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Effect of inorganic and organic sources of nutrients on growth and yield of American hybrid cotton (*Gossypium hirsutum*)

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ABSTRACT

A field experiment was conducted during *Zaid* season of 2004 at Allahabad to response of American hybrid cotton to combined use of inorganic and organic sources of nutrient. Among the nutrients management practices, application of 80, 40 and 40 kg N, P_2O_5 and K_2O /ha in combination with farm yard manure and 2 times spray of urea @ 2 per cent at squaring and boll formation stage gave the best result. The observation registered during the trial were plant height, number of boll/plant, number of monopodial branches/plant, number of sympodial branches/plant, number of bolls/plant, total lint yield (q/ha.) and total seed yield (q/ha).

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KEY WORDS : Cotton, Inorganic and organic sources of nutrients, Yields components

Cotton is the most important fibre crop and is closely linked to human civilization itself. India ranks first in world in respect of area and third in total production. A low productivity of cotton is largely attributed to excessive growth and boll shedding, imbalance use of organic and inorganic sources of nutrients and poor agronomic practices of this crop. FYM improves NPK and humus content in soil that increases growth and yield of cotton. Hence, the present investigation was undertaken to see the response of American hybrid cotton to combined use of inorganic and organic sources of nutrients.

RESEARCH PROCEDURE

A field study was conducted at Crop Research Farm, Department of Agronomy, Allahabad Agricultural Institute – Demmed University Allahabad (U.P). The soil was sandy loam, pH 8.2, organic carbon 0.675 per cent, available nitrite 55.95 kg/ha, amonical nitrogen 11.25 kg/ha, potash 292.5 kg/ha and phosphorus 3.38 kg/ha. The trial was arranged in randomized block design, with three replications and nine treatments. The treatments included were T_1–100 per cent recommended dose of NPK, T_2–75 per cent recommended dose of NPK + 5 tones of FYM/ha +Foliar spray, T_3 – 75 per cent recommended dose of NPK + 25 per cent of FYM/ha + Foliar spray, T_4–75 per cent recommended dose of NPK + 5 tones of FYM/ha + No Foliar spray, T_5–75 per cent recommended dose of NPK + 50 per cent of FYM +Foliar spray, T_6–50 per cent recommended dose of NPK + 5 tones of FYM +Foliar spray, T_7–50 per cent recommended dose of NPK + 50 per cent of FYM +foliar spray, T_8–50 per cent recommended dose of NPK + 5 tones of FYM + No foliar spray, T_9–50 per cent recommended dose of NPK + 50 per cent of FYM +No foliar spray.

RESEARCH ANALYSIS AND REASONING

The data recorded during the course of investigation were tabulated, statistically analysed and results are intepreted here under appropriate heads:

Growth and yield attributes:

Plant height:

The Table 1 shows that the statistically superior plant height was registered in the treatment T_2 (75% recommended dose of NPK + 5 tones of FYM/ha +foliar spray) and was at par with the treatment T_1 (100% recommended dose of NPK), while the treatment T_9 (50% recommended dose of NPK + 50 % of FYM/ha + No foliar spray) recorded the minimum plant height at all stages of growth interval. However, treatment T_5 (75%

Table 1: Effect of inorganic and organic sources of nutrients on growth and yield of American hybrid cotton

Treatments	Plant height (cm) at 150 DAS	NMB/plant at 90DAS	NSB/plant at 90DAS	NOB/plant 135 DAS	Seed yield (q/ha)	Lint yield (q/ha)
T_1	131.27 a	17.90 a	19.72 a	27.97 b	22.27 b	13.92 b
T_2	132.11 a	17.93 a	19.78 a	29.00 a	25.48 a	17.24 a
T_3	129.29 b	17.40 b	19.08 a	27.47 b	21.13 c	13.22 c
T_4	124.45 c	16.37 c	16.13 b	24.93 c	21.51 c	12.83 c
T_5	123.25 c	14.89 d	15.13 b	24.00 d	20.38 d	12.20 d
T_6	121.11 d	14.80 d	13.53 c	23.20 e	18.93 e	12.17 d
T_7	121.05 d	14.73 d	11.50 d	23.20 e	18.27 e	11.79 d
T_8	119.61 e	13.78 e	13.14 d	22.77 e	18.16 e	10.86 e
T_9	117.03	13.73 e	11.80 d	22.40 f	17.37 f	10.39 e
F –test	S	S	S	S	S	S
S.E. ±	0.49	0.33	0.51	0.32	0.39	0.28
C.D. (P=0.05)	1.05	.070	1.09	0.69	0.82	0.58

NSB/plant = Number of sympodial branches / plant NMB/plant= No. of monopodial branches /plant
NOB/plant= No. of bolls /plant

recommended dose of NPK + 50% of FYM/ha + foliar spray) was at par with the treatment T_4 (75% recommended dose of NPK + 5 tones of FYM/ha + No foliar spray).

Number of monopodial and sympodial branches/ plant:

The Table 1 clearly indicates that the maximum number of monopodial and sympodial branches were recorded in the treatment T_2 (75% recommended dose of NPK + 5 tones of FYM/ha +foliar spray) than other treatment, however the treatment T_3 (75% recommended dose of NPK + 25 % of FYM/ha + foliar spray) was at par with the treatment T_1 (100% recommended dose of NPK)

The treatment T_9 (50% recommended dose of NPK + 50 % of FYM/ha+ No foliar spray) observed the minimum number of monopodial and sympodial branches / plant.

Number of boll/plant:

The effect of various treatments on the number of boll/plant are presented in the Table 1 showed significant difference. Statistical analysis of data clearly indicate that the treatment T_2 (75% recommended dose of NPK + 5 tones of FYM +foliar spray) recorded a significantly superior number of bolls than other treatments.

Total lint yield:

The statistical analysis of data reveals that superior lint yield was recorded in treatment T_2 (75% recommended dose of NPK + 5 tones of FYM/ha +foliar spray) (17.24 q/ha) while the treatment T_3 (75% recommended dose of NPK + 25 % of FYM/ha + foliar spray) recorded 13.22 q/ha which was at par with the treatment T_4 (75% recommended dose of NPK + 5 tones of FYM/ha + No foliar spray) 12.83 q/ha.

The treatment T_9 (50% recommended dose of NPK + 50 % of FYM/ha + No foliar spray) gave minimum yield (10.39 q/ha).

Total seed yield:

The Table 1 indicates that the statistically higher seed yield (25.48 q/ha) was registered in the treatment T_2 (75% recommended dose of NPK + 5 tones of FYM +foliar spray) than other treatments. While, minimum seed yield (17.37 q/ha) was found in the treatment T_9 (50% recommended dose of NPK + 50 % of FYM + No foliar spray). Effects of different nutrients on the yield of cotton were also observed by previous workers (Sawan, 1986 and Venugopalan and Blaise, 2001).

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