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SHORT COMMUNICATION **OPEN ACCESS**

Effect of Application different Organic Growth Promoters on yield of Leafy Vegetables under Parbhani conditions

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ABSTRACT
The Present investigation on was undertaken at the Instructional-Cum-Research-Farm, College of Horticulture, V.N.M.K.V., Parbhani, during Kharif 2017. The experiment was laid out in Randomized Block Design with seven treatments replicated thrice. The maximum values of yield parameters viz. maximum fresh weight of whole plant of Amaranthus (17.50 g), Methi (4.57 g) and Palak (61.47 g), weight of root of Amaranthus (0.83 g), Methi (0.50 g) and Palak (3.43 g), yield per plot and yield per hectare of Amaranthus (4.03 kg and 201.50 q/ha), Methi (1.65 kg and 82.50 q/ha) and Palak (3.50 kg and 175 q/ha), fresh weight of marketable produce per plot and per hectare of Amaranthus (3.70 kg and 185 q/ha), Methi (1.54 kg and 77 q/ha) and Palak (3.08 kg and 154 q/ha) were recorded with the application of RDF + vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% treatment. The treatment receiving only RDF has shown at par results for yield and yield attributes.
Keywords: *Amaranthus, Methi, Palak, organic growth promoters*

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INTRODUCTION

In present agricultural system poses a great threat to the sustainability of our agro-eco-system under such situation it is essential to look for alternatives which are effective and eco-friendly. During recent years organic farming system is gaining lot of importance on account of hazardous effects of chemical farming system. So, organic manures, bio-pesticides, bio-fertilizers and bio-growth promoter must be used either alone or in judicious combination to maintain the ecological balance. Reviews of current trends in organic practices have reported improved yield in crops in rainfed areas of India, especially in drought years [5]. A decrease in yield in the initial years, with no significant yield difference under drought conditions, has been cited in varies studies [4] as the effect of a transition to organic status. The use of vermiwash, panchgavya, humic acid, cow urine and amritpani is becoming popular in farming system in general and vegetables in particular. In this context the exact scientific information on specific organic liquid organic manure to be used, stage of application and its concentration and its utility in increasing the growth parameters of vegetables is lacking. Hence, the present investigation is planned to study the effect of different organic growth promoters on growth of leafy vegetables.

MATERIAL AND METHODS

The experiment was laid out in randomized block design (RBD) with seven treatments replicated thrice. The varieties used for the experimentation was Amaranthus (Green leaves), Palak (All green) and for Methi (Local) was selected for study. The trail framed was intended to study the effect of vermiwash, panchgavya, humic acid, cow urine, amritpani combined with RDF alone and in combinations with different organic growth promoters on growth, yield and quality of leafy vegetables. The experiment consists of seven treatments vigorously, RDF (80:40:40 NPK kg/ha) (T_1), Vermiwash @ 5% (T_2), Panchgavya @ 3% (T_3), Humic acid @ 0.2% (T_4), Cow urine @ 5% (T_5), Amritpani @ 3% (T_6) and soil application of RDF + Vermiwash 5% + Panchgavya 3% + Humic acid 0.2% + Cow urine 5% + Amritpani 3% (T_7). The recommended dose of fertilizers 80:40:40 NPK kg/ha was applied to the plots of treatments

T_1 and T_7 of which 40 N kg/ha and full dose of P_2O_5 and K_2O was applied just before sowing, while, remaining 40 N kg/ha was given 15 days after sowing. The foliar application of organic growth promoters as per treatments was done at 15 and 21 days after sowing. The results obtained in respect of yield of leafy vegetables as influenced due to different treatments of organic growth promoters are summarized as below.

RESULT AND DISCUSSION

The results of the present investigation presented in Table 1 showed that, the fresh weight of whole plant and weight of roots were also significantly influenced due to combined application of inorganic fertilizers and different organic growth promoters.

