

12 May 2008

Mr Dipak Suchde, CEO - Malpaani Trust  
Krishi Tirth, Village Bajwada,  
Post Nemawar, Pin 455339  
Taluka Khategaon, District Dewas, MP

**Subject:** *Some comments on analysis report of the soil samples collected from Krishi Tirth, Malpani Trust, Bajwada in Sept 2007.*

Dear Mr Suchde,

The attached file has four data tables, one each having soil chemical, soil biological and soil microbiological properties and fourth on micro-nutrients. This report pertains to the soil samples collected on 19 Sept 2007. Analysis was done within 60 days after sampling. Widely used methods were followed for the different types of parameters. Data on the different parameters are in the attached data tables. Comments/highlights on the analysis report/data obtained on the different parameters are given below.

It may be noted that the unplanted area of about one acre of your farm was used as reference or control and is stated as 'Original soil' in the three data tables.

**Soil chemical parameters, Table 1:** (a) fertility of the original soil was lower than the area under cultivation; (b) fertility was maximum below (15 cm) the heap indicating that roots from plants sown on heaps will tend to go deep in the soil to explore/take-up the nutrients; (c) organic carbon percent (OC%) below heap was at least 3 times more than that in the heap itself, indicating that smaller carbonaceous molecules of degrading biomass move down from heaps with water (rain or irrigation).

**Micronutrients analyses, Table 2:** Only five of the ten micro-nutrients, reported in published literature as deficient in farmers' fields were analyzed. Salient comments follow: (a) quantities of available form of at least three nutrients [boron (B), sulfur (S) and zinc (Zn)] was deficient in all the samples except those from below heaps as per Sahrawat et al. 2007 [Current Science 93(10):1428-1432], (b) it indicates that the heap method has potential to convert total concentration of all these elements, which was similar in all the four treatment, into soluble form, (c) quantities of 'total' or unavailable form of all the elements was similar across treatments except sulfur indicating addition of sulfur with the items such as 'Amrit pani' etc. being applied, and this needs to be studied; (d) it was apparent that the heap method of cultivation has ability to continuously converting insoluble form of nutrients to soluble form (note: heap remains moist due to continuous application of water) and therefore seems to allow high microbial activity. Overall, the heap method potentially obviates the need of dependence on market purchased elements, provided the local soil has sufficient quantities.

**Soil biology parameters, Table 3:** (a) as indicated by microbial biomass carbon and nitrogen, the soil below heaps had most microbial activity/population followed by that in the original soil while the activity in the decomposing biomass in heaps was next highest, (b) activity of microorganisms as indicated by 'dehydrogenase' enzyme was also maximum in the sample collected below the heaps, followed by that in the heap itself, and lowest activity was noted in unplanted area between heaps which was covered with dry biomass, the noted high activity in the original soil is perhaps due to good growth of grass that would have allowed a good level of microbial activity in its root rhizosphere and needs further consideration.

**Soil microbiological parameters, Table 4:** (a) Population of bacteria inside heaps and below heaps was significantly more than the other treatments (range from 6.64 to 6.80 log<sub>10</sub> per g of soil); (b) population of actinomycetes and fungi was similar across the four treatments and ranged from 5.30 to 5.67 (log<sub>10</sub> per g of soil) in case of actinomycetes and from 4.00 to 4.51 (log<sub>10</sub> per g of soil) in case of fungi; (c) maximum population of the plant growth promoters and organic acid producers was inside heaps where lot of roots were noted during sampling and lowest in the soil below the heaps where chemical fertility was the highest; (d) population of *Pseudomonas* (indicators of ability of soil to manage diseases) and P-solubilizers could not be counted due to methodology problems; (e) N<sub>2</sub>-fixing bacteria (colonies that were looking like *Azotobacter*) was similar across the four treatments.

**On crops seen at your farm:** Like at your previous farm at the Yusuf Meherally Centre (YMC) Tara, Panvel district of Maharashtra, I was surprised by the very good growth of plants of a large number of species (at least 50) in a small area of much less than one acre (1 hectare = 2.42 acres). Surprisingly, the growth was stated to be of less than five months, almost the period when I saw similar good growth of plants at YMC when visited in April 2005. There were all signs of high productivity per unit area at the Krishi Tirth. When dug out, most plants had abundant roots and were white i.e. highly active, at both the farms. The visit to your farm at the Krishi Tirth, Bajwada in Sept 2007 was another good opportunity for me to learn and confirm my belief in your technology. However, the challenge remains on how to scale-up this kind of crop production protocol. But I see this need of 'scale-up' as a collective duty of the society in general and of the agricultural research institutions, in particular. I strongly recommend agricultural scientists and policy makers to visit your farm to believe the indicated level of productivity that has all potential of feeding families of small-holder farmers owning about one acre area and having access to one thousand liter water per day per ten Gunta (1 acre = 40 Gunta). It was the obvious good growth of different crops that prompted us to spend resources and collect the attached data. Interested scientists may like to verify it. I believe that if promoted strategically your technology can potentially feed not only poor of this country but of most developing countries.

**Challenge for you:** *Keep records of productivity of all crops per unit area of your model farm and compare it with that of any one or few neighbor farmers who are largely monocrop farmers.*

Yours Sincerely,



OP Rupela 12.5.08  
Principal Scientist (Microbiology)