

Biofertilizers for Increasing Crops Yield

Background

- Poor soil fertility
- Low organic matter (<1%)
- High pH (8.5)
- Phosphorus fixation (80%) due to high amount of free calcium carbonates in soil
- Salt affected soils & Brackish underground water (6.7mha)
 - Imbalanced use of fertilizers
 - Low fertilizer use efficiency
- Current fertilizer use level is quite high but crop yields are low
- Rapid increase in fertilizer prices (up to 3 fold)
- About 20% of natural gas produced is being used for chemical fertilizer production



Why Biofertilizer

- LRRI successfully promoted Seed inoculants of food legumes since 1996
- LRRI, NARC further isolated Beneficial microorganisms isolated for cereals and other crops (rice, maize, wheat, cotton, sugarcane etc)
- Organisms are multiplied in lab under controlled conditions
- Use as seed inoculants successfully demonstrated since 2007
- They are used to;
 - i. Enhance the productivity of the soil.
 - ii. Fix atmospheric nitrogen and solubilize phosphorus.
 - iii. Stimulate plant growth through synthesis of plant growth promoting substances and control root pathogens.
 - iv. Environment friendly & cost effective



Developed & Commercialized Bio-fertilizers

Three types of Biofertilizers developed and are being registered with Department of Agriculture, Govt. of Punjab, Lahore;

1. Biozote – N: (for legumes)

- Nitrogen fixer for legume crops.
- 20-50% increase crop yields
- Provides 20-25 kg N ha⁻¹ to succeeding crop

2. Biozote – P: (for all crops)

- Solubilizes fixed P in soil
- Increases the efficiency of applied P fertilizers
- Increases the availability of micronutrients
- 10-15% increase crop yields
- Saves P fertilizers up to 25%

3. Biozote – Max: (for all non-legume crops)

- Produces plant growth promoting hormones
- Increases the efficiency of applied fertilizers



- Improves plant growth and vigor
- Controls root pathogens
- 10-15% increase crop yields
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Issues and Challenges

- New technology require scientific backup during commercialization
- Private sector need be trained in proper handling during marketing
- Investment needed for developing production units
- Trained manpower required
- Farmers training needed in seed application and sowing protocols
- Coherence in operations between production and distribution



Control (Un-inoculated)

Implementation Strategy

- Production facilities development
- Public-private investment
- Partners Identification
- Trained manpower for production unit
- Distributes training
- Farmers trainings
- Monitoring for quality assurance



(Biozote Inoculated)

Benefit

- Environment friendly and helps in saving fertilizers and increases crop yields significantly
- Integral part of sustainable agricultural practices and organic farming
- Appropriate for small entrepreneurs,
- Generate employment and reduce farm poverty