



# INFLUENCE OF ORGANIC NUTRIENTS WITH SPRAYING OF FOLIAR ORGANICS ON YIELD PARAMETERS OF SINDIL KODI (*TINOSPORA CORDIFOLIA*)

S. Sivasankar, K. Manivannan, R. Sureshkumar, R. Sendhilnathan and M. Rajkumar

Department of Horticulture, Faculty of Agriculture, Annamalai University,  
Annamalainagar – 608 002 (Tamilnadu) India.

## Abstract

The present investigation was carried out to study the influence of organic nutrients with spraying of foliar organics on yield parameters of sindil kodi. A field trial was conducted in a randomized block design with soil application of organic manures (Farm yard manure 12.5 t ha<sup>-1</sup> and Biodynamic compost 5 t ha<sup>-1</sup>) and foliar application of different organic nutrients (Vermi wash 3 percent, Panchakavya 3 percent, and sea weed extract 1 percent). The results of the present study revealed that soil application of biodynamic compost 5 t ha<sup>-1</sup> with foliar application of vermiwash 3 percent was found to be highest values registered in yield attributing characters of Immature stem yield, mature stem yield, 100 fruit weight, 100 seed weight, dry weight of 100g stem and powder recovery from dried stem in guduchi.

**Key words:** Guduchi, Biodynamic compost, Mature stem, sea weed extract.

## Introduction

*Tinospora cordifolia* which is commonly known as Guduchi, Gulancha *Tinospora*, in ayurvedic name of this plant Amrita and Gurcha in hindi, sindilkodi in tamil. it is a native plant from tropical and subtropical regions of India. Also known to be found in far East, primarily in rainforests. The plant is said to climb over the highest trees and throw out aerial roots, which reach the length of 30 feet. It is a perennial deciduous twiner with succulent stem and the bark is gray or creamy-white in color It can grow well in almost all type of soils under varying climatic conditions. The plant is cultivated by stem cuttings in the month of May-June. It requires some support preferably neem and mango trees, supposed to possess better medicinal values. A large number of compounds have been isolated from the aerial parts and roots of *Tinospora cordifolia*. The major isolated compounds are cordiofolisides, tinocordifolin, tinocordifolioside, tinosponone and tinocordioside were identified as the active principles with anticomplement and immunomodulatory activities. It has been shown that the stem of the plant contain the alkaloid tinosporine. The herb has a long history in use by practitioners of ayurvedic medicine (the traditional medicine of India). Since 200 BC, known by its

practitioners to treat convalescence from severe arthritis or joint diseases, urinary problems, and diabetes. Also, help to remove toxins from the body. In this situation higher need of this crop based natural medicine for all humans because of present lifestyle and food habits. Being a medicinal crop organically produced plant give higher yield and quality alkaloids. Use of organics for increasing the production is emphasized, because continuous use of chemical fertilizers has led to several hazards in soil by heavy withdrawal of nutrients (Prasad and Singh, 1980) causing deficiency of micronutrient, nutrient imbalance (Singh and Turkhede, 1983) and ultimately resulting in the reduction of crop yield. Hence, there is an imperative need to standardize the optimum quantity of organic manures and accurate level of foliar organics in *Tinospora cordifolia* for better vegetative growth and yield.

## Materials and Methods

The present experiment was carried out in the Orchard Department of Horticulture, Faculty of Agriculture, Annamalai University for NMPB project during 2006. Healthy Hard wood cuttings of *Tinospora cordifolia* were collected from the in and around area of sirkali taluk, Nagappattinam district. The cuttings were

