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Review Article

A SURVEY ON ORGANIC FARMING BY USING BIOFERTILIZERS - A REVIEW

SATISH MOHOD¹, G.P.LAKHAWAT², S.K.DESHMUKH³, R.P.UGWEKAR⁴

^{1,2,3}Priyadarshini Institute of Engineering & Technology, Nagpur-440 019

⁴Laxminarayan Institute of Technology, Nagpur- 440 033

Corresponding Author: glakhawat@rediffmail.com

Abstract

The present scenario of the Indian Agriculture clearly shows that removal of nutrients by the crops from soil is much higher than their replenishment through fertilizers and this causes nutrients deficient soils, posing a serious threat to sustainable crop production and long term soil health. This demand and supply gap in nutrition is expected to continue in the years to come because the farmers cannot afford to purchase the costlier chemical fertilizers which are the important input in Agriculture. Under such circumstances, identification of renewable nutrient sources and their proper utilization in agriculture production system assumes a great significance. Sustainable agriculture relies greatly on renewable resources like bio-fertilizers. The bio-fertilizer production units are already functioning at some of the research stations of PDKV, Akola(India) producing bio-inoculants like Azotobacter, Azospirillum, Acetobacter, Rhizobium, PSB, BGA, decomposing culture and Trichoderma etc on small scale.

Keywords: Agriculture, bio-fertilizer, nutrition, bio-inoculants.

Introduction

Govt. of Maharashtra is encouraging the farmers for use of organic inputs for sustainable agriculture. The quality organic inputs like bio-fertilizers, bio-inoculants, vermicompost etc are to be supplied to the farmers to improve the soil health and also be increase crop production. It is therefore, necessary to produce quality bio-fertilizers like Azotobacter, Azospirillum, Gloconacetobacter, Rhizobium, PSB and bio-inoculants like Trichoderma. Now days the concept to organic farming is gaining importance and there is increasing awareness about the use of natural products. The demand of bio-fertilizers and bio-inoculants will definitely increase many folds in the near future. "A biofertilizer is a substance which contains living organisms which, when applied to seed, plant surfaces, or soil, colonizes the rhizosphere or the interior of the plant & promotes growth by increasing the supply or availability of primary nutrients to the host plant".

At present a total of 2493 tonnes of biofertilizer is being produced by 52 private / subsidized biofertilizer Production Units in Maharashtra State. Moreover 499.33 tones of biofertilizer is produced by Mahatma Phule Krishi Vidyapeeth, Rahuri at its various biofertilizer production units. However the actual requirement of bio-fertilizers (for different crops) in Maharashtra state is as under. The excess uses of chemical fertilizers in agriculture are costly and also have various adverse effects on soils i.e. depletes water holding capacity, soil fertility and disparity in soil nutrients. It was felt from a long time to develop some low cost effective and eco-friendly fertilizers which work without disturbing nature. Now, certain species of micro-organism are widely used which have unique properties to provide natural products, and serve as a good substitute of chemical fertilizers.

Table 1 : Biofertilizer production vis-à-vis requirement in Maharashtra.

Sr. No.	Crops	Area	Biofertilizer requirement (tones)
1.	Cereals	8017.1	9136
2.	Pulses	3493.8	8726
3.	Oilseed	3835.7	6576
4.	Cash crops	3955.7	8954
5.	Vegetables	197	664
6.	Horticultural crops	437	51810
	Total	19936.3	85865

Thus there is a deficit of more than 80,000 tones of biofertilizer in the state to increase the production of quality bio-fertilizers and to increase its use in field crops, cash crops, fruit crops, vegetable and floriculture, additional production unit of bio-fertilizers need to be established. Mahatma Phule Krishi Vidyapeeth, Rahuri proposes to establish biofertilizer units at NARP , Ganeshkhind Pune, ARS Niphad, NARP Igatpuri, ARS Jalgaon, WRRS Mahabaleshwer, ARS Kasbe Digraj, ARS Pimpalgaon Baswant and ARS Lonavala to meet the requirement of the State.

