Revolutionary Biological Solutions for Agriculture
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International Panaacea Limited (IPL) is a M2K Group company, having corporate office at Gurugram (HR), providing solutions to Agricultural problems through biologicals since 1994, through its strong, knowledgeable & experienced R&D and Marketing team. International Panaacea Limited (IPL) has skilled and experienced technical expert team which offer solutions for specific needs of customers in crop production programme, training, supervision and through demonstration.

We work towards a safer and healthier planet by leveraging our research capabilities and bringing sustainable, safe, technological solutions to consumers globally.

Ethics: We conduct ourselves and our business affairs in accordance with the highest ethical standards
Quality: We take responsibility for quality. Our product and services will be amongst the best in terms of value delivered. Each of us is responsible for the quality of whatever we do.
Long term: We base our decisions on maximizing the long term success of our company.
Customer First: We will work towards a customer focussed organisation, keeping the customer front at centre in all we do.
Ownership: Each individual doing what it takes to win.

International Panaacea Limited (IPL) has two world class R&D centres in India with modern and state of art facility recognized by Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology, India. These centres are fully engaged in developing various new products based on microbes in different fields and has commercialized over 50 products, and have 70 new products in the pipeline. The R & D works on the principle of finding solutions through Biologicals and creating a chemical free environment friendly solutions.
International Panaacea Limited (IPL) has a state of art manufacturing unit located at Haridwar. International Panaacea Limited (IPL) production facility is well equipped with modern equipments and has well established systems and stringent procedures to ensure quality for all inputs & final product.

International Panaacea Limited (IPL) is enthusiastic in marketing of their products all over the world for various crops disease/pest & soil health management. Our products have been tested in Spain, Italy, France, Kenya, UK, Brazil, Italy, Turkey, Afghanistan, Russia, Nepal, Bangladesh, Pakistan, Malaysia, Philippines, U.S, Mexico, Chile, Morocco, China, Sweden, Ukraine and shown good results. International Panaacea Limited (IPL) products have been used successfully on various crops throughout the world including Cereals, Oil seeds, Pulses, Vegetables, Horticulture crops and Cash crops.

PRODUCTION

INTERNATIONAL PRESENCE

Biggest Products Range

Nutrient Management
Disease Management
Insect/Pest Management
Seed treatment
Growth Promoters
Decomposers

High CFU and longer shelf life
Cost effective & environment friendly solution
Bio-pesticides registered at CIB & RC
Bio-fertilizers as per FCO
All Products are certified by INDOCERT & IMO for Organic agriculture
Nationwide network of Distributors
Biological Fertilizers

PREMIUM AZOTO

Azotobacter spp.

CFU $5 \times 10^7$ per gm | CFU $1 \times 10^8$ per ml

Nitrogen for All Crops

Mode of Action
- Premium Azoto fixes the atmospheric nitrogen and reduces the amount of Nitrogenous chemical fertilizer (Urea).
- It also improves soil fertility and inhibits the growth of harmful pathogens and results in lowering the incidence of disease.

Benefits
- Improves percentage of seed germination
- Increases root surface area
- Helps to fix atmospheric nitrogen continuously
- Reduction in disease incidence, results in higher yield.

Target Crops
Wheat, Maize, Millet, Cotton, Grapes, Banana, Pomegranate, Orange, Paddy, Vegetables & Plantation Crops, Fibre and Oil Producing Crops.

Application
- SEED
- SOIL
- SEEDLING
- DRIP

- Nitrogen ($N_2$) from air
- Bacterium

- Powder
- Granule
- Liquid
- Liquid
- Powder
### PREMIUM PHOSTER
**Phosphate Solubilizing Bacteria**

**Mode of Action**
- Phoster is a product of effective phosphate solubilizing microbes which are capable of hydrolysing organic and inorganic phosphorus from insoluble compounds and make it available for the plants.
- It is associated with the release of low molecular weight organic acids through which they convert insoluble form of phosphate into soluble forms thereby reducing the dependence on chemical fertilizers (DAP/SSP)

**Benefits**
- Encourages faster root growth for water and nutrient uptake.
- Produce organic acids which fastens the P$_2$O$_5$ and micronutrients uptake and increases yield.
- Increases resistance to diseases
- Increases drought tolerance
- Reduces the requirement of phosphate fertilizer requirement by 25% - 30%

**Target Crops**

**Application**
- **SOIL**
- **Liquid**
- **Granule**

### PREMIUM POTASH ACTIVA
**Potash Mobilizing Bacteria**

**Mode of Action**
- Potash Activa has microbial population which helps the plant to get potassium from the soil through biological activity.
- It mobilises the potassium by secreting organic acids which enhance the plant growth.

