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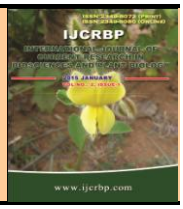

Case Study

Bio-compost Resource Centres in Different Agro-climatic Zones of India: A Case Study

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A b s t r a c t

Food production of a country is closely associated with its population. Increased production from a unit area brings abundant pressure on land. This leads to denudation of forests and grass land cover and increase of soil erosion. Energy resources are necessary for intensive agriculture and investments are not only involved in highly mechanized from operations but also in the production of fertilizers, herbicides, pesticides and other materials commonly used in modem agricultural practices. Energy and fertilizer constitute a serious problem and farming does not remain economically feasible in India. Moreover, increased use of fertilizer may lead to health hazards apart from soil erosion. Increasing population has therefore compelled to take necessary steps to increase food production by alternative means like to develop bio-compost resource centres (BRC) in different agro-climatic zones.

K e y w o r d s

Bio-compost resource centre

Organic farming

Low external input

Integrated nutrient supply system

Introduction

Under the emerging situation of the global energy crises and escalating high cost inorganic fertilizers dependence on chemical fertilizers alone as a source of plants nutrients has to be supplemented by some other source. India has a great potential for the production and use of organic manures in cropping systems. Organic manures are valuable not only as suppliers of nutrient elements such as N, P and K but even more so for their ability to mobilize native soil phosphorus and render it available to crops. They even enhance fertilizer use efficiency when applied in conjunction with mineral fertilizers. The time is ripe when we should look for alternative system of agriculture. We are forced to look for low supply agencies that can re-establish our farm economy. We are to look to, our natural resources for a sustainable agriculture that can restore ground water supply, recycle the farm and increase food production of the country. Organic Farming is the only way to make country self-sufficient in food production and of course, earthworms are essential components of organic farming.

Organic residues however are bulky and have low nutrient contents. The estimated Contrary to the Low External Input (LEI) and Organic farming, the INSS (Integrated Nutrient Supply System) involves a low to medium external input approach taking into holistic view of soil fertility and plant nutrient management for a targeted yield based not only on cropping and farming systems but also distinct geographical areas or villages as dynamic system.

With almost twice the quantity of plant nutrients being removed from soil than what is added through fertilizers, the growing nutrient imbalance poses a major threat to sustain soil health and crop productivity. The recent fall in fertilizer consumption due to unprecedented hike in the prices of P and K fertilizers has further aggravated the problem and has underlined the need for adoption of Integrated Nutrient Supply System (INSS) which involves the combined use of different nutrient sources such as chemical fertilizers, organic manures and bio-fertilizers etc.

Bio-fertilizers as component of BRC

Bio-fertilizers (BF) (microbial nutrients) are the products containing living cells of different types of microorganisms which have an ability to mobilize nutritionally important elements from non usable to usable form through biological process. Although the advent of the phenomena is as old as a century, the need of its commercial exploitation was not felt in traditional agriculture. In recent years, bio-fertilizers have emerged as an important component of INSS and hold a promise to improve the crop yields and nutrient supplies.

IPNM as component of BRC

The basic concept underlying the IPNM (Integrated Plant Nutrient Management) is the maintenance of adjustment of soil fertility and of plant nutrient supply to an optimum level for sustaining the desired crop productivity through optimization of the benefits from all possible sources of plant nutrients in an integrated manner. The appropriate combination of mineral fertilizers, organic manures, crop residues, compost of N-fixing crops varies according to the system of land use and ecological, social and economic conditions and decreases in subsidy on fertilizers by Government have become the cause of concern to the government, fertilizer industry and farmers. Import of fertilizers to meet the growing demand has imposed a heavy foreign exchange burden on the country. In this context, it was considered necessary for an alternative renewable source of nutrient supply to the crops and as such emphasis has been given to the fertilizers of the biological origin (Table 1). The bio-fertilizers and green manures are used in agriculture to combat the ill-effects of chemical fertilizers. It is necessary to adopt an integrated nutrient supply system by means of judicious combination of fertilizers, organic manures and bio-fertilizers.

