikelets was favoured to a very high degree by increasing the nitrogen levels, it is but natural that thousand grain weight increased with increasing grain weight together with the increase in number of panicles per square meter had a cumulative effect in increasing the yield of grain.

The grain / straw ratio was also influenced by nitrogen levels. Decrease in grain / straw ratio with increased nitrogen supply was reported by Tanaka (1964).

The method of application did not show any influence on the number of panicles per sq. meter. mean number of sterile spikelets, mean number of filled grains, yield of grain and straw and grain / straw ratio. There was no significant difference in thousand grain weight between split application and full basal application of neem coated urea. This may be due to the control of losses of nitrogen by neem cake, making nitrogen available throughout the growing season of the crop. Bains *et al* (1971) reported that neem coated urea gave significantly higher thousand grain weight than urea.

The interaction between nitrogen levels and methods of application was significant in the case of number of panicles per square meter, thousand grain weight and yield of grain. It was found that 40 kg nitrogen in the form of neem coated urea was on par with 80 kg nitrogen in the form of urea as far as the number of panicles per square meter and yield of grain. At 40 kg. nitrogen level neem coated urea was significantly superior to urea at 80 kg N/ha level in case of 1000 grain weight. These results are in agreement with findings of Bains *et al* (1971)

Summary

A field experiment to study the comparative performance of urea and neem coated urea on the yield and yield attributes of rice variety-Triveni was conducted at the College of Agriculture, Vellayani, Kerala during Virrippu season of 1973. The treatments consisted of four levels of nitrogen (0), 40, 80 and 120 kg N/ha) and five methods of applications ie. (1) full basal urea (2) full basal neem coated urea (3) 75% basa! urea + 25% urea as top dressing (4) 75% basal urea + 25% neem coated urea as top dressing, and (5) 75% basal neem coated urea + 25% neem coated urea as top dressing. It was found that the number of panicles per square meter, 1000 grain weight and yield of grain and straw were increased by nitrogen application. The application of 40 kg nitrogen as neem coated urea was found to be equivalent to 80 kg nitrogen as urea as far as the yield of grain was concerned. The results showed that neem cake can be profitably used to increase the efficiency of urea applied to wet land rice.

സംഗ്രഹം

യൂറിയ roicnlooa'ajo , യൂറിയ വേപ്പിൻ പിണ്ണാക്കു് പൂശിയും നൽകുന്നതുകൊണ്ടു് വിളവിലും, വിളവുല്പാദനഘടകങ്ങളിലും ഉണ്ടാകുന്ന വ്യത്യാസങ്ങളും മനസ്സിലാക്കുന്നതിനുവേണ്ടി വെള്ളായണി കാർഷിക കോളേജിൽ 1973–ലെ വിരിപ്പു നെൽക്കൃഷിക്കാലത്തു് ഒരു പരീക്ഷണം നടത്തുകയുണ്ടായി.

ഒരു ചതുരശ്ര മീറ്ററിനകത്തുള്ള കതിരുകളുടെ എണ്ണം, 1000 നെൽമണികളുടെ ഭാരം, നെല്ലിൻറേയും, വയ്ക്കോലിൻറേയും വിളവു് എന്നിവ നൈട്രജൻ കൂടുതൽ കൂടുതൽ നൽകുന്നതനുസരിച്ചു് വർദ്ധിക്കുന്നതായി പരീക്ഷണത്തിൽ നിന്നും മനസ്സിലായി. പരീക്ഷണത്തിൽ നിന്നും മനസ്സിലായ മറ്റൊരു കാര്യം നെല്ലിൻറെ ഉല്പാദനം വെച്ചു നോക്കുകയാണെങ്കിൽ 40 കി ഗ്രാം നൈട്രജൻ വേപ്പിൻ പിണ്ണാക്കു് പൂശിയ യൂറിയയായി നൽകുന്നതു് 80 കിലോഗ്രാം നൈട്രജൻ യൂറിയാ തനിയേ നൽകുന്നതിനു സമമാണെന്നാണു്.

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(*M. S. received: 28-1-1974*)