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Research Paper

Effect of foliar spray of vermiwash and nutritional treatments on growth and yield performance of curry leaf var. SUVASINI

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ABSTRACT

A field trial was conducted during 2006-07 at Kittur Rani Channamma College of Horticulture, Arabhavi, Gokak (Tq.), Karnataka to study the nutritional treatments on the performance of curry leaf var. Suvasini. Foliar spray of vermiwash produced vigorous growth with significantly higher fresh leaf yield (13.07 t/ha) compared to control (11.13 t/ha). Among nutritional treatments, RDF + FYM (10.00 kg/plant) with vermiwash foliar spray at 50 per cent dilution recorded higher fresh leaf yield (17.74 t/ha) followed by FYM + RDF without vermiwash (15.79 t/ha) and FYM along with vermiwash (15.65 t/ha) compared to control (6.32 t/ha) in curry leaf var. Suvasini.

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Key words : Curry leaf, Farm yard manure, Vermiwash, Vermicompost, Yield

Curry leaf (*Murraya koenigii* Spreng) is one of the under-exploited species of Indian origin and its aromatic spicy leaves are used for flavouring of dishes and food stuffs. Foliar spray of nutrient solution and plant growth substances are one of the cultivation practices significantly influencing productivity of horticultural crops. Vermiwash obtained from earthworm bed contains many growth regulating substances (Nielson, 1965). Vermiwash is a very good foliar spray solution containing abundant beneficial microbes, *viz.*, heterotropic bacteria, fungi, actinomycetes including nitrogen fixers, phosphate solubulisers enriched with enzymes, hormones and vitamins (Shweta *et al.*, 2005). Beneficial effect of integration of organic manures, *viz.*, FYM and vermicompost with inorganic fertilisers is well established. Present study was undertaken to assess the response of curry leaf to foliar spray of vermiwash and nutritional treatments with particular reference to leaf yield and quality.

MATERIALS AND METHODS

A field experiment was conducted at Kittur Rani Channamma College of Horticulture, Arabhavi, Gokak (Tq.), Karnataka during 2006-07. Soil of the experimental plot was medium deep black with a pH of 7.8. Experiment was laid out as split plot design replicated thrice on curry leaf var. Suvasini planted in the year 2004. Main plot treatments included foliar spray of vermiwash (50%) (M_1) and control (no foliar spray) (M_2) and sub-plot treatments included RDF (300: 50: 50 g NPK/plant/year) (S_1), RDF + FYM @ 10 kg per plant (S_2), FYM @ 10 kg per plant alone (S_3), vermicompost @ two kg per plant (S_4) and control (no manures and fertilisers) (S_5). Recommended dose of fertilisers (300 : 50 : 50 g NPK/plant) was applied in four splits at three months intervals after each clipping. Full dose of phosphorus and potassium was applied as basal dose during the commencement of monsoon (*i.e.*, June 2006) (Anonymous, 2004). The plants were spaced at 3.0 x 1.5 m and were trained as individual bush at a prescribed height at 1.2 m. Observations were recorded on growth and yield attributes.

RESULTS AND DISCUSSION

Significant variation in growth attributes at 90 days after fourth clipping during June month was observed due to foliar spray of vermiwash at 50 per cent dilution and nutritional treatments (Table 1). The treatment sprayed with vermiwash (M_1) recorded higher plant height (170.77 cm), number of primary branches (6.84), crown size (1.27 cm) and leaf area of compound leaf (49.50 cm^2)

Table 1 : Growth attributes in curry leaf var. Suvasini as influenced by foliar spray of vermiwash and additional treatments during fourth clipping at 90 days after clipping

Treatments	Plant height (cm)			Number of primary branches per plant			Number of secondary branches per plant			Crown size (m)			Leaf area per compound leaf (cm^2)		
	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean
S_1	168.36	158.76	151.71	6.60	5.70	6.00	7.80	6.30	7.00	1.21	1.16	1.19	47.73	46.36	47.05
S_2	178.50	167.76	172.88	8.00	6.80	7.40	10.60	8.70	9.60	1.44	1.41	1.42	54.66	52.43	53.55
S_3	175.43	163.20	169.31	7.20	6.10	6.60	8.70	7.30	8.00	1.35	1.27	1.31	50.36	47.60	48.98
S_4	173.16	158.36	165.76	7.00	5.90	6.45	8.40	6.80	7.76	1.30	1.20	1.25	48.63	46.63	47.63
S_5	158.40	154.53	156.46	5.40	4.10	4.70	6.80	5.20	6.00	1.04	1.00	1.02	44.63	42.63	43.63
Mean	170.44	160.36		6.84	5.66		8.40	6.80		1.24	1.21		49.50	47.13	
For comparing the means of	S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)	
Main plot (V)	0.589	3.58		0.033	0.20		0.050	0.30		0.005	0.033		0.175	1.06	
Sub plot (S)	0.705	2.11		0.074	0.22		0.086	0.26		0.014	0.041		0.680	2.04	
S at same V	0.997	2.99		0.104	0.31		0.122	0.36		0.019	NS		0.961	2.88	
V at same or different S	1.06	3.20		0.099	0.30		0.120	0.36		0.020	NS		0.877	2.63	

