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Studies on Effect of Integrated Nutrient Management on Productivity of Cotton in Rainfed Condition

Megha S. Khambalkar, V.V. Gabhane and Shilpa V. Khambalkar*

Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, India
**Corresponding author*

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A B S T R A C T

An experiment "Nutrient dynamics and productivity of Cotton in Vertisols under integrated nutrient management" was conducted during *kharif* 2014 at Research field of AICRP for Dryland Agriculture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola to study the effect of integrated nutrient management on Yield of cotton and Nutrient uptake by cotton. The experiment was conducted with ten treatments and three replications laid out in a randomized block design. The result of present experiment revealed that the significantly higher seed cotton yield (607.68 kg ha^{-1}) was observed with application of 50% N through gliricidia + 50% N through inorganics + biofertilizers+ 100% P + 25 kg K ha^{-1} (T_{10}) and it was on par(485.59 kg ha^{-1}) with the application of 100% NP +biofertilizers + 25 kg K ha^{-1}(T_7).

Introduction

Cotton is one of the important commercial crops and is grown predominantly under rainfed condition in Vidarbha region. Cotton seed contain 15-20 percent oil and used as vegetable oil in soap industries. After extraction of oil, the left over cake, a byproduct of cotton mill is very important feed for livestock. It can also be used as manure as it contains 6.4% N, 2.9% P and 2.2% K.

Adequate and timely application of organic and also inorganic fertilizer is most essential for proper growth of the crop. Nutritional stresses and imbalance affect vegetative as well as reproductive growth that ultimately lower down the average seed cotton yields as well as fibre and seed quality. Combination of FYM, Gliricidia with inorganic fertilizer result in higher addition of organic matter

Materials and Methods

A field experiment was conducted with ten treatments and three replications laid out in a randomized block design (Fig.2) at Research field of AICRP for Dryland Agriculture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The present study was undertaken during 2014-15 with the cotton crop. The cotton seed was inoculated with Azotobacter and PSB 25 g kg^{-1} seed as seed treatment and sown with seed rate of 10Kg/ha with recommended dose i.e., 50:25:0 kg/ha at a spacing of 60cm(row to row) and 30cm(plant to plant). There were ten treatments

comprising T_1 – Control, T_2 -100% NP (50:25:00 NPK kg ha^{-1}), T_3 -100% NP + biofertilizers, T_4 -100% N through FYM + biofertilizers, T_5 -100% N through gliricidia + biofertilizers, T_6 -100% NP + 25 kg K ha^{-1}, T_7-100% NP + 25 kg K ha^{-1} + biofertilizers,T_8-50% N through gliricidia + 50% N through inorganics + 100% P, T_9-50% N through gliricidia + 50% N through inorganics + biofertilizer + 100% P, T_{10}- 50% N through gliricidia + 50% N through inorganics + biofertilizers +100% P +25 kg K ha^{-1}.

Results and Discussion

The data on seed and stalk yield of cotton (Table 1) was significantly influenced by various treatments. The significantly higher seed cotton yield (607.68 kg ha^{-1}) was observed with application of 50% N through gliricidia + 50% N through inorganics + biofertilizers+ 100% P + 25 kg K ha^{-1} (T_{10}) and it was on par (485.59 kg ha^{-1}) with the application of 100% NP +biofertilizers + 25 kg Kg ha^{-1} (T_7). The lowest seed cotton yield (247.60 kg ha^{-1}) was recorded in treatment T_1 *i.e.* control.

Table.1 Effect of INM on yield of cotton

Treatments		Yield (kg ha^{-1})	
		Seed cotton	Cotton stalk
T_1	Control	247.60	474.22
T_2	100% NP (50:25:00 NPK kg ha^{-1})	321.67	615.30
T_3	100% NP + biofertilizers	331.27	631.37
T_4	100% N through FYM + biofertilizers	260.63	498.87
T_5	100 % N through gliricidia+ biofertilizers	257.89	510.61
T_6	100% NP+ 25kg K ha^{-1}	400.55	790.37
T_7	100% NP + 25kg K ha^{-1} + biofertilizers	485.59	957.65
T_8	50% N through gliricidia + 50% N through inorganics +100% P	334.02	658.91
T_9	50% N through gliricidia + 50% N through inorganics + 100% P +biofertilizers	355.96	702.16
T_{10}	50% N through gliricidia +50% N through inorganics+ 100% P+ biofertilizers + 25kg K ha^{-1}	607.68	1198.13
	SE (m) ±	51.73	102.24
	CD at 5%	153.72	303.77

The significantly higher cotton stalk yield (1198.13 kg ha^{-1}) was observed with the application of 50% N through gliricidia + 50% N through inorganics + biofertilizers+ 100% P + 25 kg K ha^{-1} (T_{10}) and it was found to be on par with application of 100% NP + biofertilizers + 25 kg K ha^{-1} (T_7). The lowest (474.22 kg ha^{-1}) stalk yield was recorded in treatment T_1 *i.e.* control.

It is concluded that integrated application of 50% N through gliricidia + 50 % N through inorganics + biofertilizers+ 100% P+ 25 kg K ha^{-1} resulted in improvement of soil fertility,

nutrient uptake and yield of cotton grown in Vertisols under rainfed conditions.

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