Table 1. Nutrient potential of organic sources in India (in million tonnes).

Source	Qty.	Nitrogen	Phosphorus	Potash	Total
Cow/Buffalo Dung	200	3.4	1.3	2.2	6.9
Crop residue	300	6.0	0.3	1.6	7.9
Total	500	9.4	1.6	3.8	14.8

Organic Farming as component of BRC

Organic farming is the agriculture system which aims at cultivation of the land in a way so that the soil is kept dynamic with living activities and in good health, at the same time keeping the environment clean, maintaining the ecological balance and providing stability to the production level without polluting soil, water and air. It is concerned with the best use of natural resources and maintaining their balance. In this system, soil is not only considered to be physical medium for standing crop but also as a shelter of innumerable living entities. In fact, it is the only means to achieve the stable /sustainable target of production. It is feasible by adopting multi-dimensional approach which involves co-ordination and interaction between several major or minor factors, the cumulative effects of which are astonishing. The constituents of organic farming of BRC may be: i) Integrated Plant Nutrient Supply Management, ii) Integrated Insect Pest Disease Management; and iii) Integrated soil and Water Management.

Vermicompost as component of BRC

The compost prepared by using earth worms is called vermicompost. This is regarded as a very

important component of organic farming. Earthworms from time immemorial regarded as friend of the farmers. They not only inhabit the soil, but by virtue of their activity cause several physical and bio-chemical changes in the soil leading to the improving the soil fertility and plant growth. Soil is inhabited by the several microbes. Vermicompost can be prepared easily, and has excellent properties and is absolutely harmless to the plants. Vermicastings are the faecal casting released by the earth worms, while vermiculture is the culture of the earth worms. The method of vermin-composting adopted is called vermitechnology, this can be done in pits, concrete tanks, plastic crates, wooden crates and well rings and for that matter in any container into provision to avoid, water stagnation. Cocoons are the fertilized egg cases released by the earth worms after copulation. These cocoons are found in large quantities in fertile soils having a good population of earthworms.

It is always beneficial to manage earthworms in field itself for that the following points should be observed:

1. Mulching the soil into organic wastes and provision of other food sources such as cattle dung or biogas slurry along with appropriate water management can support an active population of native worms is soil.
2. Soil moisture and organic matters shall be kept at optimum levels.
3. Periodical replenishment of the much and dung/ slurry will enable the worms and other soil life to thrive well without any difficulty.

Need for the bio-compost resource centres

Unlike chemical fertilizers compost is economical. It increases productivity, water holding capacity and nutritional value of soil, that needs lesser water, energy and inputs, unlike pesticides, to raise crops. The environment is also protected. The soil and water that are so highly polluted because of chemical farming need our attention to go for farming, through earth worms. In this direction, in our earlier studies we has done pioneer work since 2000 through setting-up over 7000 Vermicompost Unit in different development blocks of western U.P.,India. The farmers have been trained in vermitechnology and motivated to produce vermicompost in their own fields and take-up organic farming. It is heartening to note that production of vermicompost and their marketing through farmers, though at a small scale, is now a ground reality. This needs to be further expanded through setting-up of big Units.

This necessitates taking-up this programme on a wide scale covering larger segment of population of farmers. Besides upgradation of vermiculture units, it is desirable to set-up new bio- compost resources centres in different agro-climatic zones of the country for support, research management and technology transfer related to proper handling and utilization of organic wastes and promotion of organic farming. Informational database both hard and electronic versions is need of the day and to make it available for distribution to the farmers of the area.

Conclusions

Based on this rationale the BRC (Bio-compost Resource Centres) has should formulated in different agro-climatic zones with the objectives: i) training and education to beneficiaries (including farmers);ii) economic incentives to beneficiaries to facilitate utilizing waste; iii) investigation into the development of a centralized cogeneration facility; iv) establishing of a committee to review and streamline bio-compost permitting processes; v) encouragement and economic incentives to farming sector.

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