

EFFECTIVE MICROORGANISMS-BASED QUICK COMPOSTING

P. Anjibabu * and **V. Sai Surya Gowthami ***

* Ph.D. Scholar, Department of Soil Science and Agricultural Chemistry, Agricultural College, Bapatla

** Ph.D. Scholar, Department of Agronomy, Agricultural College, Bapatla

EFFECTIVE MICROORGANISMS

Microorganisms are tiny units of life that are too small to be seen with the naked eye and they exist everywhere in nature. Microorganisms are crucial for maintaining the ecological balance. They carry out chemical processes that make it possible for all other organisms including humans to live. There are friendly guys of the microbial worlds known as beneficial microorganisms and a not so friendly group called pathogens that are harmful and capable of producing disease, decay and pollution.

EM-BASED QUICK COMPOSTING

Effective micro-organisms (EM) consist of common and food-grade aerobic and anaerobic micro-organisms: photosynthetic bacteria, lactobacillus, streptomyces, actinomycetes, yeast, etc. The strains of the micro-organisms are commonly available from microbe banks or from the environment. There are no genetically engineered strains that are in use. A unit consists of nine pits measuring about 180 cm

(length) × 120 cm (width) × 90 cm (depth), enclosed by low walls and covered with a roof.

RAW MATERIALS

The raw materials for organic fertilizer production are:

Cow dung:	2 portions
Rice husk:	1 portion
Rice husk-charcoal:	1 portion
Rice bran, milled:	1 portion
Accelerator:	33 litres of EM solution or Trichoderma solution per pit

PREPARATION OF EM SOLUTION

One litre of 'instant solution' is made by mixing 10 ml of EM, 40 ml of molasses and 950 ml of water and leaving it for five to seven days, depending on temperature. The solution is then added to 1 litre of molasses and 98 litres of water to obtain 100 litres of ready-to-use EM solution. This amount is enough for three pits. The EM solution functioning as accelerator reduces the composting period from three months to one month.

PROCEDURE

All the ingredients are mixed together, except accelerator. A 15 cm layer of mixture is spread in the pit and accelerator is sprinkled on it. This procedure is repeated until the pit is full. The pit is covered with a plastic sheet. Two or three weeks later, the whole pit is mixed in order to boost aerobic decomposition. The compost is ready to use a couple of weeks later. A pit produces 900 kg of final product per batch. The product is usually packed in 30-kg plastic bags. Assuming that it takes 30 days on average to produce a batch and that only eight pits may be used for technical reasons, the annual potential production capacity is 86.4 tonnes (0.9 tonnes × 8 pits × 12 months). Within the framework of the FAO Technical Cooperation Programme project on promotion of organic fertilizers in Lao PDR (TCP/LAO/2901), a simple EM-based quick composting method, as detailed below, is promoted.

RAW MATERIALS

The raw materials for compost production are:

- Rice straw
- Farmyard manure
- Urea fertilizer
- EM solution

PROCEDURE

Straw is stacked in layers of 20 cm height, 1 m width, and 5 m length to form a pile. A unit pile is about 5 m (length) × 1 m (width) × 1 m (height) in size. The pile is sprinkled with water for adequate moisture content, followed by addition of a manure layer 5 cm high, and the sprinkling of a few handfuls of urea (100-200 g). EM solution, prepared in the same way as described in the Myanmar example, is sprinkled to accelerate aerobic decomposition. This procedure is repeated until the pile is about 1 m high and then it is covered with a plastic sheet. The pile is turned after two weeks and then again after another week. Normally, the compost is ready two weeks later when the heap has cooled down and the height of the pile has fallen to about 70 cm.



EM EFFECTS ON SOILS AND CROPS

EM has been used on many different soils and crops over a wide range of conditions. Results show that in most cases EM gives positive results. EM is not a substitute for other management practices. EM technology is an added dimension for optimising our best soil, and crop management practices such as crop rotations, use of composts, crop residue recycling, and biological control of pests. If used properly EM enhances soil fertility and promotes growth, flowering, fruit development and ripening in crops. It can increase crop yields and improve crop quality as well as accelerating the breakdown of organic matter from crop residues. The population of beneficial microorganisms in the soil is also increased helping to control soil diseases through competitive exclusion. In New Zealand EM has Bio-Gro certification as an “Approved organic product”.

EM FOR WEEDS PESTS AND DISEASES

EM is not a pesticide and contains no inorganic chemicals. EM is a microbial inoculant that works as a bio-control measure in suppressing and/or controlling pests through the introduction of beneficial microorganisms to soils and plants. Pests and pathogens are suppressed or controlled through natural processes by enhancing the competitive and antagonistic activities of the microorganisms in the EM inoculants.

