

Importance and use of Bio Fertilizers

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Nitrogen, Phosphorous and Potash play a very important role in the growth of plants. Fertilization plays an important role in increasing the yield of flowers. Chemical fertilizers and pesticides are used to increase plant production which also causes damage to the environment and ecology. So, organic fertilizers are used which are beneficial for the environment and ecology and don't cause any damage or threat.

Biofertilizers are the microorganisms that help to maintain and increase the nutrient quality of the soil. The biofertilizers are applied in the soil or plant surfaces which help to provide the nutrients and promote the growth of the plants (Vessey, 2003). With the use of chemical fertilizers, we can get a better yield but with the use of chemical fertilizers, the soil becomes poor and the important nutrients which are present in the soil are depleted. Biofertilizers are eco-friendly fertilizers that don't damage natural resources. Biofertilizers are used to increase the quality and yield of the crop. The use of biofertilizers helps to reduce the use of chemical fertilizers. Biofertilizers contains symbiotic and non-symbiotic microorganism that can result in higher resistance of the plant to diseases and increase plant growth rate. In sustainable agriculture, the mycorrhizal fungi and vermicompost can be used as organic fertilizers.

Phosphorous (P) is a very important growth-limiting nutrient and there is no atmospheric source is present like nitrogen (Ezawa *et al.* 2002). The Phosphorous nutrient is used for the seed and flower formation, N fixation in legumes, root development, stalk and stem strength, crop production and maturity, crop quality and resistance in plant diseases. Soil microorganisms play a major role in the soil that they help to provide the phosphate nutrients to the plants in the available form (Richardson, 2001).

Phosphorous Solubilizing Bacteria (PSB) is a microorganism that is used for mobilizing the nutrients into a usual form from the non-usable with the help of the biological processes by the stimulation of the growth of the plants through the fusion of the substances that causes growth promotion causes earlier growth, flowering and yield (Lin. Suchen *et al.* 2001). Since the 1950s, Phosphate Solubilizing Bacteria (PSB) is used as a biofertilizer (Kudashev, 1956; Krasilnikov, 1957). By solubilizing precipitated phosphates and by mineralizing organic Phosphorous (P) in the soil, the microorganisms provide the phosphorous to the plants in the available form (Chen *et al.* 2006; Kang *et al.* 2002; Pradhan and Sukla, 2005). In phosphorous solubilization, the bacteria are more effective than the fungi (Alam *et al.* 2002). The plant growth regulating bacteria is produced in the root zone of the plants which also helps in controlling the plant pathogens (Milosevic *et al.* 2005). The Azotobacter is a biofertilizer that is used in the cultivation of most crops, it is a free-living nitrogen-fixing bacteria (Kennedy *et al.* 2004). The Azotobacter helps to fix about 60-90 kg N/ha yearly and in crop production, Azotobacter can be used in the place of nitrogen fertilizers (Dobereiner, 1997).

Azospirillum is a biofertilizer that contains bacteria that are very beneficial for many plants (Bashan and de-Bashan, 2010; Hungria *et al.* 2010; Hungria, 2011; Fukami *et al.* 2016; Pereg *et al.* 2016). The Azospirillum helps in the fixation of N₂ and promotes plant growth. The Azospirillum is also used for the control of plant pathogens (Bashan and de-Bashan 2002a, b; Khan *et al.* 2002; Romero *et al.* 2003; Tortora *et al.* 2011). The Azospirillum is applied in the many types of crops which show positive and beneficial results (Okon and Labandera- Gonzalez, 1994; Bashan *et al.* 2004; Pereg *et al.* 2016).

Conclusion

Biofertilizers are those fertilisers that help plants to get nitrogen, phosphorous, and potassium in the available form. The biofertilizer also aids in soil texture improvement. The yield of the plants is raised by 15-35 per cent when biofertilizers are used. Biofertilizers are fertilisers that do not pollute the environment.

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