NUTRIENT SOURCE COMBINATIONS ON YIELD AND NUTRIENT CONTENTS OF FOETID CASSIA (CASSIA TORA) UNDER OPEN AND SHADED CONDITIONS

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ABSTRACT

The performance of Cassia tora or foetid cassia in open and shaded conditions when supplied with various organic and inorganic nutrient sources was studied. Though there was no significant difference in yields under open conditions, under shaded conditions, significantly higher yields were obtained with the application of vermicompost. High contents of nitrogen and calcium were recorded in the leaves of Cassia tora. In open conditions, N content was higher when FYM was applied alone, while P and K contents were observed to be significantly higher when organic and inorganic sources were combined. Significantly higher Ca, Mg, S and Mn contents were also observed in shaded conditions. High Ca and micronutrient contents of the plant pointed out to its potential to overcome various nutrient deficiencies in the human diet.

Key words: Cassia tora, Nutrient management.

Cassia tora or foetid cassia is a mucilaginous legume with foetid smelling leaves. Commonly seen in the monsoon season in the homesteads of Kerala, the tender leaves of this plant were used as a vegetable in earlier times. The plant is also reported to possess medicinal qualities and is effective in treating ringworm (Singh and Panda, 2005). Underexploited plant species like Cassia tora are identified to be promising sources of minerals and vitamins. An investigation was undertaken to study the performance of the plant in open and shaded conditions when supplied with various organic and inorganic nutrient sources. The results are presented here.

Seedlings of Cassia tora were collected from wild growth with the onset of the south west monsoon in the beginning of June 2009. They were planted in two situations: in open conditions and as intercrops in coconut. Nutrients were supplied through various organic and inorganic manures as detailed below:

T1 - Control (no manures)
T2 - Farmyard manure (FYM), 10 t ha⁻¹
T3 - Vermicompost supplying N equivalent to 10 t FYM ha⁻¹
T4 - FYM, 10 t ha⁻¹ + 50:25:50 kg N,P,K ha⁻¹
T5 - Vermicompost + 50:25:50 kg N,P,K ha⁻¹

The experiment was laid out in randomized block design (RBD) with five replications. The plants were harvested twice, with leafy shoots cut and removed and yields recorded. Total yield data (of two harvests) are presented in Table 1.

The results showed that there was no significant difference in yields under open conditions, but under shaded conditions, significantly higher yields were obtained with the application of vermicompost (T3). Higher vegetative yields have also been reported in Amaranthus with application of vermicompost than with fertilizers (Uma and Malathi, 2009). Vermicompost has been reported to enhance the activity of beneficial microbes like N fixers and colonization by mycorrhizal fungi and hence play a significant role in N fixation and phosphate mobilization leading to better uptake by the plant, and consequent better growth and yield (Kale et al., 1992). Contents of major and minor nutrients were analysed in the leaves and are presented in Tables 2 and 3. High contents of nitrogen and calcium in the leaves of Cassia tora indicated that it was a promising source of protein and calcium.

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Treatments produced significant variation in nutrient contents in open conditions. N content was higher when FYM was applied alone, while P and K contents were seen to be significantly higher when organic and inorganic sources were combined (T4). Interestingly, higher P and K contents were obtained when no manures were applied under shaded conditions. Significantly higher Ca, Mg, S and Mn contents were also observed in shaded conditions. However, in open conditions, treatments T3 and T4 produced significantly higher contents of Ca, Mg, Fe, Mn and Cu. Increased N, P, K, Ca and Mg concentrations have been observed in leaf blades of shaded field grown cotton as compared to those of unshaded control plants (Zhao and Oosterhuis, 1998). Similarly, crude protein percentage was found to increase in shade grown forages as compared to those grown in full sun (Lin et al., 2001).

Comparing the two situations, higher contents of P, K, Ca, S, Zn, Fe and Mn were seen under shaded conditions. However, N content was higher under open conditions. Screening of genetic resources of the medicinal and vegetable plant Centella asiatica collected from different parts of India revealed that 50 per cent shading of plants resulted in higher yields of herbage and asiaticoside (Mathur et al., 2000). Devadas and Chandini (2000) reported that better expression of growth characters and response to nutrients was obtained in bush pepper (Piper nigrum) plants under 50 per cent light intensity.

Enhanced nutrient contents (especially of calcium) of plants under shaded conditions indicate the nutritive potential of such underexploited plant species growing naturally in the homesteads of...
Kerala. Such plants could play an important role in overcoming multiple micronutrient deficiencies of iron and vitamin A which continue to be of public health significance. Hence the promotion of such plants under organic nutrition practices would be a positive step towards food security and nutritional security.

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REFERENCES