maximum points. Hence these samples were used for storage studies. Biochemical analysis was also carried out for the dehydrated samples and the values are presented in Table. 3.

The ascorbic acid retention was comparatively higher at 50°C with 0.4 per cent KMS level. The sugar content was significantly higher at 50°C - control and the non-enzymatic browning was significantly minimum at 60°C -0.3 percent KMS level which showed that the sulphitation of onion flakes helped in retention of ascorbic acid and its natural colour. At the same time the sugar content was slightly reduced due to sulphitation.

From the packaging and storage studies (Table 4), it is observed that a progressive increase in moisture content from 5.55 to 5.85% (b) and reduced in ascorbic acid content (mg/100g) from 6.76 to 6.12. But these changes are comparatively lesser in vacuum storage method.

It is concluded that the browning was significantly lesser in the onion slices dehydrated at 60°C with 0.3 per cent KMS level. The optimum influence of temperature and pre-treatment level to control browning and preservation was at 60°C with 0.3 per cent KMS level. The dehydrated onion flakes could be preserved in thick vacuum packs for consumption.

References

Kalra, C.L. (1987). Harvesting, handling, storage, chemistry and technology of Onion : A resume *Ind. fd. Pack.* 41:17-25

Osborne and Voogt. (1978). The Analysis of Nutrient in Foods. Academic Press, New York.

Pawar, V.N., Singh, I.N., Dev, D.N,., Kulkarni, D.N. and Ingle, V.M. (1988). Solar drying of white onion flakes. *Ind. Fd. Pack.* **42**: 14-28.

Ranganna, S. 1979. Manual of Analysis of Fruits and Vegetable Products. Tata McGraw-Hill Publishing Company Ltd., New Delhi.

Sadasivam, S. and Manickam,A. 1990. Biochemical Methods for Agri Sciences, Wiley Eastern Ltd., New Delhi.

Sethi, V., Anand, I.C. and Bhagahandi, P.M. 1973. Quality screening of white onion cultivars for use in dehydration. *Ind. Fd. Pack.* **27** : 2-8.

(Received : April 2000; Revised : August 2001)

Madras Agric. J. 88(7-9): 403-406 July-September 2001
https://doi.org/10.29321/MAJ.10.A00354

Evaluation of coated DAP and nimin coated urea on available P status of wetland rice soil

M. SELVALAKSHMI AND L. DEVARAJAN
Department of Soil Science & Agrl. Chemistry, Tamil Nadu Agrl. University, Coimbatore - 641 003.

Abstract : To evaluate the efficiency of coated DAP in rice variety ADT 36 (Short duration: 105-110 days in *Kuruvai* season) and Nimin coated urea in rice variety IR 20 (Medium duration: 130-135 days in late samba season), two field experiments were conducted on a low P available loamy sand soil (Udic Ustropept) at Agricultural Research Station, Bhavanisagar during the period 1997-98. Phosphorus was applied at levels 100, 80 and 60 per cent of recommended P as coated and uncoated DAP and recommended dose of N was coated with Nimin. The treatments receiving coated DAP in first experiment, coated DAP along with Nimin coated urea in second experiment recorded the higher availability of P than uncoated fertilizers. *(Key words: Coated DAP, Uncoated DAP, Nimin coated urea, Available P)*

Phosphorus is immobile in most soils compared to other major nutrients. A widely studied problem of agricultural soils in arid and semi-arid regions showed that the low P availability was caused by intense calcium phosphate fixation. To avoid this, coating of fertilizer is done.

The P losses from the soil can be controlled through coating of soluble P fertilizer with insoluble materials thereby reducing their solubility and release into the soil and chemically converting the fertilizer into less soluble forms (Saravanan and Kothandaraman, 1984). Similarly, N losses were also reduced while urea was coated with Nimin (Sharma and Agarwal, 1989 and Budhar *et al.* 1991).

It is believed that coated granules can maintain P in the soluble form for a longer period by not allowing the entire soluble P to come in contact with soil constituents, thereby minimising rapid fixation reactions. When P is released in small increment from the coated granules into the soil solution, the plant roots could compete very well with fixation reactions and absorb more P. The present study is aimed to reduce the P fixation by using coated DAP granules and reduce N losses by using Nimin coated urea and to evaluate the optimum level of coating.

Materials and Methods

Two field experiments were conducted to evaluate the efficiency of coated DAP and Nimin coated urea with rice variety ADT 36 and IR 20 respectively. The experimental design adopted was Randomized block design in both the experiments with 9 & 12 treatments and replicated thrice.

