



EFFECT OF DIFFERENT ORGANICS AND GREEN MANURE ON GROWTH AND YIELD ATTRIBUTES AND SEED COTTON YIELD IN *ARBOREUM* COTTON (CAD-4)

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Abstract

A field experiment was conducted during *Kharif* season of 2012 and 2014 at C.S. Azad University of Agricultural and Technology, Kanpur to study the effect of different organics and green manure on growth and yield attributes and seed cotton yield in *arboreum* cotton (CAD-4). Data indicated that application of 5 tonne vermicompost/ha +seed treatment with Azatobactor +PSB @ 25 g each /kg of seed improved significantly all the growth and yield attributing characters over control (no organics and inorganics). Application of 5 tonne vermicompost/ha +seed treatment with Azatobactor +PSB @ 25 g each /kg of seed produced significantly seed cotton yield (967 kg/ha), lint yield (387 kg/ha) and seed yield (579 kg/ha) as compared to control (562kg, 216 kg and 345 kg/ha) seed cotton yield, lint yield and seed yield, respectively. Application of castor cake @ 500 kg/ha recorded significantly higher seed cotton yield (805 kg/ha) over control. Application of 10 tonne FYM/ha + seed treatment with Azatobactor +PSB @ 25 g each /kg of seed also recorded significantly more seed cotton yield (776 kg/ha) as compared to control. Highest GOT 40.10 % was observed with 5 tonne vermicompost/ha +seed treatment with Azatobactor +PSB @ 25 g each /kg of seed followed by RD of nutrient through organic based on P equivalent +Green manuring of sesbania 50 kg seed /ha(39.0 %) over control (39.05 %).

Key words : Azatobactor, biofertilizer, FYM, green manure, Lint yield, PSB, seed cotton yield, seed yield and vermicompost.

Introduction

Cotton is an important cash and fiber crop of India playing significant role in Indian economy by contributing 1/3 earning to the country. Cotton is grown in India on area about 12.23 mh with production of 377 lakh bales and productivity of 524 kg/ha. India has first rank in area as well as production in the world. (Anonymous, 2017). In UP, generally farmers are adopting multiple cropping systems in a year by using chemical fertilizers only for getting more production. By which, soil health is getting deteriorate due to non-supply of organic manure and green manure in the soil. So, there is utmost need to improve soil health by adding the organics and green manure in addition to bio fertilizers in the soil which may not only increase the production, but improve the soil health for sustaining the productivity of cotton. Bio fertilizer make the soil rich of nutrients by using micro organisms that

also stabilise symbiotic relationships with the plants therefore these are cost effective renewable sources of plant nutrients which are alternative to the chemical fertilizers. These bio fertilizers also mobilizes nutritionally important elements from non usable to usable form (Rajendra *et al.*, 1998). Keeping the above fact in mind, the present investigation was carried out to see the effect of different organics and green manure on yield attributes and seed cotton yield in *arboreum* cotton (CAD-4).

Materials and Methods

The field experiment was conducted during *kharif* seasons from 2012 and 2014 at Oil Seed Farm, Kalyanpur of C.S. Azad University of Agriculture and Technology, Kanpur to study the effect of of different organics and green manure on growth and yield attributes and seed cotton yield in *arboreum* cotton (CAD-4). In all 8 treatments *viz* T₁-5t FYM+seed treatment with

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Table 1 : Effect of different organics and green manure on growth and yield attributes and seed cotton yield in *arboreum* cotton (CAD-4). (Two years pooled data)

