# Azo-Bio-Com

*(Azospirillum)*

**Azo-Bio-Com**

Azo-Bio-com is produced from Azospirillum, a free-living soil bacterium that has the ability to affect the growth of numerous agricultural crops worldwide through the excretion of various hormones and the bacteria's ability of nitrogen fixation.

| Dosage | Packing | Shelf Life |
|---|---|---|
| 3 Liters / ha | 500ml, 1 Litre, 5 Litres | One Year |

**Mode of Action:** Azospirillum is capable of promoting growth of plants through the secretion of phytohormones, the most common being Indole Acetic Acid (IAA). IAA along with various other phytohormones alters the metabolism and the morphology of the plant room system in favor of better mineral and water adsorption. Azospirillum is capable of fixing nitrogen through assimilation of ammonium and the activity of nitrogenase.

**Seed Treatment:** Mix 10 ml of Azo-Bio-com with 1 kg of seeds and moisturize with cooled rice gruel or water and leave it for 30 minutes and sow the seeds.

**Root dipping:** The root of seedlings should be treated with 1 % solution (10ml/litre) of Azo-Bio-com for at least 10 minutes before plantation. Prolonged dipping or soaking is acceptable and it will enhance the efficiency.

**Soil application:** 1 litre of Azo-Bio-com is recommended per acre. Mix the desired volume with 50 – 100 kg of farmyard manure or sand and broadcast it in the field. Azo-Bio-com can also be applied through drip irrigation.

**Spray:** Foliar and bunch spray can be done. Spray the Azo-Bio-com at 0.5 – 2.0% concentration (5ml – 20 ml / litre of water) at regular interval of 1 month after transplantation.

**Content:** Azospirillum ($2 \times 10^{9}$ cfu / ml)

**Caution:** Do not mix with chemical fungicides or fertilizers.

# *Azo-Bio-Com* *(Azospirillum)*

## Recommended Crops

| Crops | | METHOD OF APPLICATION |
|---|---|---|
| **Cereals & Millets:** | Wheat, Rice, Teff, Barley, Maize, Corn, Sorghum, Pearl millets | **Seed Treatment** |
| **Legumes & Pulses:** | Black Gram, Green Gram, Cicer, Cowpea, Chickpea | |
| **Oil Seeds:** | Groundnut & Soyabean | |
| **Vegetables:** | French Bean, Cowpea | |
| **Other Crops: Vegetables- Cole Crops:** | Lettuce, Cabbage, cauliflower, Broccoli | **Root Dipping For Transplantation** |
| **Tuber Vegetables:** | Carrot, Beetroot, Potato | |
| **Tropical:** | Brinjal, Capsicum, Guards, Melons, Gharkin and Other Cucurbits | |
| **Tropical Tuber:** | Cassava, Sweet Potato | **Soil Application** |
| **Fiber Crops:** | Cotton, Sisal | |
| **Herbs & Spices:** | Chiles, Cumin, Cardamom, Basil | **Drip Systems** |
| **Cutting:** | Ginger, Sweet flag, Black Pepper, vanilla | |
| **Trees:** | Clove, Nut-mug, Cinnamon | **Tree Treatment** |
| **Beverage:** | tea, Coffee, Coco | |
| **Ornamental-Seed & Seedlings:** | Carnation, Petunia, Geranium, Chrysanthemum, Roses & Lilies | |
| **Fruit & Orchards:** | Grapes, Pineapple, Banana, Strawberry, Persian Fruit | |
| **Trees:** | Mango, Citrus, Plums, Apple | |

# Azoto-Bio-Com

*(Azotobacter)*

**Azoto-Bio-Com**

Azoto-Bio-com is produced from Azotobacter, a free-living, nitrogen-fixing bacterium. In contrast to Rhizobium species, they normally fix molecular nitrogen from the atmosphere without symbiotic relations with plants, although some Azotobacter species are associated with plants.

| Dosage | Packing | Shelf Life |
|---|---|---|
| 3 Liters / ha | 500ml,1 Litre, 5 Litres | One Year |

**Mode of action:** Azotobacter can fix the atmospheric nitrogen, solubilizes insoluble phosphate and also synthesizes some biologically active substances, including some phytohormones such as auxins, Indole Acetic Acid, cytokinin and Gibberrillin and thereby stimulating plant growth. Further, the organism can produce siderophores, antimicrobial agents and defense enzymes.

**Seed Treatment:** Mix 10 ml of Azoto-Bio-com with 1 kg of seeds and moisturize with cooled rice gruel or water and leave it for 30 minutes and sow the seeds.

**Root dipping:** The root of seedlings should be treated with 1 % solution (10ml/litre) of Azoto-Bio-com for at least 10 minutes before plantation. Prolonged dipping or soaking is acceptable and it will enhance the efficiency.

**Soil application:** 1 litre of Azoto-Bio-com is recommended per acre. Mix the desired volume with 50 – 100 kg of farmyard manure or sand and broadcast it in the field. Azoto-Bio-com can also be applied through drip irrigation.

**Spray:** Foliar and bunch spray can be done. Spray the Azoto-Bio-com at 0.5 – 2.0% concentration (5ml – 20 ml / litre of water) at regular interval of 1 month after transplantation.