**Benefits**
- Improves disease and stress tolerance
- Improves crop growth and yield
- Enhances soil fertility
- Reduces requirement of potash application by 50% - 60%

**Target Crops**
Paddy, Wheat, Millet, Tea, Cabbage, Cauliflower, Pea, Bean, Brinjal, Chilly, Onion, Potato, Leafy Vegetables, Tomato, Grapes, Citrus, Apple, Flowering Plants and Sugarcane.

**Application**
- **SOIL**
- **DRIP**
- **Liquid**
- **Granule**
- **WP**
**BIO-NPK**

Nitrogen, Phosphorus, Potassium

CFU $5 	imes 10^7$ per gm I CFU $1 	imes 10^8$ per ml

**NPK fo all Crops**

**Mode of Action**
- Bio-Npk is a microbial formulation which is able to fix atmospheric nitrogen, Solubilize phosphate and mobilize potash into available form, thereby supplementing balance nutrition to the crops.
- It converts non-available forms of some tightly bonded micro nutrients into available form.

**Benefits**
- Increases utilization of atmospheric nitrogen.
- Solubilizes unavailable form of phosphate.
- Mobilizes and fixes the left over potash in the soil
- Increases yield and quality of the produce
- Increases drought tolerance and reduces disease infestation

**Target Crops**

**Application**

- [DRIP](#)
- [SOIL](#)
- [SPRAY](#)

**PREMIUM ZINC ACTIVATOR**

Zinc Solubilizing Bacteria

CFU $1 	imes 10^8$ per ml

**Improve Soil & Plant Health**

**Mode of Action**
- Zinc Activa produces organic acids and converts insoluble form of zinc available in nature e.g. zinc sulphide, zinc oxide and zinc carbonate and makes it available to the plants by lowering the soil pH and breaking down the complexity and thereby increasing the crop yield and soil health.

**Benefits**
- Increases crop yield and quality of produce
- Improves soil health and activates hormones
- Improves photosynthetic activity leading to higher plant growth
- Controls khera disease in paddy

**Target Crops**
Paddy, Maize, Cotton, Vegetables and Fruits.

**Application**

- [DRIP](#)
- [SOIL](#)

- [Liquid](#)
- [Powder](#)
- [Granule](#)
SIRON
Sulphur & Iron Solubilizing Bacteria
CFU > 1 x 10⁸ per gm

Mode of Action
• Consists of Iron and sulphur mobilizing bacteria which produces organic acids and converts the insoluble form of Iron and sulphur into available form through lowering the soil pH and breaking down the complex.
• Iron and sulphur are the most important nutrient requirements of the plant that is fulfilled through the application of Siron.

Benefits
• Converts insoluble form of “S” and “Fe” into soluble form for absorption in plants
• Helps to maintain the soil pH
• Increases numbers of flowers, fruits, grain formation and their size
• Plays an important role in plant respiration process

Target Crops
Suitable for Oil Seeds Crops, Pulses, Cereals, Fruit & Vegetable Crops, Spices Including Medicinal and Aromatic Crops, Tea and Coffee.

Application
SOIL

VAM SHAKTI, VAMLET & VAM-HD
Vesicular Arbuscular Mycorrhiza (VAM)
CFU 100 Propagules per gm | 1000 Propagules per gm

Mode of Action
• VAM accumulates phosphate through its vesicle and arbuscules and can travel far from the plant roots in search of phosphate resources. It penetrates into the plant root cells, producing balloon like vesicles.
• Management of VAM fungi enhances phosphate uptake and mobilize immobile micronutrient like Fe, Mn, Zn, Cu, Bi, Mo and Mg besides these, it imparts resistance to plant against drought, soil born fungal pathogens and nematodes.
• Get essential plant nutrient beyond nutrient depleting zone.