Table 1 : Influence of plant growth promoters on yield parameters of leafy vegetables

Sr. No.	Treatments	Yield parameters														
		Fresh weight of whole plant (g)			Weight of root/plant (g)			Yield/plot (kg)			Yield/ha (q)			% increase over RDF		
		Amaranthus	Methi	Palak	Amaranthus	Methi	Palak	Amaranthus	Methi	Palak	Amaranthus	Methi	Palak	Amaranthus	Methi	Palak
T_1	RDF (80:40:40 NPK Kg/ha)	16.80	4.47	54.00	0.77	0.40	3.17	3.37	1.35	3.08	168.50	67.50	154.00	--	--	--
T_2	Vermiwash 5%	10.20	3.50	50.13	0.50	0.33	2.93	2.27	1.07	2.35	113.00	53.50	117.50	-32.94	-- 20.75	-23.71
T_3	Panchagavya 3%	7.53	2.73	46.40	0.40	0.30	2.50	1.87	0.80	1.58	93.53	40.00	79.00	-44.48	-40.75	-48.71
T_4	Humic acid 0.2%	12.77	3.63	51.30	0.60	0.37	3.10	2.63	1.24	2.38	131.50	62.00	119.00	-21.96	-8.15	-22.73
T_5	Cow urine 5%	6.93	2.43	34.67	0.37	0.27	2.40	1.27	0.68	1.52	63.50	34.00	76.00	-62.32	-50.37	-50.65
T_6	Amritpani 3%	6.90	2.33	27.27	0.25	0.17	2.01	1.13	0.60	1.17	56.50	30.00	58.50	-66.47	-55.56	-62.02
T_7	RDF + T_2 to T_6	17.50	4.57	61.47	0.83	0.50	3.43	4.03	1.65	3.50	201.50	82.50	175.00	19.58	22.22	13.63
	S.E. ±	0.57	0.16	2.46	0.10	0.07	0.27	0.12	0.15	0.22	6.00	7.50	11.00	--	--	--
	C.D. at 5%	1.77	0.52	7.58	0.32	0.22	0.84	0.37	0.48	0.68	18.5	24.00	34.00	--	--	--

The maximum (17.50 g) fresh weight of whole plant of Amaranthus was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with RDF treatment (T_1). In Methi maximum (4.57 g) fresh weight of whole plant of Methi was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with RDF (T_1) and maximum (61.47 g) fresh weight of whole plant of Palak was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with RDF treatment (T_1). The maximum (0.83 g) weight of root in Amaranthus was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3%

(T_7) and it was at par with treatment RDF (T_1) and humic acid 0.2% (T_4). This could be attributed due more height of the plant with more number of leaves and maximum leaf area, thus there was overall increase in vegetative growth thus there was increase in the fresh weight of the plant Bettoni *et al.* [2] also reported that, spraying onion plants with humic acid caused significant increase in photosynthesis which resulted in production of more fresh weight.

In Methi maximum (0.50 g) fresh weight of root was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with treatments RDF (T_1), humic acid 0.2% (T_4), vermiwash 5% (T_2) and panchagavya (T_3) and in Palak maximum (3.43 g) fresh weight of root was recorded with the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with treatment RDF (T_1) and humic acid 0.2% (T_4). This could be attributed to better root growth in the plants receiving the better nutrients needed for the growth of roots. However, the minimum fresh weight of root of Amaranthus (0.25 g) in Methi (0.17 g) and in Palak (2.01 g) was found with the application of Amritpani 3% (T_6). This may be due to lack of availability of nutrients at proper time required for the better development of roots. However, the perusal of the literature available fails to throw light on these findings.The highest yield per plot and per hactare of Amaranthus (4.03 kg and 201.50 q/ha) was recorded with soil application of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was followed by treatment RDF (T_1).

The highest yield per plot and per hectare of Methi (1.65 kg and 82.50 q/ha) was recorded with soil application of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with treatments of RDF (T_1) and humic acid (T_4). The highest yield per plot and per hactare of Palak (3.50 kg and 175.00 q/ha) was recorded with soil application of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7) and it was at par with treatment RDF (T_1). The highest (19.58%) increase in yield of Amaranthus, Methi (22.22%) and Palak (13.63%) was recorded with the treatment of soil application of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T_7). This could be attributed to the combined effect of inorganic nutrients and organic growth promoters which contains useful microorganisms, nitrogen, calcium, cytokinin, glucose, minerals etc. This might have triggered rapid cell division, proliferation and speedy growth and development of plants. Thus the plants grown with this treatment have produced maximum height, more number of leaves, higher leaf area resulting in production of high fresh weight of plant leading to production of more yield in this treatment. The results of present study are in accordance with those of Arjunan [1] and Gore and Sreenivasa [3] in tomato.

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