

Integrated nutrient management in irrigated cotton

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ABSTRACT

An experiment was carried to study various components of integrated nutrient management in irrigated cotton at Rahuri during the year 2003-2004. Seed cotton yield was significantly higher with 100% RDF + FYM @ 10 t/ha which was at par with 50% RDF + intercropping of sanhemp for *in situ* green manure. The number of bolls per plant and 100 seed weight was maximum in 100% RDF + FYM @ 10 t/ha which was at par with 50% RDF + intercropping of sanhemp for *in situ* green manure. Seed cotton weight per ball was maximum in the treatment 50% RDF + FYM @ 10 t/ha + foliar spray of 2 per cent urea + 2 per cent DAP at boll development. 50% reduction in RDF may possible without decreasing seed cotton yield significantly with the treatment 50% RDF+ intercropping of sanhemp for *insitu* green manuring.

Key words : INM, *Gossypium hirsutum* L., FYM

INTRODUCTION

Cotton (*Gossypium hirsutum* L.) is one of the most important fiber crops in India. Cotton is an important commercial crop grown in Deccan canal tract of Western Maharashtra. The area and productivity of this crop is on the decline. For maximum production farmer are using chemical fertilizer indiscriminately. Under such a situation it was imperative to evolve and adopt the strategy of integrated nutrient management by making judicious use of chemical fertilizers and organic manures, which will not only increase the production but will also, improve soil health ultimately sustaining the productivity of *hirsutum* cotton. In the present investigation various components of integrated nutrient management have been studied.

MATERIALS AND METHODS

An experiment was carried out at Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri during the year 2003-04, under irrigated conditions. The experiment was laid out in Randomized Block Design with four replications and ten treatments. Treatments consisted of T₁ – Control, T₂ – FYM @ 10 t/ha, T₃ – 100% RDF, T₄ – 100% RDF + FYM @ 10 t/ha, T₅ – 100% nitrogen, T₆ – 100% NP, T₇ – 50% RDF + FYM @ 5 t/ha, T₈ – 50% RDF + FYM @ 10 t/ha, T₉ – 50% RDF + FYM @ 10 t/ha + foliar spray of 2% urea at flowering + 2% DAP at boll development and T₁₀ – 50 % RDF + Intercropping of sanhemp for *in situ* green manuring. RDF : 100:50:50 NPK kg/ha.

The soil of experimental plot was clayey in texture, low in available N (105 kg/ha), very low in available P (7.35 kg/ha) and high in available K (526.0 kg/ha). The (*hirsutum*) cotton hybrid Phule -492 was sown by dibbling 2-3 seeds per hill at a spacing 90 x 90 cm, farm yard manure was applied 20 days before sowing as per treatments. Foliar spray of urea (2 %) was done at flowering and DAP (2%) at boll development stage. Optimum plant population was maintained in all the experimental plots by gap filling, thinning at appropriate time. At the time of first picking, five randomly selected plants were taken for observation of the plant growth characters viz., plant height, number of bolls per plant, seed cotton weight per boll, 100 seed weight, seed cotton yield. Adequate plant protection measures were taken as per recommendations.

RESULTS AND DISCUSSION

The data on yield attributing characters as influenced by different treatment combinations are summarized in Table 1. The data revealed that combinations of organic manure with inorganic fertilizer had positive effect than alone on the production of cotton. Maximum plant height was observed in the treatment application of 50% RDF + intercropping of sanhemp for *insitu* green manuring which was found to be at par with treatments T₆, T₈, T₄, T₉, T₇, T₃

At harvest, the number of bolls per plant, and 100 seed weight was maximum in treatment 100% RDF + FYM @ 10 t/ha which was at

Table 1 : Plant height, number of bolls per plant, seed cotton per boll, 100 seed weight and seed cotton yield as influenced by different treatments.

Sr. No.	Treatments	Plant height (cm)	No. of Bolls per plant	Seed cotton per Boll (g)	100 seed weight (g)	Seed cotton yield (q/ha)
1.	T ₁ – Absolute Control	118	52	3.49	6.7	8.92
2.	T ₂ – FYM @ 10 t/ha	125	55	3.61	7.0	14.18
3.	T ₃ – 100% RDF	128	63	3.79	7.5	16.47
4.	T ₄ – 100% RDF + FYM @ 10 t/ha	131	72	3.61	8.0	19.72
5.	T ₅ – 100% Nitrogen	125	60	3.50	7.0	14.70
6.	T ₆ – 100% Nitrogen + 100% Phosphorus	130	68	3.78	7.2	16.08
7.	T ₇ – 50% RDF + FYM @ 5 t/ha	129	70	3.78	7.6	17.15
8.	T ₈ – 50% RDF + FYM @ 10 t/ha	136	62	3.55	7.3	15.50
9.	T ₉ – T ₈ + foliar spray of 2% urea and 2% DAP	130	64	4.10	7.5	16.73
10.	T ₁₀ – 50 % RDF + Intercropping of sanhemp for <i>in situ</i> GM	137	70	3.75	7.8	19.01
	SE ±	3.57	2.30	0.07	0.54	0.82
	CD at 5%	10.30	6.80	0.20	1.39	2.38

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par with 50% RDF + intercropping of sanhemp of *in situ* green manuring. The maximum seed cotton weight per boll was recorded in treatment 50 % RDF + FYM @ 10 t/ha + foliar spray of 2 per cent urea + 2 per cent DAP at boll development.

Significantly higher seed cotton yield per ha (19.72 q/ha) was recorded in treatment 100% RDF + FYM @ 10 t/ha and it was at par with 50 % RDF + intercropping of sanhemp of *in situ* green manuring (19.01 q/ha). Both these treatments were significantly superior over rest of the treatments while, the treatment T₁₀, T₇, and T₉, were at par with each other. Charjan (2001) reported that the seed cotton yield was significantly high with application of 100% RDF + FYM 10 t/ha which was at par with 100 RDF + Green manuring + Azospirillum + Phosphate solubilising bacteria

Beneficial effect of nitrogen application was also reported by Patel *et al.* (1992) and Nehra *et al.* (2004). Yield in the plots receiving FYM might be due to the improve nutrient in the soil physical environment influencing plant growth (Das, 1996). In corporation of sanhemp also increased the yield. This was probably due to the fact that green manure improved the physico chemical properties of the soil and nutrient are available of proper time (Raskar, 2004).

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