The available literature (Bilgrami *et al.*, 1981) indicate that *Alternaria radicina* and *A. tenuissima* are being reported for the first time from India.

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INFLUENCE OF BLUE GREEN ALGAE ON GROWTH, YIELD COMPONENTS AND ECONOMY IN LOW LAND RICE

S. JEYARAMAN

Department of Agronomy, Agricultural College and Research Institute, Madurai-625 104

ABSTRACT

Studies on the effect of soil application of a composite culture inoculum of blue green algae on N economy in low land rice indicated that application of 75 kg N per ha along with soil application of composite culture of blue green algae at 10 kg per ha at 10th day after transplanting recorded higher grain yield. It was found significantly superior over the application of 75 kg N per ha alone and statistically

on par with the application of recommended level of 100 kg N per ha. Thus, the blue green algae inoculation paved a way of saving of 25 per cent recommended level of fertilizer N in lowland rice.

KEY WORDS: Blue green algae, Rice, N economy

In submerged soil system, biological nitrogen fixation through blue green algae contributes 25 to 30 kg N per ha for one cropping season (Venkataraman, 1972). A composite culture of blue green algae was reported to be more effective than single culture inoculation. The positive response of rice to blue green algae inoculation was also reported by Jaganathan and Kannaiyan (1977) and Venkataraman (1981).

MATERIALS AND METHODS

Withe the objective of studying the yield response of rice to soil application of a composite culture of blue green algae along with sub-optimal levels of N, the field experiments were conducted during Kharif and Rabi seasons of 1985-86 in the soils of Agricultural College and Research Institute, Madurai. The soil type was sandy loam in texture with low in available N (224.2 kg/ha), medium in P_2O_5 (14.6 kg/ha) and high in K_2O (274.8 kg/ha). The EC and pH values of the soil were 7.1 and 0.33 m mhos/cm respectively. A composite culture inoculum of blue green algae used contained nine potential nitrogen fixing *viz.* Nostoc, Anabaena, Aulosira, Tolypothrix, Aphanothece, Cylindrospermum, Plectonema, Oscillatoria and Microcoleus. It was obtained from Tamil Nadu Rice Research Institute, Aduthurai.

The rice varieties Co 37 and IR 20 were used as test varieties for kharif and rabi respectively. The treatments comprised of recommended level of N (100 kg N/ha) and three sub-optimal levels of N (O, 50, 75 kg N/ha) with and without application of a composite culture of blue green algae at 10 kg/ha. The treatments were replicated thrice in a randomised block design in plots of 27 m^2 size. Fifty kg of each P_2O_5 and K_2O/ha and half of N as per treatments were applied basally at the time of planting and the remaining half was top dressed in two equal splits at 30th and 45th days after planting. No organic manure was supplied to the crop. The composite culture of blue green algae was applied at 10th day after planting.

The biometric observations such as plant height, total number of tillers/hill, number of productive tillers/hill, number of filled grains/panicle, length of panicle, 1000 grains weight and yield of grain and straw were recorded.

RESULTS AND DISCUSSION

From the experimental results of both kharif and rabi seasons (Table 1), it was observed that the growth characters such as plant height and total number of tillers per hill were found to be maximum in treatment receiving 75 kg N/ha along with blue green algae inoculation (T_4) and it was on par with the treatment of N alone at 100 kg/ha (T_1). Blue green algae inoculation alone (T_6) had a significant influence in plant height and total number of tillers per hill as compared to control (T_7). This increase in plant height and total number of tillers may be partially due to synthesis and excretion of growth promoting substances by blue green algae besides nitrogen fixing activity (Kannaiyan, 1985).

Table 1. Effect of blue gree algae on growth characters and yield components.

	Growth characters						Yield components					
	Plant height (cm)		Total tillers per hill		Number of productive tillers per panicle		Length of panicle (cm)		Filled grains per panicle		1000 grains weight (g)	
	Kharif Co37	Rabi IR20	Kharif Co37	Rabi IR20	Kharif Co37	Rabi IR20	Kharif Co37	Rabi IR20	Kharif Co37	Rabi IR20	Kharif Co37	Rabi IR20
T_1 – 100 kg N/ha alone	89.70	94.70	12.27	10.13	9.40	8.00	20.83	22.13	102.87	100.53	10.60	19.40
T_2 – 75 kg N/ha alone	85.00	87.50	10.47	8.67	8.93	6.47	20.07	21.07	98.07	94.80	20.03	18.93
T_3 – 50 kg N/ha alone	79.30	82.90	9.47	6.67	8.07	5.33	19.40	20.07	89.33	90.13	19.93	18.40
T_4 – 75 kg N/ha + BGA	91.00	95.50	12.73	10.40	10.73	8.87	20.93	22.20	104.73	101.50	20.68	19.60
T_5 – 50 kg N/ha + BGA	80.70	86.10	9.73	7.67	8.33	6.60	19.60	21.27	94.80	96.07	20.27	18.67
T_6 – BGA alone	75.10	76.70	7.67	6.67	6.53	5.07	18.80	19.27	83.53	86.00	20.37	17.73
T_7 – Control	69.10	68.10	6.53	5.40	5.73	4.20	18.07	18.40	73.80	76.93	19.06	16.73
SE_D ±	1.46	2.82	1.14	0.40	0.66	0.46	0.61	0.79	3.80	2.94	0.30	0.83
CD (0.05)	3.20	6.16	2.50	0.87	1.44	1.01	1.34	1.73	8.30	5.97	0.66	1.81

