



## **Effect of Application different Organic Growth Promoters on quality and economics of Leafy Vegetables under Parbhani conditions**

**Kale N. S.,<sup>1</sup> Kalalbandi B. M.,<sup>2</sup> Garde A. P.<sup>3</sup> and Totewad P.G<sup>4</sup>**

Department of Horticulture,  
Vasantrao Naik Marathwada Krishi Vidyapeeth Parbhani  
Email: [angadg28@gmail.com](mailto:angadg28@gmail.com)

### **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. Regarding the influence of organic growth promoters on quality and economic parameters of leafy vegetables, it was observed that, the minimum physiological weight loss, maximum Vit. A content, shelf life with high values of gross, net monetary returns were recorded in the vegetables produced with the application of RDF + vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3%. However, the highest B: C ratio of Amaranthus (3.26), Methi (3.01) and Palak (1.81) was observed with the application of RDF (80:40:40 NPK kg/ha).*

**Keywords:** Amaranthus, Methi, Palak, Organic Growth Promoters, Quality, Economics

Received 20.07.2019

Revised 20.09.2019

Accepted 21. 10. 2019

### **INTRODUCTION**

Leafy vegetables are important items of commerce and thus can play a major role in the economic development. During the recent years, the interest in leafy vegetable production has increased rapidly as a result of greater appreciation towards their food value. Leafy vegetables are high yielding and provide nutritional security, more employment, more cash and foreign exchange [1]. High quality is major importance in all horticultural products particularly in leafy vegetables and somewhat more difficult to maintain because of the tender tissues and high surface to volume ratio. The quality traits of leafy vegetables include, colour, texture, size, shape, flavor and defects in addition to their nutritional value. The lack of knowledge especially on the nutritive value of leafy vegetables among the public in general is the main drawback in their production and consumption [5]. 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 quality of vegetables is lacking. Hence, the present investigation is planned to study the effect of different organic growth promoters on quality and economics 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<sub>1</sub>), Vermiwash @ 5% (T<sub>2</sub>), Panchgavya @ 3% (T<sub>3</sub>), Humic acid @ 0.2% (T<sub>4</sub>), Cow urine @ 5% (T<sub>5</sub>), Amritpani @ 3% (T<sub>6</sub>) and soil application of RDF + Vermiwash 5% + Panchgavya 3% + Humic acid 0.2% + Cow urine 5% + Amritpani

3% (T<sub>7</sub>). The recommended dose of fertilizers 80:40:40 NPK kg/ha was applied to the plots of treatments T<sub>1</sub> and T<sub>7</sub> of which 40 N kg/ha and full dose of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O 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 quality and economics of leafy vegetables as influenced due to different treatments of organic growth promoters are summarized as below.

## RESULT AND DISCUSSION

From Table 1, the minimum physiological loss of weight on 2, 3, 4 and 5 day in Amaranthus (3.67%, 7.32%, 11.33% and 22.33%) In Methi (2.33%, 7%, 8.67% and 20.67%) and in Palak (3.00%, 6.00%, 13.00% and 23.67%) respectively was observed with the treatments of RDF + vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T<sub>7</sub>) and it was maximum on 2, 3, 4 and 5 day in Amaranthus (10.67%, 14.33%, 19.33% and 32.33%), Methi (11.67%, 15%, 15.67% and 28.67%) and in Palak (8%, 20%, 25% and 35%) respectively with the treatment of RDF (T<sub>1</sub>). This could be attributed to less loss of water in the vegetables produced under the influence of this treatment. However, the perusal of the literature available fails to throw light on the findings on the aspects of the study.

