which has already been reported by Kaliappan *et al.* (1967 and 1968). The results are in confirmation with previous findings wherein decreased yields due to salinity treatments have been reported in the case of rice (Ehrencron 1965).

Summary and Conclusion: From a pot culture experiment conducted during the three years to study the effect of salinity and yield of three varieties of ragi, the following conclusions were drawn. (i) It was found that yield significantly decreased under saline conditions. The adverse effect of salinity was found to be very severe when the salt concentration was more than 4000 ppm. (ii) The ragi variety ECW 840 was more susceptible to salinity than the varieties CO 7 and CO 8. (iii) The magnitude of decrease in yield for various levels of saline treatments varied between the varieties.

REFERENCES

Balasubramani, V. 1965. Effect of salinity on certain physiological factors in rice (*Oryza sativa* L.) M. Sc. (Ag.) Thesis Univ. Madras (Unpub)

Desai, A. D. and T. S. Rao. 1957. Effect of saline waters on growth and yield of rice. *J. Indian Soc. Soil. Sci.*, 5 : 13–16.

Ehrencron, V. K. R. 1965. Salt tolerance of rice soils and Ferti. *Abst*, 29 : 1366–1966.

Kaddah, M. T. and S. I. Fakhry. 1961. Tolerance of Egyptian Rice to salt: 1 Salinity effects when applied continuously and intermittently at different stages of growth after transplantation. *Soil Sci.*, 91 (2) : 112–20.

Kaliappan, R., M. Ramachandran and A. Rajagopal. 1967. Effect of salinity on the South Indian Field crops: Germination and early vigour of Ragi (*Eleusin coracana* Gaertn.) *Madras agric. J.*, 54 : (12) : 619–23.

——— and A. Rajagopal. 1968. Effect of salinity on the South Indian Field Crops – Duration and grain setting in Ragi (*Eleusine coracana* Gaertn.) *Madras agri. J.*, 55 (3) : 125–28.

Narasimba Rao and Murty. 1963. Physiology of salt tolerance. *Agr. Res*, 3 : 103.

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Influence of Major Nutrients on *Eleucine corocana* (*Ragi*)-Yield Attributes*

by

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Introduction: The plant height, number of ear bearing tillers, number of fingers and straw yield have close relation with the ultimate grain yield of *ragi* (*Eleucine coracana*). These yield atributes inturn are influenced by the application of major nutrients. In this paper the influence of sources and levels of nitrogen with phosphorus and potassium on the yeild altributes of *ragi* CO 7 are discussed.

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Materials and Methods: A trial with split plot design laid out on a calcareous black soil of Central Farm, Coimbatore during July-October 1968, to study the effects of three sources of nitrogen (ammonium sulphate, calcium ammonium nitrate and urea) each at three levels besides the control (0 60, 120 and 180 Kg N/ha), three levels of phosphorus (0.35, 70 kg P_2O_5/ha) and two levels of Potassium (0,35 Kg K_2O/ha) on CO 7 *ragi*. Five plants from each plot, representing 1% of the population, were selected at random from the net area for studying the plant characters. The height of the plant and the number of ear bearing tillers were recorded, on the sixtieth day after planting. With the sample plants after harvest the main culm was chosen to record the length of the ear head and the number of fingers. Correlation to yield has also been worked out.

Results and Discussion: 1) *Plant height on the 60th day:* Significant increase in plant height was registered by the treatments N180 and N60; however, even though the 120 Kg nitrogen level recorded an increase in plant height it failed to reach the level of significance (Table 1).

TABLE 1. *Comparison of levels of N with control on plant height*

Levels of N kg/ha	Mean height in cm	SED	CD
N 0	65.32	0.943	2.811
N 60	68.22	—	—
N 120	67.33	—	—
N 180	68.66	—	—

Conclusion: N 180 N 60 N 120 N 0

Though on the face of it, this appears to introduce an element of contradiction still the uniformity of trend is patent in that the N120 treatment has recorded a clear 2.1 cm increase in plant height over that for No.

The increase in plant height due to the application of nitrogen is in agreement with the results of Chavan and Shendge (1955), Narasimhamoorthy *et al.* (1960), Karunakara Shetty (1961) and Ranganathan (1962) who reported similar increase in *ragi*. Further it has been well established that nitrogen increases vegetative growth in most crops. However, Kolandaiswamy (1964) reported a lack of response to added nitrogen on *ragi*.

