Revolutionize Agriculture with Advanced Microbial Cultures for Sustainable Growth

Discover the power of microbial cultures in transforming agriculture. At NTHRYS, we provide cutting-edge microbial solutions designed to enhance crop productivity, improve soil health, and promote sustainable farming practices. Elevate your agricultural operations with eco-friendly and efficient microbial products.

Categories of Microbial Cultures Based on Function

1. Nitrogen-Fixing Microbes

Nitrogen-fixing microbes play a critical role in converting atmospheric nitrogen into forms usable by plants, reducing dependency on synthetic fertilizers.

- **Rhizobium spp.**: Symbiotic bacteria forming nodules in leguminous plants like chickpeas, lentils, and soybeans.
- **Azospirillum spp.**: Free-living bacteria enhancing nitrogen uptake in cereals such as maize, wheat, and sorghum.
- **Azotobacter spp.**: Non-symbiotic nitrogen-fixing bacteria suitable for a wide variety of crops, including vegetables and sugarcane.
- **Frankia spp.**: Forms nitrogen-fixing nodules in non-leguminous trees like Casuarina and Alnus.

2. Phosphate-Solubilizing Microbes (PSM)

These microbes release bound phosphates in the soil, increasing phosphorus availability for plants.

- **Bacillus subtilis**: Effective for cereals, vegetables, and horticultural crops.
- **Pseudomonas fluorescens**: Promotes root development and enhances phosphorus uptake in diverse crops.
- **Penicillium spp.**: Efficient fungal phosphate solubilizers for horticultural crops and fruit plants.
- **Aspergillus niger**: Commonly used for soil amendment in a variety of farming systems.

3. Potassium-Mobilizing Microbes

These microbes solubilize potassium minerals, making them available for plant absorption.

- **Frateuria aurantia**: Widely used in crops like paddy, sugarcane, and vegetables.
- **Bacillus mucilaginosus**: Enhances potassium mobilization in cereals and oilseeds.

4. Plant Growth-Promoting Rhizobacteria (PGPR)

PGPR enhance plant growth through mechanisms like hormone production, stress tolerance, and nutrient availability.

- **Bacillus amyloliquefaciens**: Promotes root elongation and disease resistance.
- **Pseudomonas putida**: Enhances nutrient uptake and suppresses root pathogens.
- **Burkholderia cepacia**: Effective in improving growth under stress conditions like drought and salinity.
- **Acinetobacter calcoaceticus**: Promotes growth in a variety of crops through auxin production.

5. Mycorrhizal Fungi

Mycorrhizal fungi form symbiotic relationships with plant roots, improving water and nutrient absorption.

- **Arbuscular Mycorrhizal Fungi (AMF)**: Widely used for improving phosphorus uptake in cereals, pulses, and fruit crops.
- **Ectomycorrhizal Fungi**: Commonly associated with forest trees like pines and eucalyptus.

6. Bio-Pesticides

Bio-pesticides are natural agents used to control pests and diseases, reducing reliance on chemical pesticides.

- **Trichoderma viride**: Controls soil-borne pathogens like *Fusarium* and *Rhizoctonia*.
- **Bacillus thuringiensis (Bt)**: Targets larvae of pests such as caterpillars and moths in vegetable and cotton crops.
- **Metarhizium anisopliae**: Fungal bio-pesticide effective against soil-dwelling insects like termites.
- **Beauveria bassiana**: Controls whiteflies, aphids, and thrips in horticulture.

7. Bio-Control Agents

These microbes protect crops by suppressing harmful pathogens and diseases.

- **Pseudomonas fluorescens**: Controls bacterial wilt and fungal pathogens in tomatoes and brinjals.
- **Trichoderma harzianum**: Suppresses damping-off disease in seedlings and root rot in

various crops.

- **Bacillus subtilis**: Works as both a bio-pesticide and a biocontrol agent.

8. Decomposer Microbes

Decomposer microbes aid in breaking down organic material, turning agricultural waste into nutrient-rich compost.

- **Cellulomonas spp.**: Breaks down cellulose in crop residues.
- **Bacillus licheniformis**: Aids in degrading lignin and hemicellulose.
- **Aspergillus terreus**: Effective in composting organic waste rapidly.

9. Stress-Tolerant Microbes

These microbes help plants survive in extreme conditions like drought, salinity, or poor soils.

- **Halotolerant Bacillus spp.**: Enhances plant growth in saline soils.
- **Pseudomonas stutzeri**: Improves water uptake in drought-prone conditions.
- **Rhizobium sp. (Stress-Adapted)**: Ensures nitrogen fixation in sub-optimal environments.
- **Arthrobacter spp.**: Survives in acidic and nutrient-deficient soils, aiding plant growth.