The objectives of biofertilizer is to produce quality bio-fertilizers like Azotobacter, Rhizobium, Acetobacter, Azospirillum and PSB , to produce quality compost cultures , to produce quality bio-control agent-Trichoderma and to sale bio-fertilizers and bio-control agent to farmers at cheaper rate.

We hypothesized that biofertilizer performance depends on the amount & type of chemical fertilizer applied in concert with the biofertilizer & that such knowledge cannot improve inoculation efficacy.

(Alternate Hypothesis):- We hypothesized that biofertilizer performance depends on the amount & type of chemical fertilizer applied in concert with the biofertilizer & that such knowledge can improve inoculation efficiency.

Materials and Methods

Biofertilizers are defined as preparations containing living cells or latent cells of efficient strains of microorganisms that help crop plants uptake of nutrients by their interactions in the rhizosphere when applied through seed or soil. They accelerate certain microbial processes in the soil which augment the extent of availability of nutrients in a form easily assimilated by plants. Very often microorganisms are not as efficient in natural surroundings as one would expect them to be and therefore artificially multiplied cultures of efficient selected microorganisms play a vital role in accelerating the microbial processes in

soil. Use of biofertilizers is one of the important components of integrated nutrient management, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. Several microorganisms and their association with crop plants are being exploited in the production of biofertilizers.

Collection of Data:

The data used for the project is primary as well as secondary data as follows:

Source of primary data: - Which is collected a fresh & happens to be original in nature. The data will be collected by following methods.

Personal Interviews :- are taken of existing farmers those who were using chemical fertilizers since long & the other farmers those who now a days have started using biofertilizers & question asked are related to their opinion on the performance of biofertilizers & yield response to both after using chemical fertilizer & biofertilizer & from the answer given interview are drawn.

Questioners:-

The data was collected by means of the questionnaire. This method is best to analyze. The structured questionnaire was used to collect the data from the farmer's. The questionnaire was structured in a closed ended as well as open ended format.

Sampling & sample size:-

Keeping in mind the objective of the study, a survey based research was undertaken the total sample size of research was of 50 (25 farmer's using chemical fertilizer's) & (25 using biofertilizer's) & was selected from nearby villages. The technique of random sampling is used for the sample selection. Under these techniques the population is divided in two different groups & randomly farmer's from each group is selected.

Limitations:

Though the biofertilizer technology is a low cost, ecofriendly technology, several constraints limit the application or implementation of the technology the constraints may be

- environmental,
- technological,
- infrastructural,
- financial,
- human resources,
- unawareness,
- Quality, marketing, etc.

The different constraints in one way or other affecting the technique at production, or marketing or usage.

Expected contribution

Bio-fertilizers are being essential component of organic farming are the preparations containing live or latent cells of efficient strains of nitrogen fixing, phosphate solubilizing or cellulolytic micro-organisms used for application to seed, soil or composting areas with the objective of increasing number of such micro-organisms and accelerate those microbial processes which augment the availability of nutrients that can be easily assimilated by plants. Biofertilizers play a very significant role in improving soil fertility by fixing atmospheric nitrogen, both, in association with plant roots and without it, solubilise insoluble soil phosphates and produces plant growth substances in the soil. They are in fact being promoted to harvest the naturally available, biological system of nutrient mobilization. The role and importance of biofertilizers in sustainable crop production has been reviewed by several authors constraints

Conclusion

Biofertilizers are fertilizers containing living microorganisms, which increase micro- bial activity in the soil. Often, organic food is included to help the microbes get established.

Bio-fertilizers being essential components of organic farming play vital role in maintaining long term soil fertility and sustainability by fixing atmospheric di-nitrogen (N=N), mobilizing fixed macro and micro nutrients or convert insoluble P in the soil into forms available to plants, there by increases their efficiency and availability. The proper application and use of biofertilizers will not only have an impact on sustainable agriculture's economic development but it will also

Contribute to a sustainable ecosystem and the holistic well-being.

Organic manures (bio- fertilizers) would be the viable option for farmers to increase productivity per unit area.

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