**Treatment details**

T <sub>1</sub>	- FYM @ 12.5 t ha <sup>-1</sup>
T <sub>2</sub>	- Biodynamic compost 5 t ha <sup>-1</sup>
T <sub>3</sub>	- Vermiwash 3%
T <sub>4</sub>	- Panchakavya 3%
T <sub>5</sub>	- Seaweed extract 1%
T <sub>6</sub>	- FYM @ 12.5 t ha <sup>-1</sup> + Vermiwash 3%
T <sub>7</sub>	- FYM @ 12.5 t ha <sup>-1</sup> + Panchakavya 3%
T <sub>8</sub>	- FYM @ 12.5 t ha <sup>-1</sup> + Seaweed extract 1%
T <sub>9</sub>	- Biodynamic compost 5 t ha <sup>-1</sup> + Vermiwash 3%
T <sub>10</sub>	- Biodynamic compost 5 t ha <sup>-1</sup> + Panchakavya 3%
T <sub>11</sub>	- Biodynamic compost 5 t ha <sup>-1</sup> + Seaweed extract 1%
T <sub>12</sub>	- Control

planted in the polybags containing the pot mixture and after rooting, they were planted in the main field.

The experiment was laid out in randomized block design with three replications with twelve treatments. Regular cultural practices were adopted to raise the crop successfully. Observations were recorded at every thirty days interval with five tagged plants on the Immature stem yield, mature stem yield, 100 fruit weight, 100 seed weight, dry weight of 100g stem and powder recovery from dried stem. The treatment details are as follows.

**Results and Discussion**

In the present study, the influence of organic nutrients with spraying of foliar organics on growth parameters of sindil kodi are presented in the Table 1. The maximum immature stem yield plant<sup>-1</sup> (138.47g), mature stem yield plant<sup>-1</sup> (467.48g), 100 fruit weight (57.42g), 100 seed

weight (9.57g) dry weight of 100g stem (46.34g) and powder recovery 100g stem (36.84g), were registered in soil application of biodynamic compost 5tha<sup>-1</sup> with foliar spraying of vermiwash 3% (T<sub>9</sub>), it was followed by application of biodynamic compost 5tha<sup>-1</sup> with foliar spraying of sea weed extract 1% (T<sub>11</sub>) immature stem yield plant<sup>-1</sup> (129.62g) mature stem yield plant<sup>-1</sup> (440.65g), 100 fruit weight (54.70g), 100 seed weight (8.86g) dry weight of 100g stem (43.96g) and powder recovery 100g stem (34.83g), the minimum immature stem yield plant<sup>-1</sup> (56.32g), mature stem yield plant<sup>-1</sup> (218.56g), 100 fruit weight (32.18g), 100 seed weight (3.02g) dry weight of 100g stem (24.33g) and powder recovery of 100g stem (18.42g), were registered with control (T<sub>12</sub>).

The increased trend with respect to yield parameters observed with treatment of soil application of biodynamic compost 5tha<sup>-1</sup> with foliar spraying of vermiwash 3% in *Tinospora* might be due to increased availability of macro and micronutrients from FYM and vermiwash that combined with major nutrients which in turn helped for the development of efficient photosynthetic system. Further this might be due to the presence of humus forming microbes and growth regulators in vermicompost (Bano *et al.*, 1987) which helped in better growth of crops. The present results are in concomitant with Somanath *et al.*, (2005) in *Coleus*. The reason for higher yield under combined nutrient management may be due to foliar nutrients, especially vermiwash augmented by addition of organic nutrient throughout the growth period (Ayanaba and Okigbo, 1974). Similar findings were made by (Gupta *et al.*, 2013).

**Table 1:** Influence of organic nutrients with spraying of foliar organics on yield parameters of *Tinospora cordifolia*

Treatments	Immature stem yield plant <sup>-1</sup> (g)90DAP	Mature stem (g)90DAP yield plant <sup>-1</sup>	100 fruit weight (g) 90DAP
T1-FYM @ 12.5 t ha <sup>-1</sup>	90.73	321.78	42.43
T2-Biodynamic compost 5 t ha <sup>-1</sup>	92.11	326.68	43.07
T3-Vermiwash 3%	82.92	298.82	40.25
T4-Panchakavya 3%	73.02	268.13	36.99
T5-Seaweed extract 1%	81.70	294.40	39.65
T6-FYM @ 12.5 t ha <sup>-1</sup> + Vermiwash 3%	111.36	385.34	49.09
T7-FYM @ 12.5 t ha <sup>-1</sup> + Panchakavya 3%	101.79	356.02	46.05
T8-FYM @ 12.5 t ha <sup>-1</sup> + Seaweed extract 1%	102.51	358.51	46.37
T9-Biodynamic compost 5 t ha <sup>-1</sup> + Vermiwash 3%	138.47	467.48	57.42
T10-Biodynamic compost 5 t ha <sup>-1</sup> + Panchakavya 3%	120.67	413.55	51.95
T11-Biodynamic compost 5 t ha <sup>-1</sup> + Seaweed extract 1%	129.62	440.65	54.70
T12-Control	56.32	218.56	32.18
S.Ed	3.62	10.96	1.12
CD (p = 0.05)	7.48	22.68	2.31