Benefits
• Improves plant root growth and development
• Increases mobilization and uptake of phosphate and minerals
• Effective in overcoming the stress conditions like drought, cold and disease incidence

Target Crops

Application
SOIL

Tablet
Granule
Powder
**CANE MASTER**
Acetobacter (Glunoacetobacter diazotrophicus)

**Mode of Action**
- Cane Master is a microbial population of a nitrogen fixing bacteria (Glunoacetobacter diazotrophicus) which is capable of fixing atmospheric nitrogen in roots, stems and leaves of sugarcane plants.
- It promotes root proliferation and increases the number of rootlets, resulting in uptake of mineral and overall growth of plants.

**Benefits**
- Promotes plant growth by colonizing their internal tissues in sugarcane and coffee
- N2 fixation
- Increases tolerance to low pH, higher sugar recovery and salt concentrations

**Target Crops**
Sugarcane, Ginger, Garlic, Fruits, Tea and Vegetables.

**Application**
- SEEDLING
- SOIL

**PREMIUM RHIZO**
Rhizobium spp.

**Mode of Action**
- Premium Rhizo is a product of nitrogen fixing bacteria (Rhizobium spp.) which infect the legume root and form root nodules within which they reduce molecular nitrogen into ammonia which is readily converted into nitrogen containing compounds.
- It has been estimated that 40-50 Kg/ha/year is fixed by different legume crops by the microbial activities of Rhizobium.

**Benefits**
- Fixes nitrogen in soil
- Improves soil fertility for next crop
- Helps in liberation of micro nutrients from insoluble sources

**Target Crops**
Leguminous Crops Like Pea, Pigeon Pea, Black Gram, Green Gram, Chick Pea, Cow Pea, Soyabean, Peanut, Arhar, Lentil, Berseem.

**Application**
- SEED
- SOIL
- Liquid
**Biological Fungicides**

**SANJEEVNI & BIOHARZ**

*Trichoderma viride & Trichoderma harzianum*

CFU $2 \times 10^6$ per gm  
CFU $2 \times 10^6$ per ml

**Effective control of Seed & Soil borne Diseases**

**Mode of Action**
- It invades plant pathogenic fungi by secreting lytic enzymes and feeds on them till death.
- It also helps in plant growth promotion by supplying essential nutrients such as nitrogen, phosphorous, calcium, copper, molybdenum, magnesium, zinc, iron and very important source of water. It has the ability to solubilize Manganese.

**Benefits**
- A natural bio-fungicide, highly effective in controlling wide range of soil borne diseases caused by Fusarium, Rhizoctonia, Pythium, Sclerotinia, Verticillium.

**Target Crops**
Cereals, Pulses, Oil Seeds, Cotton, Capsicum, Chilllies, Cauliflower, Brinjal, Tomato, Potato, Onion, Peas, Beans, Ginger, Turmeric, Cardamom, Tea, Coffee, Apple, Citrus, Grapes, Pomegranate, Banana.

**Application**
- **NURSERY**
- **SEED**
- **SEEDLING**
- **SOIL**

**Powder**

**Liquid**

[Images of Powder and Liquid products]
PHASAL RAKSHAK & BACTVIPE

**Pseudomonas fluorescens**

CFU 2 x 10^8 per gm I CFU 2 x 10^6 per ml

**Effective control of Seed, Soil & Air borne Diseases**

**Mode of Action**

- *Pseudomonas fluorescens* utilizes seed and root exudates to multiply in the rhizosphere of the soils.
- It also produces siderophore which chelate with iron in the soil, and make it difficult for the pathogens to proliferate.
- It secretes several plant growth substances, and these gibberellins like compounds contribute to vigorous and inhibit the growth of disease causing pathogens.
- It induce systemic resistance in host plant and also produce secondary metabolite (2, 4 - DAPG) 2, 4 - diacetyl phloroglucinol which is responsible for antiphyto pathogenic and bio control properties.

**Benefits**

- Highly effective to control diseases like Root rot, Stem rot, Collar Rot, Wilt, Blights, Leaf spots, Anthracnose, Alternaria and Downy & Powdery mildew

**Target Crops**


**Application**

- NURSERY
- SEEDLING
- SEED
- SOIL
- DRIP
- SPRAY

MILGO

**Ampelomyces quisqualis**

CFU 2 x 10^8 per ml

**Effective control of Powdery Mildew**

**Mode of Action**

- Ampelomyces quisqualis is a hyper parasite which penetrates the hyphal wall of a host cell and grows inside causing degradation of the cytoplasm thereby kills the pathogen.
- They are very specific to powdery mildew fungus and hence acts as an effective biocontrol for powdery mildews.

