VARIETAL RESPONSE TO NITROGEN TOP DRESSING IN HALF BOG SOIL IN THE LOW COUNTRY WET ZONE.

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In the low country wet zone fertilizer use for rice crop depends upon the soil factors, type of varieties (ie. local or improved and economic status of the farmers. Adoption of new improved high yielding rice varieties by the majority of farmers in the region has resulted in greater attention of farmers to increase their rice yields. New improved rice varieties, when given the correct fertilizer dose and proper crop sanitation give higher yields than the local rice varieties receiving identifical best management.

A problem regarding (the optimum dose of) urea to be applied for short aged improved rice varieties under half bog soil conditions was entrusted to the research division at R.T.W.G. meeting. Accordingly, an investigation was carried out in farmers fields by the Adaptive Research Division of R.A.R.S. Bombuwela in yala 1986 and maha 1986/87 to determine whether the additional dose of urea application is beneficial.

In order to gather more information from this study, two more applications in addition to the proposed level of urea application were included.

Materials and Methods.

The site was located in a half bog soil tract in Galle district. Results of the chemical analysis of the soil from this location are given in Table 1.

The crop was established by broadcasting 85% sprouted seed. Seed rate was 100 kg/ha. The varieties used were Bw 272-3 and Bg 34-8 with three replications. Experimental plots were 3m x 3m, separated by 30 cm bunds to prevent fertilizer movement from one plot to the next. Each plot was provided with separate inlet and outlet for irrigation and drainage.

Application of agrochemicals for weed, pest and disease control were as recommended by Department of Agriculture. Fertilizer aplication was done according to the treatments mentioned below. All the field operations from broadcasting to crop maturity were done by the farmers under supervision of research staff.

Fertilizer treatament

T_1 - Current fertilizer recommendation for short age varietal group under half bog Soil condition (no urea application; as top dressing)

T_2 - Extra dose of urea applied at 3 weeks after sowing in additio;n to T_1 (proposed application).

T_3 - Split application of the amount of urea used in T_2 at 3 and 5 weeks after sowing.

T_4 - Double the amount of urea used in T_3 at 3 and 5 weeks after sowing.

All the treatments received equal amounts of Basal (5:15:15:) and TDM fertilizer. Fertilizer application to each of the treatments are presented gms/plot Table 2 and equivalent amount per hectare is given in kg within brackets.

At harvesting, a 30 cm border was left to remove the border effect. Hence an area of 2.4m x2.4m was harvested to evaluate yields. Plot yields were measured in kg and subsequently converted into mt/ha at 14% moisture content.

Yield date obtained from yala 1986 and maha 1986/87 were analysed as 2 x 4 factorial R.C.B. design. According to the test of homogenity of error, mean squares of the analysis of variance for both yala and maha seasons were completed. Combined analysis were done to test the significance of the treatments and the interactions.

Results and Discussion

General Observations

Growth performance of both Bw 272-3 and Bg 34-8 seemed to be better in the plots receiving additional

dose of urea (as a top dressing) compared to the current recommendation of no urea application as a top dressing. In addition., dark greenish leaves and slight differences in plant height were observed in both varieties under same treatment. However, lodging was observed in Bw 272-3 and Bg 34-8 which ranged from 25% to 15% respectively in the treatment and where higher does of urea (ie. T_4) was applied. Lodging was slightly higher in Bw.272-3 than that of Bg 34-8.

Yield performance

Mean yield of different treatments (in mt/ha) for both yala and maha are presented in Table 3.

According to the individual analysis of variance for both seasons, treatments were found to be significant. Regardless of urea applications, Bg.34-8 performed significantly better than Bw.272-2 in half bog soils. Regardless of the varieties, application of extra dose of urea in comparison to the current recommendation were found to be superior in significantly the grain yield. However, there were no significant yield increase between any of the other urea application treatments. Furthermore, interactions between the variety and urea application were found to be not statistically significant so that similar response could be found in both varieties under half bog soil condition (see table 5 and 6). The results from both seasons were found to be similar.

According to the combined analysis (computed F value of larger error mean square/smaller error mean square is 2.08. This value is smaller than the corresponding tabular F value of 2.48 with f1 = f2 = 14, of at 5% level of significance) similar results were obtained (see table 8)

In the combined analysis, results showeds that regardless of urea application and variety, yield difference due to seasonal effect of yala and maha was found to be significant (see table 7) However, this seasonal variation has not interacted with urea application and variety as the two and three way interactions were found to be not significant - (see table 7). Therefore , due to non significant interaction effect, findings

of this study could be generalized in order to generate blanket recommendation for half bog soils in the low country wet zone.

Table 1. Chemical analysis of the soil sample collected from the experimental site at Keradewela in Galle district.

Soil characteristics	Value.
Organic matter %	27.00
pa	4.10
Total nitrogen %	0.92
Electrical conductivity (Milimhos/cm)	0.24
Phosphorus (ppm)	24.50
Exchangable k (Mili eq/100mg)	0.28

Table 2 Fertilizer application in gram/per based on the treatments mentioned in this experiment.