Main plots (foliar spray): V_1 Foliar spray of vermiwash (50%) V_2 Control (no foliar spray)
Sub plots (Nutritional treatments): S_1 Recommended dose of fertiliser (RDF 300: 50: 50 g NPK/plant/year)
S_2 RDF + FYM (10 kg/plant) S_3 FYM (10 kg/plant) alone
S_4 Vermicompost (2 kg/plant) S_5 Control (no manures and fertilisers)

Table 2 : Effect of foliar spray of vermiwash and additional treatments on yield and yield attributes in curry leaf var. Suvasini

Treatments	Number of shoots per 0.25 m^2			Number of leaflets per compound leaf			Annual fresh leaf yield per plant (kg)			Yield per hectare (t)			B : C ratio		
	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean
S_1	17.30	11.73	13.05	20.00	19.90	19.95	5.14	4.42	4.78	11.42	9.46	10.44	2.59	2.17	2.38
S_2	21.26	17.53	19.40	21.10	21.56	21.33	8.00	6.95	7.47	17.74	15.79	16.76	3.07	2.60	2.83
S_3	17.36	12.43	14.90	20.50	19.73	20.11	6.60	5.76	6.18	15.65	12.36	14.01	2.96	2.23	2.59
S_4	15.80	11.40	13.60	21.50	20.26	20.88	5.96	5.23	5.60	13.26	11.71	12.48	2.87	2.48	2.67
S_5	10.53	8.56	9.55	19.50	19.43	19.61	3.27	2.92	3.09	7.26	6.32	6.79	2.79	1.57	2.18
Mean	15.86	12.33		20.52	20.23		5.49	5.05		13.07	11.13		2.86	2.21	
For comparing the means of	S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)		S.E.	C.D. (P 0.05)	
Main plot (V)	0.116	0.71		0.224	NS		0.052	0.32		0.213	1.30				
Sub plot (S)	0.457	1.34		0.415	1.24		0.111	0.33		0.361	1.08				
S at same V	0.633	1.90		0.586	NS		0.157	0.47		0.511	1.53				
V at same or different S	0.578	1.73		0.570	NS		0.149	0.45		0.504	1.51				

Main plots (foliar spray): V_1 Foliar spray of vermiwash (50%) V_2 Control (no foliar spray)
Sub plots (Nutritional treatments): S_1 Recommended dose of fertiliser (RDF 300 : 50 : 50 g NPK/plant/year)
S_2 RDF + FYM (10 kg/plant) S_3 FYM (10 kg/plant) alone
S_4 Vermicompost (2 kg/plant) S_5 Control (no manures and fertilisers)

compared to corresponding values of 160.36 cm, 5.66, 1.21 m and 47.13 cm^2 in control (M_2). Among sub-plots receiving nutritional treatments, RDF + FYM (S_2) recorded significantly higher plant height (172.88 cm), number of primary branches (7.40), crown size (1.42 m) and leaf area (53.55 cm^2) followed by FYM alone (S_3) (169.31 cm, 6.60, 1.31 m and 48.98 cm^2, respectively). Among interaction effects, RDF + FYM with foliar spray of vermiwash recorded significantly higher plant height (178.50 cm), number of primary branches (8.0) and secondary branches (8.7) followed by FYM with foliar spray of vermiwash (175.43 cm, 7.2 and 8.7, respectively).

Nutrient and growth promoting substances in vermiwash and RDF + FYM favoured the growth. The favourable conditions for growth due to the presence of growth promoting substances present in vermiwash was also reported by earlier workers in several crops (Karuna *et al*., 1999 in anthurium, Vijayananthan *et al*., 2004 in teak and casuarinas seedlings). Sengupta *et al*. (2000) reported in betelvine that supply of N at 200 kg per hectare through FYM and urea resulted in significantly higher growth performance.

Fresh leaf yield and yield attributes differed significantly due to foliar spray of vermiwash and nutritional treatments (Table 2). Foliar spray of vermiwash gave the highest annual fresh leaf yield per plant (5.79 kg) and per hectare (13.07 t) compared to control (5.05 kg/plant and 11.13 t/ha, respectively). Among nutritional treatments, RDF + FYM recorded the highest annual leaf yield per plant (7.47 kg) followed by FYM alone (6.18 kg/plant) compared to the lowest in control (3.09 kg/plant). Among the interaction, treatment receiving RDF + FYM along with foliar spray of vermiwash recorded the highest leaf yield (8.0 kg/plant) with a B : C ratio of 3.07 compared to the lowest recorded in control (3.09 kg/plant leaf yield and 1.57 of B : C ratio) without vermiwash.

Beneficial effects of FYM and inorganic fertilizers on soil properties like moisture retention, nutrient availability led to favourable condition for plant growth and development. Higher growth attributes resulted in better harnessing of solar energy to produce more carbohydrates, which in turn translocated leading to higher leaf yield. Similar results were obtained by foliar spray of vermiwash in paddy as reported by Thangavel *et al*. (2003) and in vegetable pea by Mahyto and Yadav (2005). Application of FYM (17.47 t/ha) along with RDF resulted in higher yield in ginger (17.16 t/ha) compared to RDF alone (Pawar and Patil, 1987).

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