**Table 1 : Influence of plant growth promoters on physiological weight loss of leafy vegetables**

Sr. No.	Treatments	Physiological weight loss (%)											
		Amaranthus (Days of storage)				Methi (Days of storage)				Palak (Days of storage)			
		2	3	4	5	2	3	4	5	2	3	4	5
T <sub>1</sub>	RDF (80:40:40 NPK Kg/ha)	10.67	14.33	19.33	32.33	11.67	15.00	15.67	28.67	8.00	20.00	25.00	35.00
T <sub>2</sub>	Vermiwash 5%	7.00	10.00	15.67	25.67	4.00	9.00	14.33	24.67	4.00	8.00	14.67	24.00
T <sub>3</sub>	Panchagavya 3%	6.00	9.00	13.67	23.67	6.00	8.67	14.00	24.00	4.33	9.00	14.00	24.00
T <sub>4</sub>	Humic acid 0.2%	4.67	8.33	13.33	23.33	3.67	7.33	12.33	22.33	3.33	9.33	13.67	26.00
T <sub>5</sub>	Cow urine 5%	4.00	7.33	12.33	31.33	5.33	8.67	12.67	22.67	4.33	12.67	17.67	28.00
T <sub>6</sub>	Amritpani 3%	4.67	8.00	12.30	23.00	7.00	10.33	10.67	25.67	5.67	10.33	15.00	25.67
T <sub>7</sub>	RDF + T <sub>2</sub> to T <sub>6</sub>	3.67	7.32	11.33	22.33	2.33	6.00	8.67	20.67	3.00	7.00	13.00	23.67

Table 2, Vit. A content the maximum Vit. A content in Amaranthus, Methi and Palak (8513.33, 3081.67 and 8973.33 IU/100 g) was recorded with the application of RDF + vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T<sub>7</sub>) and minimum Vit. A content in Amaranthus, Methi and Palak (7200, 2390 and 6203.33 IU/100 g) respectively with the application of RDF (T<sub>1</sub>). This might be due to effect of different organic growth promoters as they contain enzymes and minerals due to which the quality of these leafy vegetables was improved in general and Vit. A content in particular. The similar trend of results was observed by Amareswari and Sujathamma [2] in French bean. They reported that, the application of organic growth promoters increases the vitamin content of vegetables which supports present findings.

**Table 2 : Influence of plant growth promoters on quality of leafy vegetables**

Sr. No.	Treatments	Quality parameters					
		Vit. A (IU/100 g)			Shelf life (Days)		
		Amaranthus	Methi	Palak	Amaranthus	Methi	Palak
T <sub>1</sub>	RDF (80:40:40 NPK Kg/ha)	7200.00	2390.00	6203.33	2.33	2.27	2.67
T <sub>2</sub>	Vermiwash 5%	8286.67	2833.33	8913.33	3.33	2.67	4.33
T <sub>3</sub>	Panchagavya 3%	7553.33	2416.67	6853.33	2.67	3.00	3.00
T <sub>4</sub>	Humic acid 0.2%	7733.33	2555.67	7448.67	3.00	3.33	3.33
T <sub>5</sub>	Cow urine 5%	8126.67	2740.00	8663.33	3.67	3.00	4.00
T <sub>6</sub>	Amritpani 3%	7861.67	2546.67	7446.33	3.00	2.33	3.67
T <sub>7</sub>	RDF + T <sub>2</sub> to T <sub>6</sub>	8513.33	3081.67	8973.33	4.00	4.33	4.67
	S.E. ±	59.87	133.47	68.67	0.27	0.54	0.53
	C.D. at 5%	184.49	411.27	211.61	0.83	1.67	1.66

The maximum shelf life of Amaranthus, Methi and Palak (4, 4.33 and 4.67 days) respectively was recorded with the application of RDF + vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine

5% + amritpani 3% (T<sub>7</sub>) and minimum shelf life of Amaranthus, Methi and Palak (2.33, 2.27 and 2.67 days) respectively was observed with the application of RDF (T<sub>1</sub>). This may be due to favourable effects of combined use of growth promoters might have resulted in reducing weight loss as well as quality of the produce. However, the perusal of the literature available fails to throw light on the findings on the aspects of the study.

The lowest cost of cultivation for Amaranthus (Rs 45,437/ha), Methi (Rs 26,712/ha) and Palak (Rs 45,855/ha) was recorded in the treatment of cow urine 5% (T<sub>5</sub>) (Table 3). This could be attributed to as there was no expenditure on inorganic fertilizers and low cost of cow urine. The highest cost of cultivation for Amaranthus (Rs. 95,590/ha), Methi (Rs. 49,909/ha) and Palak (Rs. 88965/ha) was required in the treatment of soil application of RDF + foliar application of vermiwash 5% + panchagavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T<sub>7</sub>). The high cost of cultivation in this treatment could be due to cost of inorganic fertilizers and additional cost of organic growth promoters. The maximum gross and net monetary returns for Amaranthus (Rs. 3,02,205/ha, Rs. 2,06,915/ha), Methi (Rs 82,420/ha, Rs 32,510/ha) and Palak (Rs 2,62,755/ha, Rs 1,73,755/ha) were recorded in the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T<sub>7</sub>). This could be attributed to high yields obtained in this treatments. The maximum B: C ratio for Amaranthus (3.26), Methi (1.81) and Palak (3.01) was observed in the treatment RDF (T<sub>1</sub>), which was closely followed by the treatment of RDF + foliar spray of vermiwash 5% + panchgavya 3% + humic acid 0.2% + cow urine 5% + amritpani 3% (T<sub>7</sub>).

