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Role of Biofertilizers in Organic Agriculture

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SUMMARY

Bio-fertilizers are one of the best modern tools for agriculture .It is a gift of our modern agriculture science .Bio-fertilizers contain only those living organisms which has specific functions to enhance plant growth and reproduction and promote the adequate supply of nutrients to host plants and ensure their proper develpoment of growth and regulation in the physiology. Biofertilizers are applied in the agriculture field as a replacement to our conventional fertilizers. Liquid bio-fertilizer technology now, shares more advantages over conventional carriers based biofertilizers and can be considered as a breakthrough in the field of Bio-fertilizer technology and should find the greater acceptance by farmers extension workers, commercial bio-fertilizers manufacturers. Bio-fertilizers being essential components of organic farming plays a vital role in maintaining long term soil fertility and sustainability by fixing atmospheric dinitrogen in the soil. In this context, organic manure (Bio-fertilizers) would be the viable option for farmers to increase the production per unit area.

INTRODUCTION

Organic farming has emerged as an important priority area globally in view of the growing demand for safe and healthy food and long term sustainability and concerns on environmental pollution associated with indescrimental use of agro chemicals. Bio-fertilizers are being essential component of organic farming are the preparation containing live or latent cells of efficient strains of nitrogen fixing, phosphate solubilizing or cellulolytic microorganisms used for application of seed, soil or composting area with the objective of increasing number of such microorganisms and accelerate those microbial processes which makes the chance for availability of nutrients that can be easily assimilated by plants. Bio-fertilizers plays a very significant role in improving soil fertility by fixing atmospheric nitrogen by association with plants roots, solubilise insoluble soil phosphates and produces plant growth substances in the soil.it may be noted only 30% of india's total cultivable area is covered with fertilizers where irrigation facilities are available and the remaining 70% of the areable land which is mainly rainfed ,very negligible amount of fertilizers are being used. Farmers in these areas often use organic manures as a source of nutrients that are readiliy available either in their own farm or in locality.

Why to explore Bio-fertilizers:

More use of synthetic fertilizers has led to the pollution and contamination of the soil, which has polluted water basins, destroyed microorganisms and friendly insects, making the crop more prone to diseased and reduced soil fertility. Following points of greatest concern. Demand is much higher than the availability .it is estimated that by 2020 ,to achieve the targeted production of 321 million tonnes of food grains, the requirement of nutrients will be 28.8 million tonnes , which their availability will be the only 21.6 million tonnes being a deficient of about 7.2 million tonnes.

Important Bio-Fertilizers in Organic Culture.

- Nitrogen Fixers : Rhizobium, Azospirillium, Azotobacter, Blue green algae and azolla
- Phosphate Solubilizers
- Phosphate Absorber: Mycorrihiza (an ancient symbiosis in organic agriculture),
- Zinc solubilizers.

Potential Role of Bio-Fertilizers in Agriculture

Nitrogen -fixers and phosphate solubilizers: The use of biofertilizers plays an important role in improving soil fertility, yield attributing characters and therby final yield has been reported by many workers .in addition, their application in soil improves soil biota and minimises the sole use of chemical fertilizers. In rice under low land conditions, the applications of BGA + Azospirillium proved significantly beneficial in improving LAI (leaf area index) and all yield attributing aspects. Grain yield and harvest index also exhibit an increasing

with the use of bio-fertilizers. Field trails carried out in different locations have demonstrated that under certain environmental and soil conditions inoculation with azotobacterial has beneficial effects on plant yields. inoculations with Azotobacter + Rhizobium + VAM gave the highest increase in straw and grain yield of wheat plants with rock phosphate as a P-fertilizer concluded that with microbial inoculation rock phosphate could be used as a cheap source of P in alkaline soils and that combined inoculation could reduce the rate of fertilizer required to maintain the productivity. It is an established fact that the efficiency of phosphatic fertilizers is very low (15-20) due to its fixation in acidic and alkaline soils and unfortunately both soil types are predominating in india accounting more than 34%acidity affected and more than seven million hectares of productive land salinity/alkaline affected. Therefore, the inoculations with PSB and other microbial inoculants in these soils become mandatory to restore and maintain the effective microbial populations for solubilization of chemically fixed phosphorous and availability of other macro and micronutrients to harvest good sustainability yield of various crops.

Mycorrhizae:

Arbuscular mycorrhizal (AM) fungi is most abundant in agriculture. they account of 5-50% of the biomass of soil microbes and some products formed by them may account for another 3000kg .pools of organic carbon such as glomalin produced by the AM fungi may even exceed soil microbial biomass by a factor of 10-20.the external mycelium attains a much as 3% of root weight .approximately 10-100m mycorrhizal mycelium can be found per cm root .the mineral acquisition from soil is considered to be the primary role of mycorrhizae ,but they play others various role in agriculture. It improves nutrients uptake (macro and micronutrients), helps in better water relation and drought tolerance, improves soil structure, enhances phytohormone activity and crop protection (interaction with soil pathogens).

Constraints in Bio-Fertilizers Use:

- Production constraints: Unavailability of appropriate and efficient strains, Unavailability of suitable carrier and Mutation during fermentation.
- Market level constraints: Lack of awareness of farmers, inadequate and inexperienced staff, lack of quality assurance and seasonal and unassured demand.
- Resource constraints: Limited resource generation for BF production.
- Field level constraints: Soil and climate factors, native microbial population, faculty inoculation technique and liquid bio-fertilizers (breakthrough in bio-fertilizer technology)

CONCLUSION

All over the world, agricultural production needs to be increased in order to feed the over increasing population. But intensive agriculture with excessive use of agrochemicals leads to deterioration of environment, like pollution ground water. And make the top soil unsuitable for crop to grow. However with the intervention of new technology like nanotechnology that can be applied in precision farming. This techniques leads to enhance crop yield and at last we can feed our people and sustain our environment for better future.

REFERENCES

Duhan J.S., Kumar R., Kumar N., Kaur P., Nehra K. and Duhan S. (2017), Nanotechnology: The new perspective in precision agriculture, Biotechnology Reports 15:11-23

Anjum M. and Pradhan S. N.(2018), Application of nanotechnology in precision farming: A review, International J. Of Chemical Studies, 6(5):755-760

Elumalai K., Velmurugan S., Ravi S., Kathiravan V. and Ashokkumar S. (2015), Green synthesis of zinc oxide nanoparticles using Moringa oleifera leaf extract and evaluation of its antimicrobial activity, Spectrochim. Acta Mol. Biomol. Spectrosc. 143: 158-164.

Vandergheynst J.S., Scher H.B., Gou H.Y. and Schultz D.I. (2007), Water in oil emulsions that improve the storage and delivery of the biolarvacide Lagenidium giganteum, Biol. Control 52:207-229.