

Short Communication

EFFECT OF SOIL AND FOLIAR APPLICATION OF ORGANIC NUTRIENTS ON YIELD AND QUALITY OF CUCUMBER CV. LONG GREEN

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Cucumber is one of the most important members of the family cucurbitaceae. It is one of the quickest maturing vine vegetable crop. The fruits are rich in vitamin B, vitamin-C and minerals like phosphorus, potassium, calcium and iron. The use of organic nutrients sources such as FYM, vermicompost, sea weed extract and panchakavya remains an alternative choice for the production of residue free wholesome produce. The organic farming practices assured balanced environment and quality food to our people. Hence the present study was conducted to find out the suitable combination of organic nutrients on yield and quality of cucumber CV. Long green.

The present investigation was carried out in the organic plot maintained at vegetable field unit of Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalai Nagar during two seasons VIZ. Season-I (July-September 2006) and season-II (January-March, 2007), under irrigated conditions. The field was laid out into beds of 1X1m size. The seeds of variety long green were sown in the centre of the beds by digging small pits. The experiment was laid out in randomized block design with 14 treatments. Each treatment was replicated thrice and four plants were maintained each for tender and matured fruits. The treatment comprised of FYM @ 25 t/ha, FYM @ 25 t/ha + panchakavya 3%, seaweed extract @ 25 kg/ha, seaweed extract @ 25 kg + panchakavya 3%, vermicompost @ 5 t/ha, vermicompost @ 5t/ha + panchakavya 3%, FYM @ 12.5t/ha + seaweed extract @ 25 kg/ha, FYM @ 12.5 t/ha + seaweed extract @ 25 kg/ha + panchakavya 3% FYM @ 12.5 t/ha + vermicompost @ 2.5 t/ha, FYM @ 12.5t/ha + vermicompost @ 2.5 t/ha + panchakavya 3 %, seaweed extract @ 25 kg/ha + vermi compost @ 2.5 t/ha, seaweed extract @ 25 kg/ha + vermicompost @ 2.5 t/ha + panchakavya 3%.

Each plot was applied with the respective dose of organic manures as basal application as per the treatment schedule. For treatment T₁₄, basal application of 80:50:50 kg NPK/ha was applied. The foliar application of nutrient solution was given at 15 days intervals. Observations were recorded on fruit yield per vine, TSS and ascorbic acid content. A hand refractometer was used for direct determination of the TSS content from the fresh juice extracted from the matured fruits and expressed in Brix. The ascorbic acid was estimated by A.O.A.C method (1975) from the matured and tender fruits and it is expressed in mg of ascorbic acid per 100 g of fresh sample.

The data on the effect of organic nutrients on the fruit yield per vine is presented in the table-1. In season-I, the maximum yield of both tender and matured fruits (710.70 and 6792.07 g) was registered in T₁₁, followed by T₁₄ (7022.53 and 6777.09 g) and T₃ (699.23 and 5462.43 g). The minimum yield of tender and matured fruits (453.60 and 3420.12 g) was observed in the control. (T₁). In season-II also, a similar trend was observed, with T₁₁ recording the highest yield of both tender and matured fruits (700.10 and 6765.04 g), while the treatment T₁₄ (692.83 and 6752.43 g), and T₃ (672.53 and 5432.22 g) proved to be the next best treatments. As in the case of season-I, the plants in T₁ (control) produced the lowest yield of both tender & matured fruits (430.34 and 3300.20 g respectively) when both seasons were compared. Season-I was found to be the best in producing the maximum yield of both tender and matured fruits than season II irrespective of the treatments. Rajagopal and Rao (1974) concluded that the increased nutrient availability from the organic manures might have increased the various endogenous hormonal levels in the plant tissue, which might be responsible for enhanced pollen germination and pollen tube growth, which ultimately increased the number of fruits per

Table 1. Effect of soil and foliar application of organic nutrients on fruit yield per vine (g) in cucumber cv. Long Green

Treatments	Season I		Season II	
	Tender fruit	Matured fruit	Tender fruit	Matured fruit
T ₁ - Absolute control	453.60	3420.12	430.34	3300.20
T ₂ - FYM @ 25 t ha ⁻¹	628.46	5130.10	618.10	5116.08
T ₃ - FYM @ 25 t ha ⁻¹ + panchakavya (PK) 3 %	694.23	5462.43	672.53	5432.22
T ₄ - Seaweed extract @ 25 kg ha ⁻¹	469.94	3860.08	452.32	3730.83
T ₅ - Seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	491.32	4030.10	480.45	3984.30
T ₆ - Vermicompost (VC) @ 5 t ha ⁻¹	553.72	4370.56	531.42	4320.10
T ₇ - VC @ 5 t ha ⁻¹ + PK 3 %	664.23	5192.81	627.71	5186.08
T ₈ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹	582.00	4692.42	565.53	4610.82
T ₉ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	600.93	5112.90	599.51	5100.18
T ₁₀ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹	682.31	5247.50	632.43	5200.50
T ₁₁ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3 %	710.70	6792.10	700.10	6765.04
T ₁₂ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹	525.38	4152.53	506.65	4110.12
T ₁₃ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3 %	646.00	5157.09	622.23	3157.09
T ₁₄ - RDF (80: 50: 50 kg NPK ha ⁻¹)	702.53	6777.09	692.83	6752.43
SED	17.62	46.63	18.07	48.76
CD(p=0.05)	35.24	93.27	36.15	95.52

RDF-Recommended dose of inorganic fertilizers alone

plant, resulting in higher yields. This is in line with the findings of Sendurkumaran *et al.* (1998) in tomato, Nanthakumar and Veeraragavathatham (1997) in brinjal.

