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EFFECT OF BIO STIMULANTS ON GROWTH AND HERBAGE YIELD OF FENUGREEK VAR. CO 1

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ABSTRACT

An experiment was conducted to study the effect of biostimulants on plant growth, herbage yield, quality and cost economics in fenugreek variety CO 1. The experiment was conducted in a Randomized Block Design (RBD). Foliar spray of Panchagavya (3 %, 6 %) %), Vermiwash (3 %, 6 %), TNAU Pulse wonder (2 %, 4 %), and Humic acid (0.2 %, 0.4 %) were used as treatments. Among the various treatments used, treatment T_2 – Panchagavya 6 % showed better results in growth parameters such as Plant height (32 cm), Number of leaves (23.33), Number of branches (8.33) and Dry matter content (1.01 g), root parameters like Number of roots (7), Root length (13.76 cm), Number of Nodules (21.66), chlorophyll a, b and (2.65 mg/g, 1.13 mg/g and 3.11 mg/g), maximum herbage yield of 5.5 kg plot^{-1} with an estimated yield of about 6.11 t per hectare followed by the treatment T_4 with 6 % vermiwash and the least values were observed in Control T_9. Findings from the present study reveal that foliar spray of 6 % Panchagavya at 20 DAS in fenugreek variety CO 1 will enhance the growth and herbage yield.

***KEYWORDS**: Fenugreek, Herbage Yield, Panchagavya, Vermiwash*

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INTRODUCTION

Trigonella foenum-graecum, Fenugreek is a multipurpose annual herb the plants are semi-erect, tall, moderately branched with bold, typically yellow grains native to South Eastern Europe and West Asia. Fenugreek as a valuable medicinal plant with potential for curing diseases and as a source for preparing raw materials of in steroidal hormones. It has hypoglycemic, hypocholesterolemic and anti-inflammatory effects. It prevents constipation, removes indigestion and stimulates digestive process. Seeds are used for the treatment of dysentery, diarrhoea, rickets and diabetes. Fenugreek seeds contain a steroid called diosgenin (0.62 %–2.20 %) which is mainly used for the preparation of sex hormones and contraceptive pills. The seeds are bitter in taste due to the presence of alkaloid “Trigonelline” (Das, 2014). The demand for fenugreek seeds and leaves increased because of its higher medicinal values. It is used as a substitute for Medicinal Yam. To meet out the demand the production needs to be increased through adoption of improved cultural practices. Beneficial effects of various biostimulants has been reported on many spice crops and proved that they also improve yield and quality. In the recent years, the use of biostimulants has been increasing and their application is becoming a common practice in the

sustainable agriculture. Based on nutrient availability, biostimulants improve the nutrient use efficiency and plant productivity. Hence, the proposed work was planned in fenugreek crop with the objectives to study the effect of biostimulants on plant growth, herbage yield and cost economics.

MATERIALS AND METHODS

Field experiment was carried out at carried out during October 2021 in a farmer's field at Vadapalani village of Erode district. This experiment was laid out in a Randomized Block Design (RBD) with three replications with the plot size 3 x 3 m. Before sowing fertilizers are applied at the rate of 10:12:12 (NPK kg ha-1). Seeds are line sowed at the rate of 25 kg ha-1. Treatment details are T1 – Panchagavya (3 %), T2 – Panchagavya (6 %), T3 - Vermiwash (3 %), T4 – Vermiwash (6 %), T5 – TNAU Pulse wonder (2 %), T6 – TNAU Pulse wonder (4 %) and T7 – Humic acid (0.2 %), T_8 – Humic acid (0.4 %) and T_9 - Control. Foliar spray of these bio stimulants were given at 20 DAS and the observations on growth and yield parameters were recorded at the time of harvest *i*.e., 30 DAS.

RESULTS AND DISCUSSIONS

Among the various treatments used, (Table 1) treatment T2 – Panchagavya 6 % showed better results in growth parameters such as Plant height (32 cm), Number of leaves (23.33), Number of branches (8.33) and Dry matter content (1.01 g), root parameters like Number of roots (7), Root length (13.76 cm), Number of Nodules (21.66), chlorophyll a, b and (2.65 mg/g, 1.13 mg/g and 3.11 mg/g), maximum herbage yield of 5.5 kg $plot^{-1}$ with an estimated yield of about 6.11 t per hectare followed by the treatment T4 with 6 % vermiwash and the least values were observed in Control T9. The maximum B:C ratio was observed in the treatment T2 – Panchagavya 6 % (3.89) followed by T4 - 6 % vermiwash (2.87) when compared with control (1.88). Higher plant height may be due to increased cell division and cell elongation because panchagavya have the ability to produce growth regulators like Auxin and Cytokinin (Azizi *et al*., 2005).