**Table 3 : Influence of plant growth promoters on economics of leafy vegetables**

Sr. No.	Treatments	Economics											
		Amaranthus				Methi				Palak			
		Cost of cultivation (Rs/ha)	Gross monetary returns (Rs/ha)	Net monetary returns (Rs/ha)	B: C ratio	Cost of cultivation (Rs/ha)	Gross monetary returns (Rs/ha)	Net monetary returns (Rs/ha)	B: C ratio	Cost of cultivation (Rs/ha)	Gross monetary returns (Rs/ha)	Net monetary returns (Rs/ha)	B: C ratio
T <sub>1</sub>	RDF (80:40:40 NPK Kg/ha)	78607	252495	173888	3.26	75067	231255	156187	3.01	37175	67500	30324	1.81
T <sub>2</sub>	Vermiwash 5%	61950	165000	103050	2.66	63825	176250	112425	2.76	32795	53670	20875	1.63
T <sub>3</sub>	Panchagavya 3%	56882	139995	83112	2.46	52342	118755	66412	2.26	29603	39920	10316	1.34
T <sub>4</sub>	Humic acid 0.2%	70517	197505	126987	2.80	67392	178755	111363	2.65	37346	62080	24733	1.66
T <sub>5</sub>	Cow urine 5%	45437	126870	81433	2.79	45855	114000	68145	2.48	26712	34170	7458	1.27
T <sub>6</sub>	Amritpani 3%	53480	78750	25270	1.47	51355	81255	29900	1.58	27430	30000	2570	1.09
T <sub>7</sub>	RDF + T <sub>2</sub> to T <sub>6</sub>	95590	302505	206915	3.15	88965	262755	173790	2.95	49909	82420	32510	1.65

The higher B: C ratio in the RDF treatment was due to comparatively less cost of cultivation and at par yields with promising treatment resulted in receiving the maximum B: C ratio. However, the quality improvement in the promising treatment could not be ignored. The lowest B: C ratio for Amaranthus (1.47), Methi (1.58) and Palak (1.09) was recorded with the application of amritpani 3% (T<sub>6</sub>). Among the different treatments of organic growth promoters application of humic acid @ 0.2% produced high B: C ratio (2.80) in Amaranthus and (1.66) in Palak. While, in Methi the application of vermiwash @ 5% produced high B: C ratio. Similar results have been reported by Fathima and Denesh [4] in chilli and Jadhav *et al.* [3] in Fenugreek, which supports the present findings.

## REFERENCES

1. Chadda, K. L. (2004). Hand book of horticulture. ICAR, Pub. New Delhi.
2. Amareswari, U. P. and Sujathamma, P. (2014). A study on the effect of different organic supplements on the ascorbic acid and riboflavin content of French bean (*Phaseolus vulgaris*). *Int. J. of Emerging Technologies in Computational and Applied Sci.*, **8**(3): 269-271.
3. Jadhav, P.B., Patil, N.B., Saravaiya, S.N., Dekhane, S.S., Tekale, G.S., Harad, N.B., Jadhav, K.P. and Patel, D.J. (2014). Effect of different level of vermiwash spray on growth and yield of fenugreek cv. local. *Int. J. of Development Research* **4**(8), pp. 1547-1549.

4. Fathima, P.S. and Denesh, G.R. (2013). Influence of humic acid spray on growth and yield of chilli (*Capsium annum* L.). *Int. J. of Agric. Sci.* **9**(2):542-546.
5. Mini, C. and Krishnakumary, K. (2007). Leaf vegetables. 2-23. Gupta, S. N. 2015. Instant Horticulture. 11th edition. *Jain brothers publication*, 71.

**CITATION OF THIS ARTICLE**

Kale N. S., Kalalbandi B. M., Garde A. P. and Totewad P.G. Effect Of Application Different Organic Growth Promoters On Growth Of Leafy Vegetables Under Parbhani Conditions *Bull. Env. Pharmacol. Life Sci.*, Vol 8 [11] October 2019: 106-109