



Effect of various composts of *cassia* on growth of *Trigonella*

Madhukar D Ahire

Department of Botany, MGV, Arts, Science and Commerce College Manmad Tal- Nandgaon, Nashik, Maharashtra, India

Abstract

Cassia tora L. commonly called as “Tarwad” which belongs to the family Caesalpiniaceae. It is always seen along the roadsides, wastelands and field bands. The aerial biomass of *Cassia* was collected from different field sites, road sides and chopped into small pieces. Equal amount of fresh vegetation was used as green manure, for the preparation of compost, vermicompost and dry leaf manure. The leafy vegetable *Trigonella foenum graecum* L. was cultivated in the plot size, 1.5x1.5 m. with six treatments and four replicates. The growth analysis of the crop noted after 37 days of cultivation as total fresh weight, total dry weight, height of plant, circumference, number of leaves, leaf area, chlorophyll a and Chlorophyll b, total chlorophyll, reducing sugar and vitamin-C were estimated from leaves in all treatments.

The plants in the control plots were weak as compare to crop cultivated on *Cassia* manure treatment. The observations showed that the vermicompost had given best yield for fresh weight followed by compost and Dry leaf powder. The control vegetation gives lowest yield, followed by NPK and then green manure treatment. *Cassia* manuring gives better results and reduces the production cost of the crop and protects the vegetable from adverse effects of chemical fertilizers on crop as well as land.

Keywords: *Cassia tora* L, Manure, *Trigonella foenum graecum* L. Vermicompost

Introduction

The application of manures to soil provides potential benefits including improving the fertility, structure, water holding capacity of soil, increasing soil organic matter and reducing the amount of synthetic fertilizer needed for crop production. Nitrogen mineralization differs for different manure types since the inorganic and organic fraction and quality of organic nitrogen varies [3]. Poultry manure which has rapid nitrogen release is used for crops with high nitrogen demands. The prices of chemical fertilizer are increasing day by day resulting in an increase in the cost of imputes in agriculture. This also has resulted in use of unbalanced nutrient ratio, which may affect soil productivity.

Today there is an urgent need for sustainable production through integrated nutrient management. In this investigation efforts have been made to search indigenous weed plant species used for production of better compost.

Materials and methods

The experiment was conducted in the well ploughing farm. The experimental design was randomized block design with four replicates and six treatments. The fresh green leafy vegetation of *Cassia* was collected from different sites early in the morning at 5 to 10 % flowering stage, chopped into small pieces (2to3cm). Equal amount of fresh vegetation was used for the preparation of green manure (GM), compost, vermicompost (VC), and Dry leaf manure (DLM). These were mixed with the soil in the research plots. The *Trigonella* variety produced by Vijay Seed Company Nasik was cultivated.

The growth analysis of the *Trigonella* crop was noted after 37 days of cultivation as total fresh weight, total dry weight, height of plant, circumference, number of leaves, leaf area, chlorophyll a, chlorophyll b, total chlorophyll, vitamin-C and reducing sugar were estimated from leaves in all treatments.

All the results were statistically analyzed by the method of Analysis of variance and found significant over control.

Result and Discussion

Table1. The growth analysis of *Trigonella* was done at 37 DAS. During growth analysis, Height of the plant was highest in VC followed by GM, COMP, DLM and NPK and lowest in CON. Number of leaves per plant was highest in VC followed by DLM, COMP, GM and NPK treatment and lowest in CON. Leaf area was highest in VC followed by GM, NPK, DLM and COMP treatment and lowest in CON. Circumference was highest in VC followed by COMP, GM, CON and DLM and lowest in NPK. The content of chlorophyll a, chlorophyll b, and total chlorophyll was found highest in VC [4]. The content of chlorophyll was estimated by using 80% acetone as solvent for extraction of the pigment.

Table 2. Shows that, the fresh weight of *Trigonella* (kg/ha) was found maximum in the treatment of VC followed in order by COMP, DLM, GM and NPK while it is minimum in CON. Similarly the dry matter (kg/ha) was found maximum in the treatment of VC followed in order by COMP, DLM, GM and NPK, while it was found minimum in CON.

Nitrogen and Crude protein content (kg/ha) was highest in VC followed by COMP DLM GM and NPK treatment and lowest in CON respectively. This result was significant for all treatment. The content of Phosphorus (P) was highest in DLM followed by COMP, GM, NPK and VC treatment and lowest in CON. The content of Potassium (K) was highest in COMP followed by NPK, DLM, VC, and GM treatment and lowest in CON. The content of Calcium (Ca) was highest in VC followed by DLM, GM, NPK, COMP treatment and lowest in CON. The content of Reducing Sugar (kg/ha) (RS) was highest in VC followed by COMP, GM, DLM and CON treatment and lowest in NPK. These results are statistically significant except NPK treatment.