**Content:** Azotobacter ($2 \times 10^9$ cfu / ml)

**Caution:** Do not mix with chemical fungicides or fertilizers.

# *Azoto-Bio-Com* *(Azotobacter)*

## Recommended Crops

| Crops | | METHOD OF APPLICATION |
|---|---|---|
| **Cereals & Millets:** | Wheat, Rice, Teff, Barley, Maize, Corn, Sorghum, Pearl millets | **Seed Treatment** |
| **Legumes & Pulses:** | Black Gram, Green Gram, Cicer, Cowpea, Chickpea | |
| **Oil Seeds:** | Groundnut & Soyabean | |
| **Vegetables:** | French Bean, Cowpea | |
| **Other Crops: Vegetables- Cole Crops:** | Lettuce, Cabbage, cauliflower, Broccoli | **Root Dipping For Transplantation** |
| **Tuber Vegetables:** | Carrot, Beetroot, Potato | |
| **Tropical:** | Brinjal, Capsicum, Guards, Melons, Gharkin and Other Cucurbits | |
| **Tropical Tuber:** | Cassava, Sweet Potato | **Soil Application** |
| **Fiber Crops:** | Cotton, Sisal | |
| **Herbs & Spices:** | Chiles, Cumin, Cardamom, Basil | **Drip Systems** |
| **Cutting:** | Ginger, Sweet flag, Black Pepper, vanilla | |
| **Trees:** | Clove, Nut-mug, Cinnamon | **Tree Treatment** |
| **Beverage:** | tea, Coffee, Coco | |
| **Ornamental-Seed & Seedlings:** | Carnation, Petunia, Geranium, Chrysanthemum, Roses & Lilies | |
| **Fruit & Orchards:** | Grapes, Pineapple, Banana, Strawberry, Persian Fruit | |
| **Trees:** | Mango, Citrus, Plums, Apple | |

# Phospho-Bio-Com

*(Bacillus megaterium var. phosphaticum)*

**Phospho-Bio-Com**
Phospho-Bio-Com is produced from Phospahte Solubilizing Bacterium (PSB).

| Dosage | Packing | Shelf Life |
|---|---|---|
| 3 Liters / ha | 500ml,1 Litre, 5 Litres | One Year |

**Mode of action:** Phosphate Solubilization takes place through various micrbial processes/mechanisms. Inorganic P is solubilized by the action of organic and inorganic acids secreted by PSB. Inorganic acids produced by PSB solubilize insoluble phosphates by lowering the pH. Inorganic acids can also solubilize phosphate but they are less effective compared to organic acids at the same pH

**Mineralization of organic P**

Prganic P may constitute 4-90% of total soil P. Alkaline and acid phosphatases use organic phosphate as a substrate to convert it into inorganic form. Release of organic anions, and production of siderophores and acid phosphates by plant roots/microbes or alkaline phosphatase enzymes hydrolyze the soil organic P or split P from organic residues.

**Method of Application:**

**Seed Treatment:** Mix 10ml of Phospho-Bio-com with 1kg of seeds and moisturize with cooled rice gruel or water and leave it for 30minutes and sow the seeds.

**Root dipping:** The root of seedings should be treated with 1% solution (10ml/litre) of Phospho-Bio-com for at least 10 minutes before plantation. Prolonged dipping or soaking is acceptable and it will enhance the efficiency.

**Soil application:** 1 litre of Phospho-Bio-com is recommended per acre. Mix the desired volume with 50-100 kg of farmyard manure or sand and broadcast in the field. Phopho-Bio-com can also be applied through drip irrigation.

**Content:** Phosphate Solubilizing Bacteria ($2*10^9$ cfu/ml)

**Caution:** do not mix chemical fungicides or fertilizers.

# *Phospho-Bio-Com* *(Bacillus megaterium var. phosphaticum)*

## Recommended Crops

| Crops | | METHOD OF APPLICATION |
|---|---|---|
| **Cereals & Millets:** | Wheat, Rice, Teff, Barley, Maize, Corn, Sorghum, Pearl millets | **Seed Treatment** |
| **Legumes & Pulses:** | Black Gram, Green Gram, Cicer, Cowpea, Chickpea | |
| **Oil Seeds:** | Groundnut & Soyabean | |
| **Vegetables:** | French Bean, Cowpea | |
| **Other Crops: Vegetables-Cole Crops:** | Lettuce, Cabbage, cauliflower, Broccoli | **Root Dipping For Transplantation** |
| **Tuber Vegetables:** | Carrot, Beetroot, Potato | |
| **Tropical:** | Brinjal, Capsicum, Guards, Melons, Gharkin and Other Cucurbits | |
| **Tropical Tuber:** | Cassava, Sweet Potato | **Soil Application** |
| **Fiber Crops:** | Cotton, Sisal | |
| **Herbs & Spices:** | Chiles, Cumin, Cardamom, Basil | **Drip Systems** |
| **Cutting:** | Ginger, Sweet flag, Black Pepper, vanilla | |
| **Trees:** | Clove, Nut-mug, Cinnamon | **Tree Treatment** |
| **Beverage:** | tea, Coffee, Coco | |
| **Ornamental-Seed & Seedlings:** | Carnation, Petunia, Geranium, Chrysanthemum, Roses & Lilies | |
| **Fruit & Orchards:** | Grapes, Pineapple, Banana, Strawberry, Persian Fruit | |
| **Trees:** | Mango, Citrus, Plums, Apple | |