Treatment.	Time and amount of application.			
	Basal at sowing gms/plot	Urea 3 weeks after sowing gms/plot	Urea 5 weeks after sowing gms/plot.	TDM 7 Wks after sowing. gms/plot
T_1	230.0 (240.0)	-	-	85.5 (90.5)
T_2	230.0 (240.0)	28.5 (30.25)	-	85.5 (90.5)
T_3	230.0 (240.0)	14.25 (15.0)	14.25 (15.0)	85.5 (90.5)
T_4	230.0 (240.0)	28.5 (30.25)	28.5 (30.25)	85.5 (90.5)

(Equalent value in kg/ha are given within brackets)

Table 3 Mean grain yields under different treatments for yala 1986 and Maha 1986/87 (Tons/ha). Average of three replications.

Treatment	Mean yield * yala 1986 (tons/ha).	Mean Yield * Maha 1986/87 (tons/ha)
V1T1	1.86	2.78
V1T2	2.66	3.68
V1T3	2.57	3.58
V1T4	2.41	3.61
v2t1	2.51	3.41
V2T2	2.57	4.49
V2T3	2.86	3.99
V2T4	2.64	3.82

V1 - Bw 272-3
V2 - Bg 34-8

Table 7. Combined analysis of varieance over two crops seasons based on 2 x 4 factorial R.C.B design with three replications.

Source	df	ss	ms	
Rep. within season	04	0.323	0.080	ns
Treatment	15	22.733	1.515	**
Urea app	03	3.474	1.158	**
Variety	01	1.861	1.861	**
Season	01	15.974	15.974	**
Var x Urea app	03	0.271	0.090	ns
Urea app.x sea	03	0.492	0.164	ns
Var. x Sea.	01	0.198	0.198	ns
Var x Urea x Sea	03	0.463	0.154	ns
Pooled error	28	5.444	0.194	
Total	47	51.233		

* - Significant at 1% probability level.

Table 4. Individual analysis of variance (2 x 4 factorial R.C.B). for fertilizer trial with 3 replications.

Source	df	ss	ms	
	Yala 1986			
Replication	02	0.250	0.125	ns
Treatment	07	1.726	0.247	
Variety	01	0.425	0.425	*
Urea app.	03	0.914	0.305	*
Var.x Urea app	03	0.387	0.129	ns
Error	14	1.120	0.080	
	Maha 1986/87			
Replication	02	3.055	1.527	ns
Treatment	07	5.026	0.718	**
Variety	01	1.639	1.639	*
Urea app.	03	2.095	0.698	**
Var.x Urea app.	03	0.292	0.097	ns
Error	14	2.339	0.167	

CV% (1986/87 Maha) - 11.15

CV% (1986 yala) - 10.52

**-significant at 1% probability level

* - " " 5% " "

Table 5 Variety X urea application table for mean yield computed from data in Table 3 - yala 1986. (in tons/h).

Urea app / Var.	T1 T/ha	T2 T/ha	T3 T/ha	T4 T/ha	Var. mean T/ha
V1 (Bw 272-3)	1.88	2.66	2.57	2.41	2.38
V2 (Bg 34-8)	2.51	2.57	2.86	2.61	2.65
Urea app mean	2.19	2.62	2.72	2.52	-

For urea application: LSD (0.05) - 0.35 mt/ha

For variety: LSD (0.05) - 0.24 mt/ha

Table 6 Variety X urea application table for mean yield computed from data in table 3 - Maha 1986/87 (in tons/ha)

	Urea app	T1 T/ha	T2 t/ha	T3 t/ha	T4 t/ha	Mean var. t/ha
V1	(Bw 272-3)	2.78	3.68	3.61	3.41	3.40
V2	Bg 34-8)	3.41	4.49	3.99	3.82	3.92
	Urea app mean	3.09	4.08	3.78	3.71	-

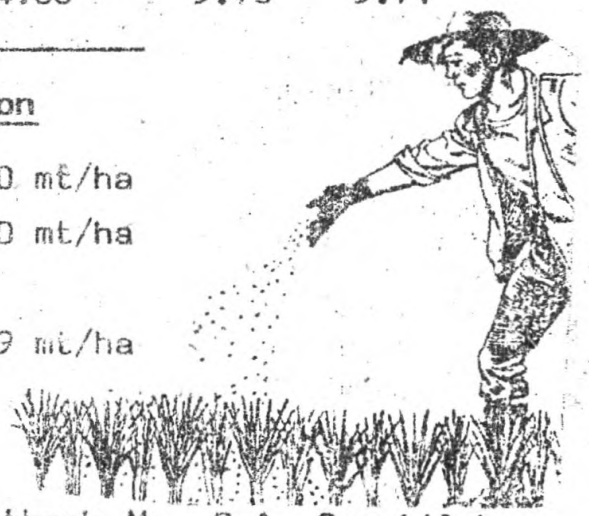
For urea application

LSD (0.05) - 0.50 mt/ha

(0.01) - 0.70 mt/ha

For variety

LSD (0.01) - 0.49 mt/ha



ACKNOWLEDGEMENTS

The author wish to thank Mr. G.A. Gunatilake, D.D.(R), Bombuwela for giving the opportunity to conduct this investigation in farmers' fields. The assistance given by Mr. Micheal Silva, R.O.I.C. Labuduwa and the field staff is acknowledged with thanks.

The author is also greatful to the soil chemist Division of Soil Chemistry, C.A.R.I., Gannoruwa who helped to analyse the soil samples.