Table 1: Growth Analysis of *Trigonella* influenced by *Cassia* weed manure

Treatment	Fresh Wt.		Dry Matter		Nitrogen		Crude protein		Total R. S		%			
	Plot ¹	Kg/ha	%	Kg/ha	%	Kg/ha	%	Kg/ha	%	Kg/ha	Ash	Ca	P	K
COMP	4.892	21742	17.45	3794	1.85	70	11.56	440	2.32	85	9.70	1.01	0.48	0.18
DLP	4.787	21276	16.72	3557	1.64	58	10.25	365	1.68	60	11.50	1.47	0.62	0.16
VC	4.897	21764	17.50	3809	1.99	76	12.49	475	2.61	99	11.15	1.68	0.40	0.16
GM	4.39	19511	17.71	3455	1.68	58	10.51	363	2.21	76	10.28	1.37	0.45	0.16
NPK	4.027	17898	16.16	2892	1.69	49	10.62	306	1.29	37	9.66	1.16	0.45	0.16
CON	3.538	15724	14.75	2319	1.39	32	8.69	201	1.77	41	9.66	1.05	0.36	0.14
SE		1000		240		6		40		10				
CD		2570		617		16		103		26				

Table 2: Chemical analysis of *Trigonella* cultivated on *cassia* weed manure

Treatment	Height of the plant (cm)	Total fresh wt./plot	Circumference	No. of leaves Per plant	No. of Nodules per plant	Leaf area sq/cm	Chlorophyll a	Chlorophyll b	Total Chlo
COMP	32.37	4.90	1.25	21.00	3.00	7.29	0.586	0.631	1.217
DLM	32.25	4.78	1.00	21.00	6.75	7.83	0.709	0.665	1.374
VC	33.50	4.89	1.32	25.75	4.50	8.16	1.089	0.952	2.014
GM	33.20	4.39	1.22	20.50	2.25	8.03	0.653	0.747	1.400
NPK	31.45	4.02	0.97	19.75	3.25	7.89	0.695	0.703	1.398
CON	30.55	3.54	1.10	16.00	2.25	6.96	0.837	0.795	1.632

COMP - Compost, DLM - Dry leaf manure, VC- Vermi-compost, GM - Green manure, CON - Control, SE - Standard error, CD- Critical difference

