

Introduction

Low productivity (6.5t/ha) and low profitability in mango is one of the important drawbacks in its production in India. Mainly small farmers cultivate the 1.3 m hectare mango in the country spread amongst 0.6m farm holdings. Widespread micronutrient disorders are (Edward Raja et al 2005) one of the causes for low productivity. Zinc, Iron, Manganese and boron deficiencies have been recorded in semi arid mango region. About 85-90% of the mango orchards are rain fed, and due to low profitability improved practices like drip irrigation, fertigation, use of chelated iron are yet to become popular. Hence to correct the micronutrient disorders, sustainable low cost technologies (LEISA-Low External Input Sustainable Agriculture) are needed. India is abundant in supply of neem (*Azadiracta Indica*) seed cake, which has the capacity to inhibit the nitrification and enhance N use efficiency. Mishra et al (1975) have established neem seed cake as a nitrification inhibitor in a laboratory experiment. Besides the NH₄-N dominant nitrogen nutrition (Haynes and Goh 1978) resulted in rhizosphere acidification (Riley and Barber, 1971) which resulted in mobilization of soil micronutrients in available form. This is a viable low cost technology since supply of micronutrients externally by soil or foliar spray is not viable for mango farmers of India. Hence a field experiment was conducted to evaluate the effect of neem cake with a ammonia cal nitrogen fertilizer source on micronutrient deficiency correction in mango in cultivars Alphonso and Banganpalli, two premium commercial cultivars of India.

Neem Cake Decoction: A suspension of 5% neem cake (NC) with 1% ammonium sulphate was soaked overnight and this was drenched in the active root zone of the mango trees 10 years old in an alfisol of pH 7.3 (DTPA Zn,0.55mg/kg, Fe 4.8 mg/kg, B 0.42 mg/ kg) At 10 litres/drenching three drenching were done in October, November and December (pre blossom and blossom period) for 2 years 2005 and 2006. The treatments were replicated 8 times and RBD was the statistical design followed. The soil was monitored for micro nutrient status and before drenching 6 months after drenching and leaf was monitored for the micronutrient status both before and 6 months after drenching.

Results and Discussion:

Table-1 Effect of neem cake decoction on micronutrient deficiency correction in mango.

| Mango Variety | Soil pH Soil available micronutrients | | | | | Leaf nutrients status (mg/kg) | | | | | |
|-----------------------|---------------------------------------|-----------------------|--|--------------|----------------|---|----|----|--|----|----|
| | Before drench | 180 days after drench | DTPA Extractable nutrients after drenching Zn Fe B ← mg/kg → | | | Before drenching Zn Fe B | | | 6 months after drench Zn Fe B | | |
| Alphonso I year | 7.3 | 6.2 | 0.72 (0.55) | 6.2 (4.8) | 0.46 (0.43) | 12 | 30 | 14 | 17 | 48 | 17 |
| II year | 7.2 | 6.0 | 0.84 | 7.4 | 0.54 | 14 | 30 | 16 | 26 | 52 | 18 |
| Banganpalli I year | 7.3 | 6.0 | 0.74 | 6.8 | 0.63 | 16 | 42 | 17 | 22 | 52 | 22 |
| II year | 7.3 | 5.8 | 0.96 | 8.2 | 0.68 | 17 | 44 | 18 | 30 | 58 | 24 |

(Values in parenthesis indicate the nutrients in untreated control)

The results indicate there is significant increase in available Zn, Fe in the first year of drenching with Neem Cake decoction. From a no treated control value of 0.55 mg/kg Zn is increased to 0.72 mg/kg in the first year (an increase of 30 percent to 0.84 mg/kg an increase of 52 percent in second year that is very significant in the cultivars Alphonso. But available Fe also recorded a more significant increase (DTPA extractable) than Zn due to neem cake decoction treatment. The available B (hot water soluble) B is not significantly in the first year but it increased substantially in the II year in Alphonso. In the leaf Zn, also the increase is less in I year but substantial in the II year in Cv-Alphonso. But in cultivar Banganpalli, for Zn, Fe and B, the increase is substantial in the first and noticeable in the II year. This increase in soil available micronutrients (Marschner and Romheld 1983) and corresponding increase in leaf nutrients confirms (Nye 1981) the effect of NH₄-N by nitrification inhibition. It has opened this possibility of using this low cost technology, which is sustainable. Since the neem cake is available in plenty in India and ammonium sulphate is easily available, this has opened the possibility of widespread micronutrient correction at low cost

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