The fertilizer dose followed in the first experiment was 120, 38 and 38 Kg ha^{-1} of N, P_2O_5 and K_2O and in second experiment 100, 50 and 50 kg ha^{-1} of N,P_2O_5 and K_2O.

The fertility status of the experimental fields are low in all major nutrients like available N, P and K.

	N (kg ha^{-1})	P (kg ha^{-1})	K (kg ha^{-1})
Experiment 1	152	8.2	50
Experiment 2	174	6.2	132

The soil samples collected at active tillering, panicle initiation, flowering and post-harvest stages were analysed for soil available P.

Treatment Details

First experiment

T_1 Absolute control: No N, P &K

T_2 Recommended N and K only; No P

T_3 Recommended N and K + 38 Kg P_2O_5 / ha as SSP (100 % of recommended P)

T_4 Recommended N and K + 38 Kg P_2O_5 / ha as uncoated DAP

T_5 Recommended N and K + 38 Kg P_2O_5 / ha as coated DAP

T_6 Recommended N and K + 30.4 Kg P_2O_5 / ha as uncoated DAP (80 % of recommended P)

T_7 Recommended N and K + 30.4 Kg P_2O_5 / ha as coated DAP

T_8 Recommended N and K + 22.8 Kg P_2O_5/ ha as uncoated DAP (60 % of recommended P)

T_9 Recommended N and K + 22.8 Kg P_2O_5 / ha as coated DAP

Second experiment

T_1 Absolute control: No N,P &K

T_2 Recommended N and K only; No P

T_3 Recommended N and K +50 kg P_2O_5 / ha as SSP (100 % of reommended P)

T_4 Recommended N and K +50 kg P_2O_5 / ha as uncoated DAP

T_5 Recommended N and K +50 kg P_2O_5 / ha as coated DAP

T_6 Recommended N and K + 40 kg P_2O_5 / ha as uncoated DAP (80 % of recommended P)

T_7 Recommended N and K + 40 kg P_2O_5 / ha as coated DAP

T_8 Recommended N and K +30 kg P_2O_5 / ha as uncoated DAP (60 % of recommended P)

T_9 Recommended N and K +30 kg P_2O_5 / ha as coated DAP

T_{10} Recommended N and K +50 kg P_2O_5 / ha as coated DAP (100 % of recommended P); N as Nimin coated urea

T_{11} Recommended N and K + 40 kg P_2O_5 / ha as coated DAP (80 % of recommended P); N as Nimin coated urea

T_{12} Recommended N and K + 30 kg P_2O_5 / ha as coated DAP (60 % of recommended P) ; N as Nimin coated urea

Results and Discussion

The available P content of the soil varied markedly among the different stages of observation wherein, the soil available P at active tillering stage was the highest (27.86 kg ha^{-1}) in first experiment and 24.33 kg ha^{-1} in second experiment respectively ; it progressively declined with the advancement of crop growth. In first experiment the application of recommended N_1 and 100% of recommerxied P as coated DAP and in second experiment 100% of recommended P as coated DAP along with recommended N as Nimin coated urea registered the highest available P. This was so at all the stages of crop growth. The greater availability of P from coated DAP might be due to its slow release mechanism. Similar result was reported by Mohanty and Kibe (1968).

Among the P sources, coated DAP treatment recorded the highest available P when compared to uncoated DAP and SSP. This might be obviously due to the coating of DAP and urea which ensured slow and steady release of nutrients. This is in accordance with Patil (1996) who reported that coated fertilizers had a higher availability of nutrients due to their slow release nature. The lowest available P in SSP treatment might be due to the fact that the P from SSP could have been dissolved and fixed quickly in the soil when compared to coated and uncoated DAP.

Application of increased levels of P increased the soil available P, which might be due to the increase in, water soluble P in soil, where P fertilizers were applied. Similar results of increased available P with increasing levels of

Table 1. Soil available P as influenced by sources and levels of P and Nimin coated urea in rice (Mean of three replications in kg ha^{-1})