S. no.	Treatments	Plant height (cm)	No of boll/ plant	Boll wt(g)	Seed cotton yield(kg/ha)	Got%	Lint yield (kg/h)	Seed yield (kg/ha)
1	T1-5tFYM+seed treatment with Azatobactor and PSB @25 g/kg seed	115.68	20.10	2.68	735	39.5	283	442
2	T2-2.5 vermicompost+seed treatment with Azatobactor and PSB @25 g/kg seed	114.78	19.13	2.83	895	39.2	352	544
3	T3-10tFYM+seed treatment with Azatobactor and PSB @25 g/kg seed	120.16	20.53	2.62	776	39.4	308	475
4	T4-5 vermicompost+seed treatment with Azatobactor and PSB @25 g/kg seed	119.23	22.25	2.77	967	40.1	337	579
5	T5- <i>In situ</i> green manuring of sesbania+ seed treatment with Azatobactor and PSB @25 g/kg seed	115.83	21.81	2.70	766	39.5	297	469
6	T6-Castor cake@500 kg/ha	106.46	19.63	2.66	805	36.8	318	479
7	T7-RD of Nutrient through organic based on P equivalent+green manuring of sesbania	116.69	19.24	2.77	754	39.6	300	453
8	T8-Control(no organic and inorganic)	98.67	12.21	2.52	562	39.0	216	345
	CD at 5%	8.85	3.50	0.115	147.16	0.48	55.09	101.25

Azatobactor and PSB @ 25 g/kg seed T₂-2.5 vermicompost+seed treatment with Azatobactor and PSB @ 25 g/kg seed T₃-10t FYM+seed treatment with Azatobactor and PSB @ 25 g/kg seed T₄-5 vermicompost + seed treatment with Azatobactor and PSB @ 25 g/kg seed T₅-*In situ* green manuring of sesbania + seed treatment with Azatobactor and PSB @ 25 g/kg seed T₆-Castor cake @ 500 kg/ha T₇-RD of Nutrient through organic based on P equivalent+green manuring of Sesbania T₈-Control (no organic and inorganic) were tested in randomized block design with three replication on *arboreum* cotton variety (CAD-4). The soil of experimental field was sandy loam in texture having pH of 7.6, low in available OC% (0.37), medium in available P₂O₅ (17 kg/ha) and high in available K₂O (270 kg/ha). Cotton planting was done at spacing of 67.5x30 cm on 28.05.12 and 11-06-2014 during 1st and 2nd, years, respectively. All the organics manure and bio fertilizer were applied as per treatments. Picking of the crop was done on 30-10-12 and 10-11-14 during 1st and 2nd years of study, respectively.

Results

Two years pooled data revealed (table 1) that all the organics, green manure and biofertilizers improved all the growth and attributing characters and yield during both the investigation years over control. Application of 5 tonne vermicompost/ha + seed treatment with Azatobactor +

PSB @ 25 g each/kg of seed improved significantly all the growth and yield attributing characters over control (no organics and inorganics). Application of 5 tonne vermicompost/ha + seed treatment with Azatobactor +PSB @ 25 g each/kg of seed produced significantly higher seed cotton yield (967 kg/ha), lint yield (387 kg/ha) and seed yield (579 kg/ha) as compared to control (562kg, 216 kg and 345 kg/ha)seed cotton yield, lint yield and seed yield, respectively. Application of castor cake @ 500 kg/ha recorded significantly higher seed cotton yield (805 kg/ha) over control. Application of 10 tonne FYM/ha + seed treatment with Azatobactor +PSB @ 25 g each/kg of seed also recorded significantly more seed cotton yield (776 kg/ha) as compared to control and this yield was at par with 2.5 tonne vermicompost/ha + seed treatment with Azatobactor + PSB @ 25 g each/kg of seed (895 kg/ha). The increase in seed cotton yield with the organic manure and green manure might be due obtained more yield attributing characters *viz.* bolls/plant and boll wt(g) of cotton and due to availability of nutrients in the balanced form with good soil environment. These results are in conformity with the finding of Katkar *et al.* (2002), Kumar and Yadav (2007), Nehra and Godara (2010) and Solunke and Fatak (2010 and 2011), highest GOT 40.10% was observed with 5 tonne vermicompost/ha + seed treatment with Azatobactor + PSB @ 25 g each/kg of seed followed by RD of nutrient through organic based on P equivalent + Green manuring of

sesbania 50 kg seed/ha (39.0%) over control (39.05%). Ginning % was effected significantly due to either application of green manure and vermicompost or no fertilizer. These results are in conformity with the finding of Rao and Janawade (2009).

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