In season I, T₃ registered the maximum total soluble solids (3.93 and 4.96° Brix) on both tender and matured fruits respectively. (Table -2) In season II also, the same treatments T₁, T₂ and T₇ registered the maximum total soluble solid (3.91 and 4.05; 3.80 and 3.95; 3.75 and 3.84° Brix) in both tender & matured fruits respectively. The control (T₁) registered the lowest total soluble solids of both tender and matured

fruits (3.15 and 3.30; 3.10 and 3.20° Brix) in both the seasons. While comparing the two seasons, season-I was found to record the maximum total soluble solids than season-II. The results on the effect of organic nutrients on the ascorbic acid content of fruits are presented in the table-3. In season-I, T₃ recorded maximum ascorbic acid content (8.28 and 8.55 mg/100g) in both tender and matured fruits respectively followed by T₂ (8.14 and 8.39 mg/100 g) and T₇ (7.99 and 8.23 mg/100g). A similar trend was observed in season-II also; with the treatment T₃ recorded the highest ascorbic acid content of 8.29 and 8.49 mg/

Table 2. Effect of soil and foliar application of organic nutrients on total soluble solids (°Brix) in cucumber cv. Long Green

Treatments	Season I		Season II	
	Tender fruit	Matured fruit	Tender fruit	Matured fruit
T ₁ - Absolute control	3.15	3.30	3.10	3.20
T ₂ - FYM @ 25 t ha ⁻¹	3.82	4.08	3.80	3.95
T ₃ - FYM @ 25 t ha ⁻¹ + panchakavya (PK) 3 %	3.93	4.96	3.91	4.05
T ₄ - Seaweed extract @ 25 kg ha ⁻¹	3.12	3.36	3.13	3.37
T ₅ - Seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	3.19	3.31	3.20	3.32
T ₆ - Vermicompost (VC) @ 5 t ha ⁻¹	3.27	3.47	3.28	3.49
T ₇ - VC @ 5 t ha ⁻¹ + PK 3 %	3.74	3.86	3.75	3.84
T ₈ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹	3.30	3.41	3.31	3.42
T ₉ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	3.63	3.76	3.62	3.79
T ₁₀ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹	3.34	3.57	3.37	3.59
T ₁₁ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3 %	3.52	3.71	3.53	3.72
T ₁₂ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹	3.48	3.53	3.49	3.54
T ₁₃ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3 %	3.57	3.63	3.59	3.64
T ₁₄ - RDF (80: 50: 50 kg NPK ha ⁻¹)	3.44	3.65	3.46	3.69
SED	0.04	0.11	0.05	0.05
CD(p=0.05)	0.08	0.22	0.82	0.10

RDF-Recommended dose of inorganic fertilizers alone

Table 3. Effect of soil and foliar application of organic nutrients on ascorbic acid content (mg 100 g⁻¹) in cucumber cv. Long Green

Treatments	Season I		Season II	
	Tender fruit	Matured fruit	Tender fruit	Matured fruit
T ₁ - Absolute control	7.04	7.11	7.02	7.08
T ₂ - FYM @ 25 t ha ⁻¹	8.14	8.39	8.13	8.34
T ₃ - FYM @ 25 t ha ⁻¹ + panchakavya (PK) 3 %	8.28	8.55	8.29	8.49
T ₄ - Seaweed extract @ 25 kg ha ⁻¹	7.16	7.19	7.17	7.20
T ₅ - Seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	7.26	7.29	7.29	7.30
T ₆ - Vermicompost (VC) @ 5 t ha ⁻¹	7.34	7.37	7.36	7.39
T ₇ - VC @ 5 t ha ⁻¹ + PK 3 %	7.99	8.23	7.98	8.19
T ₈ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹	7.41	7.43	7.42	7.45
T ₉ - FYM @ 12.5 t ha ⁻¹ + seaweed extract @ 25 kg ha ⁻¹ + PK 3 %	7.86	7.92	7.87	7.98
T ₁₀ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹	7.45	7.46	7.47	7.49
T ₁₁ - FYM @ 12.5 t ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3 %	7.65	7.80	7.67	7.82
T ₁₂ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹	7.53	7.56	7.52	7.58
T ₁₃ - Seaweed extract @ 25 kg ha ⁻¹ + VC @ 2.5 t ha ⁻¹ + PK 3%	7.62	7.65	7.62	7.68
T ₁₄ - RDF (80: 50: 50 kg NPK ha ⁻¹)	7.57	7.62	7.54	7.64
SED	0.07	0.08	0.06	0.07
CD(p=0.05)	0.14	0.16	0.13	0.15

RDF-Recommended dose of inorganic fertilizers alone

100g in both tender and matured fruits respectively. T₁ (control) registered the lowest ascorbic acid content of 7.04 and 7.11 mg /100 g and 7.02 and 7.08 mg/ 100 g in both tender and matured fruits in both season respectively. Irrespective of the treatments, the fruits produced in season-I recorded the highest ascorbic acid content than season-II.

Application of organic forms of manure showed a definite advantage in improving the quality of fruits over the inorganic fertilizers. Fruits obtained from FYM treated plots showed maximum content of ascorbic acid and total soluble solids compared to other organic manures like vermicompost or poultry manures. (Kansal *et al.*, 1981). The results of the present study which envisaged increased quality attributes due to organic manures is in agreement with the findings of Prabakaran and James Pitchai (2003).

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