Panchagavya is fermented organic manure with high microbial load with effective microorganisms (EMO) and methylotrophs profile bacteria. These EMO in panchagavya would have enhanced the productivity of phytohormones like auxins and gibberellins, that might have in turn, stimulated the growth by increasing the growth parameters *viz.*, plant height, plant spread, number of laterals, number of leaves and leaf area (Sivakumar, 2004). Total chlorophyll content may also be increased due to the availability of nutrients especially nitrogen and magnesium which are the major components of chlorophyll pigment. The conspicuous impact of panchagavya on growth attributes of fenugreek might be due to their rapidly available form of nutrients, which are easily absorbed, leading to faster growth and development of fenugreek components. Fermented liquid organic manures contain macro and micro-nutrients, many vitamins, essential amino acids, numerable microorganism and growth promoting substances like IAA, GA *etc*. Similar results were also obtained by Elumalai *et al.*, (2013) and Jondhale *et al.* (2014).

CONCLUSIONS

Findings from the present study reveal that foliar spray of 6 % Panchagavya at 20 DAS in fenugreek variety CO 1 will enhance the growth and herbage yield. This may be due to the application of organic nutrients induce better utilization of water and nutrients for plant growth and development and also improved photosynthetic efficiency of individual plants, thereby resulting in increased yields. Similar findings on the increase in growth attributes due to application of panchagavya has been reported by Sridhar (2003) in black nightshade, Selvaraj *et al.* (2003) in thyme and rosemary, Kanimozhi (2003) and Sathiaraj *et al.* (2006) in *Coleus forskohlii*.

REFERENCES

1. *Das, N.2014.Compost (Biodegradable Waste Management Methods) as a means of sustainable agriculture in North-Eastern Region of India. Research Journal of Agriculture and Environmental Management, 3(7):334-339.*
2. *Elumalai D, Kaleena PK, Fathima M, Hemavathi M. 2013. Influence of Vermiwash and Plant growth regulators on the Exomorphological characters of Abelmoschus esculentus (Linn.) Moench, African J. of Basic and Applied Sciences. 5(2):82-90.*
3. *Jondhale DG, Kolambe BN, Shinde RD. 2014.Performance of organic rice grown over application of different organic sources with reference to growth parameters in south Gujarat. Trends in Bioscience. 7(23):3908-3910.*
4. *Kanimozhi, C. 2003. Standardization of organic production package for Coleus forskohlli Briq. M.Sc. (Hort.) Thesis, Tamil Nadu Agricultural University, Coimbatore, T.N. (INDIA).*
5. *Sathiaraj, M., Thirumurugan, V. and Balasubramanian, R. 2006. Effect of organic, Inorganic fertilizers and plant growth substances on productivity of medicinal coleus (Coleus forskhlii Briq.) Proc. Int. conference on Globalization of Traditional, complementary and alternative systems of medicine, 16-18 March, 2006 held at Tamil Nadu Agricultural University, 72 pp*
6. *Selvaraj, J., B. Ramaraj, K. Devarajan, N. Seenivasan, S. Senthilkumar, E. Sakthi. 2003. Effect of organic farming on growth and yield of thyme. In: Articles and Abstracts of National Seminar on Production and Utilization of Medicinal Plants, 13- 14, March, 2003 held at Annamalai University, Tamil Nadu,63.*
7. *Sivakumar, V. 2004. Response of bhendi [Abelmoschus esculentus (L.) Moench] to combined application of NPK with organic manures and zinc. M.Sc. (Ag.) Hort. Thesis, Annamalai University, Annamalainagar, T.N. (INDIA).*
8. *Sridhar, T. 2003. Effect of bio-regulators on black nightshade (Solanum nigrum L.) M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore, T.N. (INDIA).*

APPENDIX

Table 1: Effect of Bio Stimulants on Growth and Herbage Yield of Fenugreek Var. Co 1

Treatments	Plant Height (cm)	Branches Plant^{-1}	No. of Leaves Plant^{-1}	Total Chlorophyll Content (mg / g)	Dry Matter Accumulation (g)	No. of Roots / Plant	Root Length (cm)	No. of Nodules / Plant	Yield/Plot (kg)
T1	24.76	6.67	15.68	2.94	0.87	4.31	8.30	16.35	4.04
T2	32.00	8.33	23.33	3.11	1.01	7.01	13.76	21.65	5.50
T3	26.60	6.34	18.00	2.10	0.91	5.54	10.13	18.38	4.42
T4	30.00	7.65	20.66	2.97	0.97	6.00	11.83	20.00	4.90
T5	22.90	5.67	14.00	2.52	0.79	3.97	7.30	14.32	3.73
T6	21.20	5.00	11.39	2.31	0.70	3.12	6.10	12.31	2.90
T7	20.19	4.31	10.04	1.87	0.61	2.94	5.94	11.01	2.33
T8	18.94	3.65	9.87	1.72	0.58	2.00	5.00	10.75	2.01
T9	14.86	2.31	8.56	1.12	0.56	1.00	4.33	9.44	1.67
SE (d)	**0.70**	**0.36**	**0.688**	**0.068**	**0.013**	**0.19**	**0.27**	**0.58**	**0.16**
CD (0.05)	**1.5**	**0.726**	**1.35**	**0.150**	**0.030**	**0.38**	**0.54**	**1.05**	**0.33**