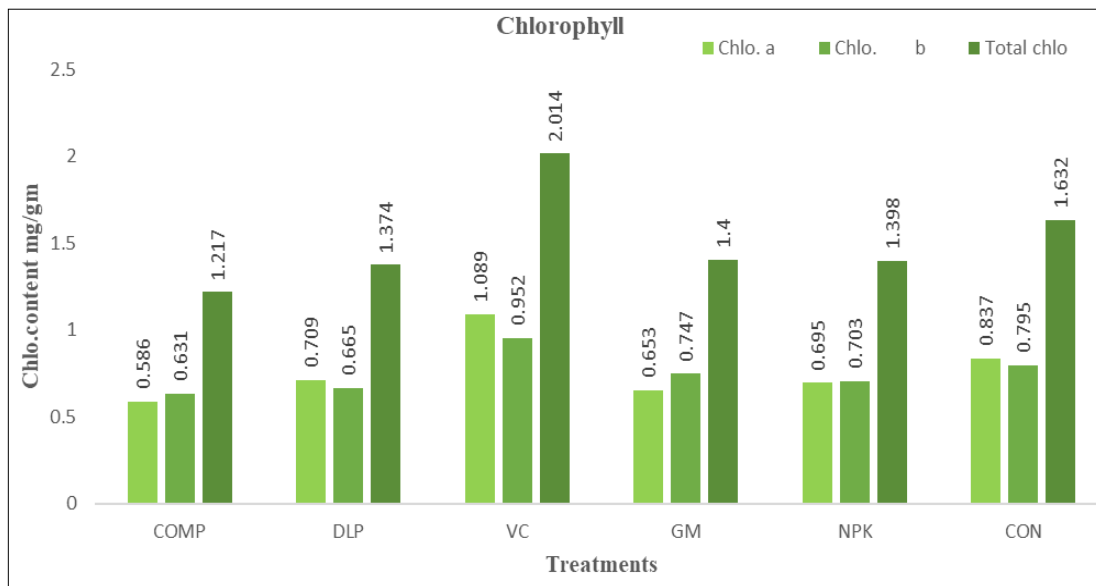


Fig 1: Showing chlorophyll content in *Trigonella*

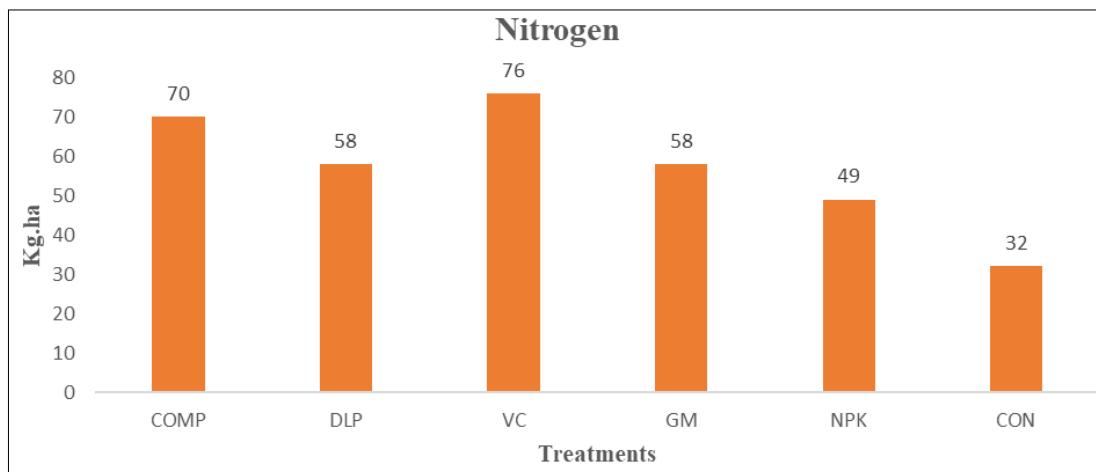


Fig 2: Showing Nitrogen content in *Trigonella* (kg/ha)

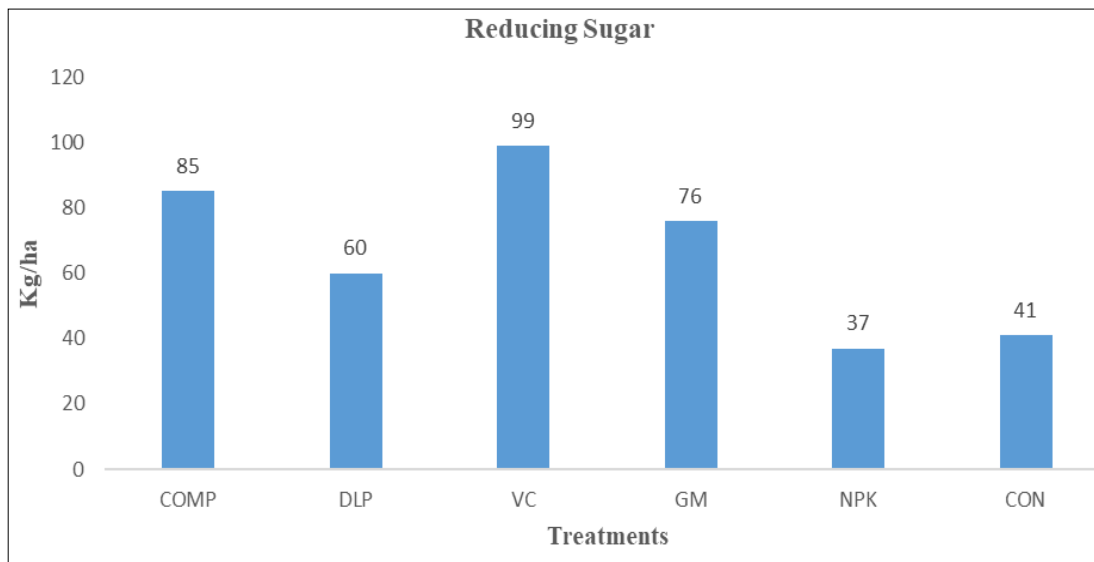


Fig 3: Showing Reducing sugar content in *Trigonella* (Kg/ha)

Conclusion

The plant in the control plots were weak as compared to crop cultivated on *Cassia* manure treatment. The observation showed that the compost had given the best yield for total fresh weight, Dry matter and total reducing sugar. Similarly nitrogen, crude protein and content of calcium were found more in vermicomposting treatment. *Cassia* manuring gives better results and reduces the production cost and protects the vegetable crop from adverse effect of chemical fertilizer on crop as well as land.

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