Volume-4, Issue-6, June-2015 • ISSN No 2277 - 8160

Research Paper | Agricultural Sciences

Promotion of Organic Farming Using Vermicomposting Technology in TamilNadu

G.Subbulakshmi — Department of Chemistry, GRT Institute of Engineering and Technology, Tiruttani, Thiruvallur, Tamil Nadu-631209, India

Dr. R.Thirunee lakandan — Departments of Chemistry, BIT CAMPUS, Anna University-620024, Thiruchirapalli, TamilNadu, INDIA

ABSTRACT

Organic farming is a system where readily soluble, synthetic fertilizer and biocides are avoided during cultivation. It relies on crop rotation, crop residues, animal manures, particularly vermicompost, legumes, green manures, and biological pest control to maintain soil productivity and tilth.Organic farming is recommended because the present chemical and machine dominated agriculture practice has resulted in i) loss of natural habitat and species of flora and fauna, ii) pollution of ground and surface water, iii) damage of soil structure, iv) reduced fertility of soil, v) reduction in food quality, vi) waste of energy since it is an energy intensive system, vii) economically costly. On the contrary organic farming maintains the ecological balance, enhances soil structure and is economically cheap. Tamil Nadu has total cropped area of about 6.63 mha with the diversified crops of which 10% of the area can be brought under organic farming with the available resources.

KEYWORDS : Agricultural Waste, Vermicomposting, Chemical Fertilizer, Organic Farming

INTRODUCTION

Tamil Nadu has total cropped area of about 6.63 mha with the diversified crops as rice, cotton, sugarcane, pulses, fruits, flowers and vegetables of which 10% of the area can be brought under organic farming with the available resources. There had been a decline in soil organic matter from 1.20 % in 1970s to 0.68 % in 2000. Organic matter content is usually used as an index of soil health, since it influences the soil in three ways, such as, physically, chemically, and biologically. Crop residues and animal dung are good sources of organic wastes to improve the organic matter content in the soil. In Tamil Nadu 200 lakh tones of crop residues and 300 lakh tones of animal dung are available. 1 These wastes can be composted and good organic manure will be obtained. Composting is allowing organic materials to decompose under more or less controlled conditions to produce a stabilized product that can be used as a fertilizer and/ or soil amendment. Daily around 75 tons of municipal solid waste is generated. From the bio-degradable waste (45%) 16.75 tones of organic manure will be produced on 60th day. Annually 5000 tones of organic manures were produced.

VERMICOMPOSTING FOR EFFECTIVE WASTE MANAGEMENT -VERMICOMPOSTING TECHNOLOGY

The cane trash and paddy straw obtained during harvest of sugarcane and rice crops were collected. These organic residues were shade dried for few days and cut into small pieces. It is preferable to select a composting site under shade, in an elevated level, to prevent water stagnation in pits during rains. Make small holes on the side of pits The organic residues were spread in the pit (6.0 x 1.0 x 0.6 m) up to 6^2 heights and 5 % dung slurry was uniformly distributed on the top of the organic residue sufficient to wet the surface. Over this layer another layer of organic residues was spread followed by spraying of dung slurry uniformly. This process was repeated till the spread of the organic residues 6^2 above the top of the pit. After partial decomposition of organic residues (attained in 15 days) the earthworms (Eisenia foetida) were released @ 1 kg (around 1000 worms) per 1 ton organic residues in to the bed by making holes at the top of the bed on four corners and centre of the pit. 4Throughout the composting process, sufficient moisture was maintained i.e. at 50 percent of maximum water holding capacity of a material. Sprinkling of water should be stopped when 90 % bio-wastes are decomposed. Maturity could be judged visually by observing the formation of granular structure of the compost at the surface of the pit. Normally after 60 days, organic refuse changes into a soft, spongy, sweet smelling; dark brown compost will be ready for collection. Harvest the vermicompost by scrapping layer wise from the top of the pit and heap under shed. This will help in separation of earthworms from the compost. Sieving may also be done to separate the earthworms, cocoons and eggs. The temperature and moisture content were maintained by sprinkling adequate quantity of water at frequent intervals.