The sources of nitrogen, levels of phosphorus and levels of potassium did not influence the plant height. Phosphorus and potassium do not evoke spectacular growth increase as nitrogen does, especialy under conditions of normal availability of these two elements. Ramakrishna Nair (1963) also reported lack of response to phosphorus and potassium application in *ragi*.

Interaction between nitrogen and phosphorus, at the highest levels for both (N180, P70) was noticed. Evidently this is a case of increased metabolism resulting through the complementary action of these two nutrients.

(2) *Number of ear bearing tillers as on the 60th day;* Added nitrogen increased the number of ear bearing tillers (Table 2).

TABLE 2. *Levels of N on ear bearing tillers*

Levels of N kg/ha	Mean number	SED	CD
0	4.86	0.198	0.392
60	5.28		
120	5 14		
180	5.36		

Conclusion: N180 N60 N120 N0

Ranganathan (1962) and Kolandaiswamy (1964) also reported significant increase in productive tillers with increasing levels of nitrogen on *ragi*.

The sources of nitrogen, levels of phosphorus and levels of potassium individually did not evoke any response in the number of productive tillers. Ramakrishna Nair (1963) reported the absence of any response to the application of phosphorus and potassium. As per the observations of Gardner (1942) tillering is largely varietal in nature and is also related to organic nutrition and environmental conditions such as light, competition for nutrients between plants, soil moisture etc.

3. *Number of fingers;* Neither the levels of nitrogen nor the sources of nitrogen had influenced the number of fingers per panicle. The results further reveal that phosphorus, potassium and their interaction with nitrogen had shown a lack of response on the number of fingers.

4. *Mean length of main ear head:* The levels and sources of nitrogen, levels of phosphorus and potassium did not exert any influence on this character. The findings are in agreement with those of the earlier workers, who reported that the length of ear head is not influenced by fertilisation (Samathuvam 1962, Kolandaiswamy 1964).

Straw yield; The three levels of added nitrogen favourably influenced the yield of straw when compared to the control. However, there was no difference between the levels of added nitrogen. (Table 3).

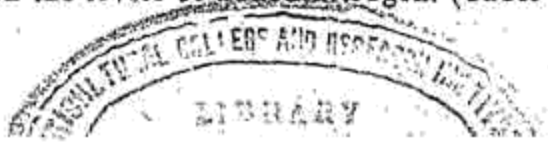

TABLE 3. *Effect of N on straw yield (Plot yield in kg)*

Levels of N kg/ha	Yield	SED	CD
0	13.277	0.846	1.779
60	16.440		
120	17.041		
180	17.141		

Conclusion. N 180 N 120 N 60 N 0

Karunakara Shetty (1961) and Ranganathan (1962) observed a similar increase with increasing levels of nitrogen. The increase is evidently a reflection of the trend observed under plant height and productive tillers as on 60th day. It thus implies that the earlier advantage gained in vegetative growth is maintained till harvest.

Neither phosphorus nor pottasium influenced the straw yield. Ramakrishna Nair (1963) reported the failure of phosphorus and potassium to confer any beneficial effect on *ragi*.

Correlation studies: The relations between the yield of grain and plant height, number of fingers, yield of straw and number of ear bearing tillers were studied and the results are presented in Table 4.