\* - Days after planting, SA – soil application, FS – Foliar spray

**Table 2:** Influence of organic nutrients with spraying of foliar organics on yield parameters of *Tinospora cordifolia*

Treatments	100 seed weight (g)90DAP	Dry weight of 100g Stem (g)90DAP	powder recovery of 100g stem (g)90DAP
T1-FYM @ 12.5 t ha <sup>-1</sup>	5.80	33.35	26.01
T2-Biodynamic compost 5 t ha <sup>-1</sup>	5.88	33.86	26.41
T3-Vermiwash 3%	5.15	31.39	24.35
T4-Panchakavya 3%	4.38	28.62	22.04
T5-Seaweed extract 1%	5.08	30.93	23.98
T6-FYM @ 12.5 t ha <sup>-1</sup> + Vermiwash 3%	7.41	39.08	30.76
T7-FYM @ 12.5 t ha <sup>-1</sup> + Panchakavya 3%	6.56	36.45	28.57
T8-FYM @ 12.5 t ha <sup>-1</sup> + Seaweed extract 1%	6.70	36.71	28.79
T9-Biodynamic compost 5 t ha <sup>-1</sup> + Vermiwash 3%	9.57	46.34	36.84
T10-Biodynamic compost 5 t ha <sup>-1</sup> + Panchakavya 3%	8.15	41.57	32.85
T11-Biodynamic compost 5 t ha <sup>-1</sup> + Seaweed extract 1%	8.86	43.96	34.83
T12-Control	3.02	24.33	18.42
S.Ed	0.29	0.97	0.81
CD (p=0.05)	0.61	2.01	1.72

\* - Days after planting, SA – soil application, FS – Foliar spray

### Conclusion

The findings of this investigation clearly brought out that soil application of biodynamic compost 5t ha<sup>-1</sup> with foliar spraying of vermiwash 3% was found to be optimum for increasing the Immature stem yield, mature stem yield, 100 fruit weight, 100 seed weight, dry weight of 100g stem and powder recovery from 100g dried stem in *Tinospora cordifolia*.

### References

- Ayanaba, A. and B.N. Okigbo (1974). Mulching for improved soil fertility and crop production. In: FAO Bulletin 27, on organic materials as fertilizer; Food and Agriculture. Pp. 97-119
- Bano, K., R.D. Kale and G.G. Gajanan (1987), Culturing earth worms *Eurilulus euginae* for the cast production and

assessment of worm cast as biofertilizer. *Indian Soil Biol. and Ecol.*, **7**: 98–104.

- Gupta, L.M., Sandeep kumar, Meenakshi Gupta and Vikas Sharma (2013). Integrated nutrient management for growth and yield in Glory lily (*Gloriosa superba* L.). *J. Med. Plants Res.*, **7**: 3197-3201.
- Somanath, S., S. Bhaskar and C.A. Sreenivasasmurthy (2005). Influence of FYM, inorganic fertilizer (NPK) and source of potassium on the yield of *Coleus forskholii*. *J. Med. Arom. Plants Sci.*, **27**: 16-19.
- Prasad, B. and A.P. Singh (1980). Changes in soil properties with long term use of fertilizer, lime and FYM. *J. Indian Soc. Soil Sci.*, **28(4)**: 465 468.
- Singh, R. and B.B. Turkhede (1983). Studies on N and P requirement of opium poppy with and without farmyard manure. *Indian. J. Agron.*, **27(1)**: 88-91.