AIR POLLUTION AND CLIMATE CHANGE

A major theme in organic practices is to operate in tight nutrient cycles to minimize loses to the air and water reserves. There is a reduction in air pollution not just from the lower carbon footprint but also from the absence of chemical sprays which get into the atmosphere. 2 These have been tremendous amount of chemicals which are used to direct lands to yield only desired products and not pests and weeds. This is especially can be tracked after agricultural revolution through using planes and tanks of materials. Agriculture is both cause and victim of climate change. According to the intergovernmental panel on climate change (IPCC), the annual amount of green houses gases emitted by the agricultural sector is estimated about six giga-tonnes CO2 in 2005. 3This represents approximately 10-12% of total greenhouse gases. As a consequence an organic farming system is only substitute to produce healthy products without any side effects locally (air pollution) and globally (climate change).Next to energy, conventional agriculture is one of the largest Green House Gas (GHG) contributor and accounts for more than "33% of the country's total GHG emissions" (Floresca, 2009), mainly caused by the application of chemical fertilizers and pesticides. By significantly reducing the amount of chemical inputs introduced in fields, each farmer can have a tangible contribution in reducing their carbon footprint, and in due course, their vulnerability to climate change. Since Organic agriculture production systems are less prone to extreme weather condition, water stress, and problems related to soil quality, it has been widely accepted as one of the most viable methods for climate change adaptation. 8 Through organic farming, the organic matter content on soils increases and therefore, provides higher holding capacities and resistive to drought.

Organic Farming: Good Practice for Soil Quality Preservation

Many researchers have recently published the effects of farming on soil quality. 5 Focusing on the level of manure and chemical use, they have shown that organic farming is the best agricultural practice for sustainable land management, in particular through the enhancement of the microbial activity in the soil leading to increased mineral exchange between plants and soil. (Figure 1).

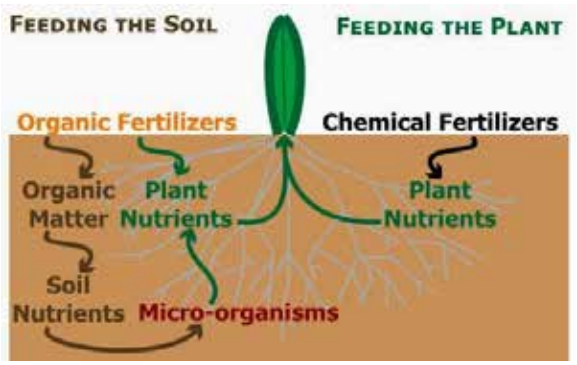

Fig. 1. Comparison between the Organic manure and Chemical fertilizer

In the long run, organic farming offers advantages compared to conventional farming because it not only promises higher yields but also ensures higher yield security, reduces dependence on external input and thus makes poor households less crisis-prone. 6 These are weighty arguments, especially in marginal locations.

Conclusion

The earthworm composting is one of the appropriate technologies that serve as both effective waste management strategy as well as good source of fertilizer for farm households. Vermicompost from several substrates sources enhances soil organic matter improving water retention, soil structure, and carbon stock. There are compelling evidences that humid substances isolated from vermicomposting act as plant growth regulators. Unlike chemical synthetic fertilizers, these substances express the hormone-like activity by mechanisms that are associated with several enzymes activation, especially the key enzymes for plant growth and nutrients uptake: plant proton pumps. Moreover, recycling organic wastes reduces the need for chemical fertilizers and consequently the pollution caused by its dumping on soil.

REFERENCES

1. Ansari.A. A and Ismail.S. A, "Vermitechnology in Organic Solid Waste Management. Journal of Soil Biology and Ecology. 2001 a, 21, 21-24. || 2. Mall. A.K, Dubey. A and Prasad. S, "Vermicompost: an inevitable tool of organic farming for sustainable agriculture. Agro bios Newsletter. 2005, 3(8), 10-12. |