LIQUID BIOFERTILIZERS

Biofertilizers are natural fertilizes which are living microbial inoculants of bacteria, algae, fungi alone or in combination and they augment the availability of nutrients to the plants. The role of biofertilizers in agriculture assumes special significance, particularly in the present context of increased cost of chemical fertilizer and their hazardous effects on soil health.

Liquid biofertilizers are liquid formulation containing the dormant form of desired microorganisms and their nutrients along with the substances that encourage formation of resting spores or cysts for longer shelf life and tolerance to adverse conditions. The dormant form on reaching the soil, germinate to produce fresh batch of active cells. These cells grow and multiply by utilizing the carbon source in the soil or from root exudates.

Role of Liquid Bio-fertilizers in various crops:

- Enhances soil health and fertility
- Increase crop yield.
- Shorten the time of replenishing the soil in Jhum cultivation, hence net cultivated land can be increased.

- Reduce the need for chemical N, P, K fertilizers.
- Returns are economically viable
- Besides the major nutrients, additional advantages like secretion of plant growth hormones and made available the important micronutrient like Zn, Mn, Cu, Fe, Co.

- Diseases and pest occurrence reduced due to the antagonistic properties of the biofertilizers.

Advantages of Liquid Bio-fertilizers over conventional carrier-based Bio-fertilizers:

- Longer shelf life of 12-24 months.
- No contamination.
- No loss of properties due to storage up to 45^{o}C.
- No effect of high temperature.
- Greater potentials to fight with native populations.
- The high population can be maintained more than 10^{9} cells/ml up to 12-24 months.

- Better survival on seeds and soil.
- Easy to be used by the farmer.
- Dosage is 10 times less than carrier powder based bio-fertilizers. Can be used in drip irrigation and as a component of organic farming.

The following biofertilizers are being produced at Regional Agricultural Research Station, Anakapalle.

S. No	Name of the Biofertilizer	Crop Suitability (Field crops)	Quantity required per acre.	
			Power formulation	Liquid formation
1.	Azospirillum	Suitable for all crops	2kg as soil application	500 ml as soil application
2.	Azotobacter	Suitable for all crops	2kg as soil application	500 ml as soil application
3.	Rhizobium	Suitable for groundnut & pulses	500 g. as seed treatment.	5-8ml. per kg seed as seed treatment.
4.	Phosphobacteria (PSB)	Suitable for all crops	2kg as soil application	500 ml as soil application
5.	Potash Releasing Bacteria (KRB)	Suitable for all crops	2kg as soil application	500 ml as soil application

S. No	Name of the Biofertilizer	Mode of action	Crop Suitability	Quantity required per acre. for Floriculture and Olericulture crops		Quantity required per tree in Plantation & Horticulture crops	
				Power formulation	Liquid formation	Power formulation	Liquid formation
1.	Azospirillum	Azospirillum is a rhizosphere bacterium colonizing the roots of crop plants making use of root exudates and fixes substantial amount of atmospheric nitrogen.	Suitable for all crops	2 kg as soil appli-cation	500 ml as soil appli-cation	100 g. as soil appli-cation	20-25 ml as soil appli-cation
2.	Azotobacter	*Azotobacter* species are free-living, nitrogen-fixing bacteria; normally	Suitable for all crops	2 kg as soil appli-	500 ml as soil appli-	100 g. as soil appli-	20-25 ml as soil

		fix molecular nitrogen from the atmosphere without symbiotic relations with plants.	particularly for all horticultural crops(vegeta-bles, fruits & flowers)	cation	cation	cation	appli-cation
3.	Phospho bacteria (PSB)	Phosphate solubilizing bacteria (PSB) are beneficial bacteria capable of solubilizing inorganic phosphorus from insoluble compounds.	Suitable for all crops	2 kg as soil appli-cation	500 ml as soil appli-cation	100 g. as soil appli-cation	20-25 ml as soil appli-cation
4.	Potash Releasing Bacteria (KRB)	Mechanism of K-solubilization could be mainly attributed to excrete organic acids which either directly dissolves rock K or chelate silicon ions to bring K into solution.	Suitable for all crops	2kg as soil appli-cation	500 ml as soil appli-cation	100 g. as soil appli-cation	20-25 ml as soil appli-cation

The rate for supply of above powder biofertilizers is **Rs.40/- per kg** and liquid biofertilizers is **Rs.300/- per litre including** transport charges (Rates fixed by Commissioner of Agriculture).