Among all the treatments, that with 75 kg N/ha along with the blue green algae inoculation (T_4) had given more number of productive tillers, more filled grains, higher panicle length and better test grain weight. This increase in yield components was statistically on par with treatment receiving N alone at 100 kg/ha (T_1). Blue green algae inoculation alone (T_6) recorded significantly more number of productive tillers, more filled grains, higher panicle length and test grain weight over absolute control (T_7). This increase in yield components was possible because the atmospheric nitrogen fixed by blue green algae was made available to the rice crop throughout the crop period.

The grain and straw yields are furnished in Table 2. The treatment of 75 kg N/ha along with blue green algae inoculation (T_4) recorded maximum grain and straw yield followed by those with 100 kg N/ha alone (T_1). T_4 had a significant influence in grain and straw yield over the treatment with 75 kg N/ha alone (T_3). Blue green algae inoculation alone (T_6) recorded significantly higher grain and straw yield over absolute control (T_7). The increase in yield was due to more number of productive tillers, more filled grains, higher panicle length and test grain weight. The higher straw yield was only due to the increase in plant height and total number of tillers per hill by blue green algae.

TABLE 2
Effect of Blue green algae on grain and straw yield

Treatments	Grain yield (Kg/ha)			Straw yield (Kg/ha)		
	Kharif Co 37	Rabi IR 20	Mean	Kharif Co 37	Rabi IR 20	Mean
T_1-100 Kg N/ha alone	5926	4253	5090	8962	5538	7250
T_2-75 Kg N/ha alone	5679	3993	4836	8567	5391	6879
T_3-50 Kg N/ha alone	5000	3802	4401	8246	4984	6597
T_4-75 Kg N/ha + BGA	6234	4479	5357	9037	5816	7427
T_5-50 Kg N/ha + BGA	5555	4045	4800	8580	5260	6920
T_6- BGA alone	4815	3264	4040	7234	4236	5735
T_7- Control	4136	2799	3468	6270	3441	4906
SED	215	188	-	288	199	-
CD (0.05)	468	410	-	497	434	-

Thus the inoculation of blue green algae along with 75 kg N/ha recorded more grain yield as compared to application of 100 kg N/ha. The soil application of blue green algae had supplemented the fertilizer N to the rice crop which in turn brought about a saving of 25 per cent of recommended N.

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VARIBILITY, CORRELATION AND PATH ANALYSIS OF YIELD AND FIBRE TRAITS IN UPLAND COTTON

K.V. KRISHNARAO[1] AND T.N. MARY[2]

ABSTRACT

A study conducted with 55 genotypes of upland cotton (**Gossypium hirsutum** L.) indicated that the genetic variability was high for boll number, boll weight, lint index and seed cotton yield. Selection based on boll weight and boll number is most advantageous because of high heritability associated with greater genetic advance. Correlation studies indicated the existence of positive associations of seed cotton yield with all traits studied except fibre length and suggested that increase in any one of them will lead to increased seed cotton yield and all of them can be improved simultaneously. Among the components there were no negative correlations except for micronaire with fibre length. Path analysis revealed that boll number and boll weight were the principle yield attributes having high direct effects. The traits seeds per boll, seed index and lint index contributed to yield indirectly through boll weight. The direct effects of other yield and fibre traits on yield were of minor significance.

KEY WORDS: Cotton, Genetic variability, correlation, Path analysis.

Crop improvement depends upon the magnitude of genetic variability present in base population. The heritable component of variation can be measured and expressed with the help of suitable genetic parameters such as coefficient of genetic variation, heritability and genetic advance. For an effective breeding programme, it is essential to have some information on the association between the different yield components and their relative contributions to yield. The interrelationships among the yield components can be analysed with the help of path coefficient analysis which permits the separation of the correlation coefficient into direct and indirect effects. This study provides information on variability, character association and path analysis of yield with quantitative traits in upland cotton.

MATERIALS AND METHODS

Ten divergent varieties of upland cotton were crossed in diallel fashion

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1. Asst. Research Officer, Agricultural Research Station, Madhira, Khammam District, A.P.
2. Reader, Department of Botany, Nagarjuna University.