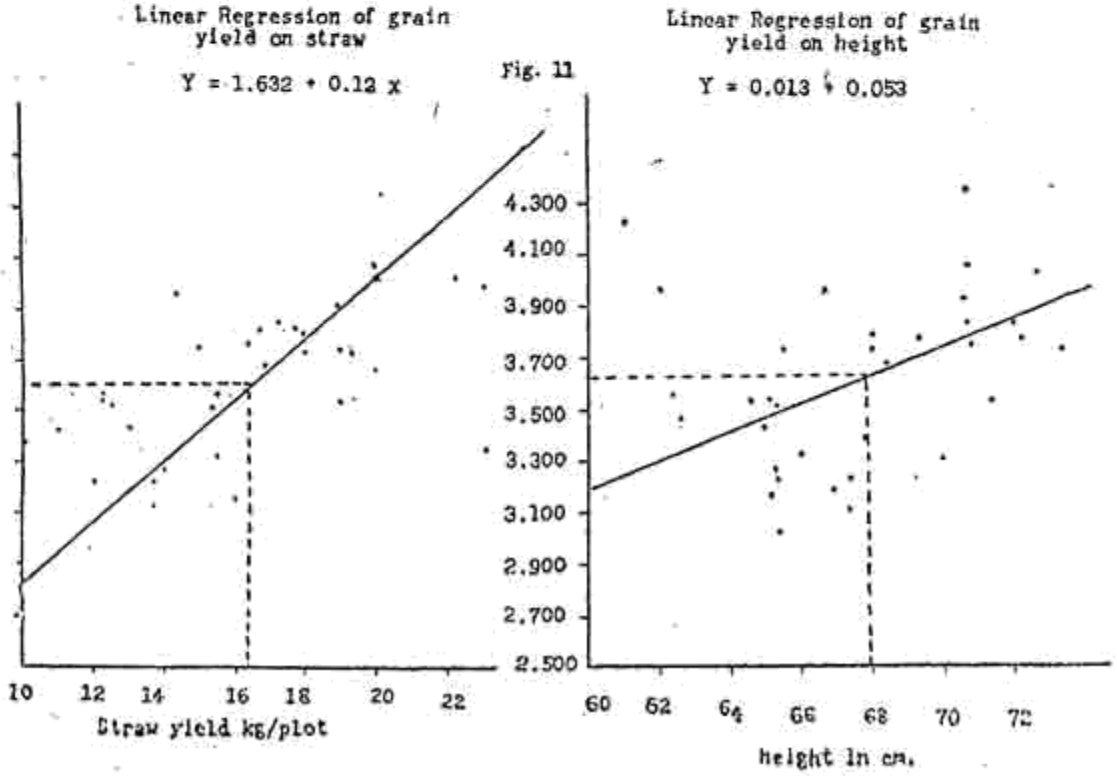

Fig. 11

TABLE 4. *Relationship of yield of grain and other characters*

Relationship	Correlation Co-efficient (Y)	Regression
Yield of grain with plant height on the 60th day	0.500**	Y=0.013+0.053X
Yield of grains Vs. Number of fingers	0.170	
Yield of grains Vs. Yield of straw	0.746**	Y=1.632+0.12 X
Yield of grains Vs Number of ear bearing tillers	0.082	

** Significant at P=0.001 level

Plant height on the 60th day and yield of straw had significant correlation with the grain yield. Mahadevappa and Ponnaiya (1962) while working out a selection index for *ragi* observed weight of straw, number of tillers height of plant and number of fingers to have positive correlation with that of yield in the case of incurved varieties. They also observed straw weight to have maximum correlation with the yield, which is in agreement with the present study.

Summary: From an experiment to study the influence of the three major nutrients on ragi conducted at the Agricultural College, Coimbatore during 1968 the following conclusion on yield attributes were recorded.

The plant height, the number of ear bearing tillers on the sixtieth day and the straw yield were increased significantly by the levels of N; where as sources of N, levels of P and K did not influence these characters. The levels and sources of N, levels of P and K did not evoke any response on the length of the panicle and number of fingers.

Plant height on the 60th day and straw yield had significant correlation with grain yield.

REFERENCES

Chavan, V. M. and P. Y. Shendge. 1955. Intensive cropping on *Nagli* in Bombay State. *Poona Agrl. College Magazine*, 46 : 180-82.

Gardener JL. 1942. Studies on tillering. *Ecology*, 23 : 162-75.

Karunakara Shetty, B. 1961. Studies on the effect of graded doses of nitrogen on the yield potentials of popular ragi strains of the Madras State. M. Sc (Ag) Dissertation Univ. Madras (Unpub.)

Kolandaiswamy, S. 1964. Effect of spacing and split doses of Nitrogen on CO 7 *ragi* M. Sc. (Ag.) Dissertation Univ. Madras (Unpub.)

Mahadevappa and B. W. X. Ponnaiya. 1962. Selection index for yield in *ragi*. *Madras agric. J.*, 50 : 85.

Narasimhamoorthy, V. Rama Rao and Sasibushan. 1960. Manuring of peddanta ragi. *Andhra agric. J.*, 7 : 212-16.

Ramakrishna Nair, K. 1963. response of CO 7 *ragi* to phosphorus and Potash. M. Sc. (Ag.) Dissertation Univ. Madras (Unpub.)

Ranganathan, A. K. 1962. Influence of spacing and manuring on the yield of irrigated *ragi* Dissertation Univ. Madras (Unpub.)

Samathuvam, K. 1962. Studies on relationship between grain yield and tillering sequence. *Madras agric. J.*, 49 : 224.