



MICROSOL - A CROP YIELD BOOSTER

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The world population is expected to reach 9.8 billion by 2050 and that of India will be around 1.67 billion. To feed this burgeoning population, agriculture has to be more sustainable, giving prime importance to increasing crop production with reduced exploitation of soil resources. So, integrated nutrient management has to be focussed on using agriculture inputs more efficiently for maximum production.

In the post Green revolution era, reports on multi nutrient deficiencies in the Indian soils have showed an increasing trend. Intensive agriculture, increased nutrient demand by the high yielding crops and varieties grown in unit area of land, reduced use of organic manures, and indiscriminate use of straight fertilizers has contributed to the increased micronutrient deficiencies in Indian soils.

The soils of Kerala are acidic in reaction having low activity clay, often gravelly with low water and nutrient retention capacity. The base depleted soils are relatively infertile requiring careful management to achieve satisfactory crop yields (Rajasekharan et al., 2014).

MICRONUTRIENT DEFICIENCIES IN INDIA

Shukla et al. (2021) reported wide spread deficiencies of micronutrients of varying degrees were found in 51.2% of Indian soils with respect to zinc, 44.7% in case of boron, 19.2% in iron, 11.4% in copper and 17.4% in manganese after analyzing 2,42,827 surface soil samples (0–15 cm depth) collected from 615 districts of 28 Indian states. Considering the increasing trend of micronutrient deficiencies in the country and in the state, College of Agriculture, Padannakkad, the Kerala Agricultural University campus located in the Kasaragod District, developed a ready to use foliar micronutrient mixture MICRO-SOL (Figure 1).



Figure 1. The multi-nutrient formulation MICROSOL



MICROSOL

The micronutrient mixture MICRO-SOL contains iron (1%), manganese (0.05%), zinc (5%) and copper (2%), boric acid (1%), ammonium molybdate (0.05%) and organic acid (1%). Microsol has the potential for enhancing the crop yield by correcting the widespread micronutrient deficiencies. The foliar nutrition of this standardized formulation provides balanced nutrition of essential micronutrients to the crop leaves rapidly and get immediately translocated throughout the plant. Microsol application is found to be very efficient in drastically improving the crop yield in various crops.

MICROSOL APPLICATION IN PULSE CROP

John et al. (2022) reported enhanced pod weight and grain yield in pulse crop cowpea (*Vigna unguiculata* L. Walp) with application of microsol (2% solution) as seed treatment followed by two foliar sprays of 2% at 15 and 30 days after sowing.

MICROSOL APPLICATION IN VEGETABLE

Studies on the response of bhindi (*Abelmoschus esculentus* L. Moench) to fertigation and foliar nutrition with 2% microsol in red loam soil of Kasaragod district (Ashwini, 2018) recorded 10% yield increase. Various farm trials showed that application of microsol (2%) at the rate of 10 mL/L at 15 days after planting and 15 mL/L at 30 days after planting could enhance the yield and quality parameters in bhindi and reduced the incidence of yellow vein mosaic disease.

Results of farm trials carried out in chilli and brinjal crops with application of 2% microsol @ 10 mL/L at 15 days after planting, 15 mL/L at 30 days after planting and 20mL/L at 45 days after planting improved the yield (31%) and crop quality.

MICROSOL APPLICATION IN BANANA

Studies of Premalatha (2016) in tissue culture Nendran banana gave promising results with foliar spraying of micronutrient mixture (3%) at second, fourth and sixth month after planting. A bunch weight of up to 12.76 Kg was obtained in the micronutrient applied plants along with highest average weight of fingers and finger length as against 8.32 Kg in the non-treated plants. Microsol application in banana carried out in the farmer's fields of 50 locations of Northern Kerala also reported very good results with a yield increase up to 36.7%.

SUCCESS STORIES

Microsol application in banana (var. Nendran) grown in boron and zinc deficient northern laterite soils of Kasaragod, has resulted a yield increase from 3.48 to 4.7kg along with helping banana plants to resist Kokkan disease (banana bract mosaic disease caused by Banana bract mosaic virus (BBrMV)). After foliar application of microsol the affected plants revived and developed new leaves (Figure 2).



Figure 2. (a) Banana plant infected with Kokkan disease (b) revived with Microsol application



Front line demonstration conducted by ICAR-Central Plantation Crop Research Institute, Kasaragod, in the banana crop, in the farmer fields at Panayal in an area of 0.4 Ha has also showed that foliar application of micronutrients was beneficial and economical. Bunch yield, average number of fingers, average length of fingers, and average girth of fingers was higher in micronutrient applied plants. Bunch weight in banana plants applied micronutrient was 313 q ha⁻¹ and that of micronutrient non-applied plants was 267.5 q ha⁻¹ (Figure 3).



Figure 3. Bunch of banana crop with the use of MICROSOL

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