Treatments	Different crop growth stages									
	Active tillering		Panicle initiation		Flowering		Post harvest		Mean	
	Expt. 1	Expt.2	Expt. 1	Expt.2	Expt.1	Expt. 2	Expt. 1	Expt. 2	Expt. 1	Expt. 2
T1	15.93	11.60	14.60	10.10	13.03	9.80	12.93	8.20	14.88	9.92
T2	16.00	12.00	15.00	10.90	14.67	10.20	13.47	8.90	14.78	10.50
T3	35.63	30.60	25-00	20.20	20.23	15.80	17.00	12.20	24.47	19.70
T4	33.30	29.86	31.57	26.04	26.93	24.60	15.60	19.40	26.85	24.73
T5	36.63	32.40	34.00	28.86	30.04	28.00	23.77	21.78	31.40	27.76
T6	29.40	24.20	27.20	21.20	24.47	19.40	17.43	15.73	24.63	20.13
T7	31.30	26.06	30.93	23.40	29.13	20.80	20.80	16.90	28.04	21.79
T8	25.:53	19.00	22.57	17.80	19.53	16.30	15.53	11.20	20.29	16.07
T9	28.97	21.80	27.77	20.00	25.20	18.10	16.27	12.90	24.55	18.20
T10	—	33.40	—	31.20	—	28.30	—	20.40	—	28:32
T11	—	29.80	—	22.40	—	19.80	—	17.63	—	22.40
T12	—	23.20	—	20.20	—	18.40	—	16.60	—	19.60
Mean	27.86	24.33	25.83	21.11	22.62	19.12	16.98	15.17	23.30	19.96

	Experiment 1		Experiment 2	
	SE_d	CD (0.05)	SE_d	CD (0.05)
Treatment (T)	1.2	2.39	0.54	1.08
Stages (S)	0.8	1.59	0.31	0.62
T x S	2.32	4.63	1.08	2.14

added P was reported by Singaram (1988). The available P was lowest at absolute and P control treatments.

The progressive decrease in available P with advancement of the stages, at all the treatments might be attributed to the uptake by crop and also as a result of prolonged period of reaction of added P with soil which might be responsible for the reversion of the available P into unavailable form of P (Singaram, 1988).

References

Budhar, M.N., Ramasamy, C. and Kareem, A.R. (1991). Relative efficiency of coated N fertilizers in low land rice. *Indian J. Agron.* **36**: 124-125.

Mohanty, S. K, and Kibe, M. M. (1968). Behaviour of coated and uncoated fertilizer under field conditions. *Oryza*, **5**: 1-3.

Patil, N.T. (1996). Effect of sources, doses and coating of P fertilizer on P availability and yield of transplanted rice under lateritic soils of Konkan Thesis M.Sc. (Ag.) K.K.V, Dapoli.

Saravanan,A. and Kothandaraman, G.V. (1984). Efficiency of P fertilizers as determined by IR 20 grain yield. *Int. Rice. Res. Nowsl.* **9**: 22

Sharma,B. M, and Agarwal, S.K. (1989). Relative efficiency of N fertilizers in rice. *Indian J. Agron.* **34**: 101-102.

Singaram,P. (1988). Evaluation of phosphorus sources for a cereal based cropping sequence. Ph.D. Thesis, TNAU, Coimbatore.

(Received : April 2000; Revised : August 2001)

Madras Agric. J. 88(7-9): 406-409 July-September 2001

Growth and yield of rice fallow green gram as influenced by methods of sowing, stubble management and nutrient application in Tambiraparani command area

B.J. PANDIAN, S. ANAND KUMAR, V. VEERABADRAN AND V.K RAVICHANDRAN
Department of Agronomy, Agricultural College and Research Institute, Killikulam - 628 252, Tamil Nadu.

Abstract : The influence of various methods of sowing, stubble management and nutrient application for rice fallow green gram has been studied at Agricultural College and Research Institute farm Killikulam during 1998-99. The treatment consisting of dibbling green gram seeds as rice fallow in rice stubbles immediately after the harvest of the rice with stubbles cut and mulched over soil along with basal N and P application @ 12.5:25 kg ha^{-1} and two per cent DAP spray twice produced higher green gram yield of 691 kg ha^{-1} which accounts 165 per cent increased yield over conventional method of raising rice fallow pulses. *(Key words: Rice fallow, Sowing methods, Stubble, Foliar spray)*

Cultivation of pulses under rice fallows as a relay cropping is an unique system in coastal and deltaic areas of India (Satyanarayana, 1998). The rice fallow pulses survive entirely on residual moisture and fertility left over by the preceding crop of rice. Rice fallow cultivation does not permit agronomic manipulations such as tillage, herbicide application and irrigation etc Under Tamil Nadu condition rice is being cultivated in nearly 18 lakh ha; of which Cauvery and Tambiraparani command accounts 7 lakh ha which is ideally suited for rice fallow cultivation. Barring seed material, farmers follow almost zero input cultivation under rice fallow pulses. Hence the productivity of rice fallow pulses is always far below than the normal. It is highly imperative to develop improved agro-techniques to exploit the yield potential of pulses under rice fallow condition.