



WASTE DECOMPOSER TO IMPROVE SOIL AND PLANT HEALTH: A SUCCESS STORY FROM THE TRIBAL BELT OF CHHATTISGARH UNDER THE 'FARMER FIRST' INITIATIVE

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Soil health is very important to produce healthy crops that in turn fulfil nutritional requirement of human beings and animals. Indeed, soil health is directly connected to the food quality and quantity. Soils supply essential nutrients, water, oxygen and root support to plants to make them grow healthy and flourish (FAO, 2015). To maintain soil health, it is very important to manage the agricultural waste, which mainly consists of crop residues that contain lots of organic carbon and other plant nutrients. Field retention of crop residue after harvest not only reduces soil erosion but also helps to enhance soil microbial growth.

Crop residue management is a challenging task in Chhattisgarh due to the predominance of rice-rice cropping system. This situation demands an effective waste disposal technology that can convert crop waste into some other valuable forms. Moreover, crop residue management at farm level is a time taking process that requires timely attention of the farmer. To solve this problem, National Centre of Organic Farming (NCOF) has developed a waste decomposer culture in the year 2015 that can be used for quick composting of organic waste. It is a consortium of microorganisms developed from local cow's dung that can also work as a biofertilizer and biocontrol agent along with improving soil health. Multiplication and application of waste

decomposer is simple and doesn't require much expertise. This makes the product farmers friendly.

Major advantage with this waste decomposer is that it is helpful to convert all types of biodegradable wastes into compost within 30-45 days. Further, it helps to reduce biotic stress in plants when used as foliar spray by controlling various insect pests and diseases. It is also recommended for seed treatment for uniform germination. So, judicious use of decomposer helps farmers to reduce the cost of cultivation especially in the purchase of organic fertilizers and pesticides.

FARMER FIELD DEMONSTRATION OF WASTE DECOMPOSER UNDER THE FARMER FIRST PROGRAMME OF ICAR-NATIONAL INSTITUTE OF BIOTIC STRESS MANAGEMENT

The institute Farmer FIRST project has introduced waste decomposer to the tribal farmers of Chhattisgarh to help them to resolve the problems associated with algal weeds proliferation in their lowland rice system. As rice fields used to be in flooded condition here rapid growth of algal weeds was a major problem in the initial months of crop growth. Though this condition leads to the crop weed competition for nutrients that affect the establishment of rice seedlings, sometimes it creates empty rice patches in rice fields (Ohadi *et al.*, 2021).



Here in the tribal rice fields farmers were facing serious problems in performing intercultural activities in the later stages of crop growth due to proliferation of algal weeds. Also, this has resulted low crop yield. Hence, in order to enhance the soil health and crop productivity by converting algal weeds to plant nutrients effortlessly ICAR-NIBSM, Raipur promoted rice growers to apply waste decomposer culture to rice fields after transplantation. The project team has conducted many field level demonstrations and several farmers adopted the technology (Figure1).



Figure 1. Demonstration of waste decomposer application in rice fields

PREPARATION AND APPLICATION OF WASTE DECOMPOSER

Preparation of waste decomposer culture is very easy and it requires very limited materials to multiply.



Figure 2. Multiplication of waste decomposer for field application

Procedure of waste decomposer culture preparation in large volumes for field application as follows:

1. Fill water in a 200 liter drum. Make a homogeneous solution of 2 kg jaggery in a separate bucket and pour this solution to water.
2. For the first purchase of waste decomposer mother culture get it from a trustworthy source. Add 30g mother culture to the sweet water solution in the drum and mix it well. Keep the drum under shade and cover the top with a cloth or jute sack.
3. This solution need to mix well using a wooden rod everyday for the first seven days. When the culture become ready for field application the colour of water changes along with development of foam and pungent smell (Figure 2).
4. Keep small quantity of the solution in a bottle so that it can be used as mother culture later. Rest of the solution can be used as soil drench, foliar spray, or with irrigation water. For the first, It is better to use 1000 liter solution per acre

For using waste decomposer with irrigation water it is better to keep a drum or cemented tank in a shady place near the field irrigation bodies in which the mixture of grasses, crop residues, kitchen waste, cow dung, and other organic wastes jaggery or molasses and waste decomposer mother culture can be filled. When these materials decompose properly, it can be used along with irrigation water.



IMPACT AND LESSONS LEARNT

Use of waste decomposer in rice fields helped farmers to get relatively higher yields. This technology has also reduced the input cost and use of chemical fertilizers that improved the profitability of rice cultivation. The visible difference observed between the experimental field and the neighbouring rice fields has helped other farmers to get informed about the technology as well as motivated to adopt it in their fields too.

ECONOMICS

The average yield of rice from the demonstration fields was 16.80 Quintal/acre which was about 15% more than that of previous year. The average input cost saved by farmers was approximately Rs. 2000/acre by adopting this eco-friendly technology.

REFERENCE

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