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Effect of *Azotobacter* in Summer Irrigated Cotton

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Field experiments were conducted during summer 1975 and 1976, to study the efficacy of *Azotobacter* on summer irrigated cotton (Var. MCU. 8). The study revealed that application of *Azotobacter* either to seed or soil was superior to no treatment. Treating cotton seeds with *Azotobacter* and broadcasting and mixing the culture in the soil before sowing at 75 per cent recommended dose of 'N' was the most beneficial treatment, since the requirement of nitrogen to cotton crop was reduced by 25 per cent with increased seed cotton yield.

Field experiments with *Azotobacter* treatment showed significant increase in yield of wheat, oats, barley, maize, sugarbeet and potato (Goswami, 1976). Nutman (1964) obtained 28 to 40 per-cent increase in the yield of field crops treated with *Azotobacter* along with nitrogenous fertilizers. Obliswamy *et al.* (1976) reported upto 8 per cent increase in yield of sunflower, by *Azotobacter* treatment in combination with 45 kg N/ha.

MATERIALS AND METHODS

Field experiments were conducted in Cotton Research Station, Srivilliputhur with MCU 8 under irrigated conditions during summer 1975 and 1976 to study the effect of *Azotobacter* with N levels, under split plot design replicated twice. The main plot treatments comprised no N (N_0), 25 N (N_1), 50 (N_2), 75 (N_3) and 100 per cent of recommended dose of N (N_4). The sub-plot treatments, comprised of no *Azotobacter* (S_1), seed treatment with *Azotobacter* (S_2), broadcasting of *Azotobacter* before sowing and mixing in soil (S_3) and both seed treatment as well as broadcasting of *Azotobacter* and mixing in the soil (S_4).

The first and second year crops were sown on 13th March, '75 and 15th January '76 and harvested during July, '75 and June '76 respectively. The soil was clayey loam. Biometric observations on the yield attributes and the yield of seed cotton were recorded.

RESULTS AND DISCUSSION

The results on the seed cotton yield are presented in Table.

The different treatments during 1975, did not influence the seed cotton yield, however, numerically higher yield was recorded under 75 per cent nitrogen with seed treatment and broadcasting of *Azotobacter*. During 1976, the

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TABLE. Effect of *Azotobacter* on Cotton

Treatment	Yield of seed cotton kg/ha	S. E.	C. D. (P=0.05)
A. Main plot			
No nitrogen (N_0)	1166	38.89	152.22
25% recommended nitrogen (N_1)	1428		
50% recommended nitrogen (N_2)	1148		
75% recommended nitrogen (N_3)	1538		
100% recommended nitrogen (N_4)	1357		
B. Sub plot			
No *Azotobacter* (S_1)	1143	86.67	261.11
Seed treatment with *Azotobacter* (S_2)	1426		
Broadcasting of *Azotobacter* before sowing and mixing in soil (S_3)	1288		
As in S_2 and S_3 - (S_4)	1562		
C. Main plot x sub plot at a given main plot		194.44	585.55

Main plot	Sub plot			
	S_1	S_2	S_3	S_4
N_0	1080	1089	1339	1150
N_1	1387	1617	1333	1376
N_2	987	1381	1298	1483
N_3	783	1789	1133	2444
N_4	1478	1253	1137	1359

plant height at flowering stage was influenced by the nitrogen and *Azotobacter* treatments independently, but the interaction was not significant. Treating the seeds and broadcasting *Azotobacter* as well as 75 per cent N treatment recorded increased plant height at flowering than the other treatments. The number of fruiting points produced were influenced by the *Azotobacter* treatments, but nitrogen levels had no effect. The maximum number of fruiting points were recorded with application of 75 per cent N and seed treatment plus broadcasting of *Azotobacter* which was significantly superior to the other treatments. The number of bolls per plant was not influenced by N, whereas *Azotobacter* treatments influenced them significantly. The highest number of bolls

was registered by seed treatment plus broadcasting of *Azotobacter*.

The seed cotton yield was influenced by N, *Azotobacter* treatments and by their interaction. Application of 75 per cent of N recorded the highest seed cotton yield (1538 kg/ha) among the N levels. Among the *Azotobacter* treatments, the maximum seed cotton yield (1562 kg/ha) was registered by seed treatment plus broadcasting of *Azotobacter*. The maximum seed cotton yield (2444 kg/ha) was recorded by the interaction of 75 per cent N with seed treatment plus broadcasting of *Azotobacter*. The increased yield may be due to the cumulative influence of the increased number of fruiting points and higher number of bolls per plant caused by the beneficial effect of *Azotobacter*. The seed cotton yield is correlated with boll production per plant by Padaki, *et al.* (1974). Treating cotton seeds with *Azotobacter* and broadcasting and mixing the culture in the soil before sowing with application of 75 per cent recommended dose of nitrogen was the most beneficial, since the requirement of cotton crop was reduced by 25 per cent through contribution of N by the *Azotobacter* treatment. The increase in yield of seed cotton by the use of *Azotobacter* is in conformity with the findings of Balakrishna, (1974) who obtained 16 8 per cent increase in seed cotton yield.

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