**Benefits**

- Controls hyper parasite of powdery mildew
- Reduces growth of hyper parasite.

**Target Crops**

Wide range of Powdery Mildew affected Crops Like Cucubits, Grapes, Apple, Peas, Beans, Tomato, Pulses, Cumin, Chilies, Coriander, Mango, Ber, Strawberry, Medicinal and Aromatic Crops & Roses.

**Application**

- SPRAY
**MILDOWN**  
*Bacillus subtilis*  
CFU 2 x 10⁶ per ml

**Effective control of Downy Mildew & other Diseases**

**Mode of Action**
- *Bacillus subtilis* colonize the developing root system, competing with disease organisms that attack root systems. It inhibits plant pathogen spore germination, disrupts germ tube growth and interferes with the attachment of the pathogen to the plant.
- It is also reported to induce systemic acquired resistance (SAR) against bacterial pathogens.
- It produces a class of lipopeptide antibiotics including Iturin. Which out complete the micro-organism by either killing them or reducing their growth rate. Iturin also have direct fungicidal activity in pathogen.

**Benefits**
- It is a rhizosphere and phyllosphere colonizing bacterium
- It control seed, soil and air borne fungal diseases

**Target Crops**
Oil Seeds, Cotton, Tomato, Pea, Beans, Millet, Pulses, Onion, Garlic, Basil, Cucurbita, Mango, Grapes, Ginger, Citrus, Cereal, Corn, Apple, Pomegranate, Peach, Plum.

**Application**
- **Spray**
- **Soil**

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**INTERNAL TRIAL RESULTS**

**Crop : Cotton**

**Products :** Premium Azospi, Premium Phosphofix, Premium Azotoplus, Premium Rhizobium.

**Benefits :**
- Better plant growth
- Early flowering
- More number of cotton bolls

**Crop : Tea**

**Products :** Sanjeevni, Vam Shakti & Potash Activa

**Benefits :**
- Better growth
- Healthy plants
- Nutrients availability
- Disease free crop

**Crop : Grape**

**Products :** Milgo & Bactvipe

**Benefits :**
- Powder mildew free
- Healthy Crop
- Higher yield
Mode of Action

- Beauveria bassiana conidia infect the insect skin by penetrating and lysing (with enzymes) the epicuticle. Once inside the insect it grows and releases toxin Beauvericin and Oosporin that weakens the host’s immune system.
- Eventually the entire body cavity is filled with fungal mass. Insects, before succumbing to fungal infection, exhibit various symptoms including restlessness, cessation of feeding and loss of co-ordination.

Benefits

- Highly active on Lepidopterous Caterpillars, including Helicoverpa, Spodoptera, Borers, Semiloopers and Hairy Caterpillars of vegetables and fruits.

Target Crops

Cereals, Pulses, Oil Seeds, Cotton, Brinjal, Tomato, Cabbage, Cauliflower, Fruits and Plantation a Crops.

Application

<table>
<thead>
<tr>
<th>Powder</th>
<th>Liquid</th>
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<tr>
<td>SPRAY</td>
<td>SOIL</td>
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Biological Insecticides

DAMAN & DAMAN-L
Beauveria bassiana
CFU 2 x 10^8 per gm | CFU 2 x 10^9 per ml

Effective control of Root Borer, Caterpillars & Sucking Pests
**KALICHAKRA & KALICHAKRA-L**

Metarhizium anisopliae  
CFU $2 \times 10^8$ per gm / CFU $2 \times 10^8$ per ml  

**Effective control of Root Grub, Termites & Sucking Pests**

**Mode of Action**
- The spores / mycelia of Metarhizium when comes in contact with the insect body and colonize the host body thereby killing it.
- Destruxins produced by the fungus eventually weakens and kills the insect. Complete colony gets killed once a single insect is infected.

**Benefits**
- Controls egg, larval, pupal, nymphal and adult stages of White grubs, Beetle, Cutworms, Termites and Sucking pests like Pyrilla, Mealy bugs and Aphids

**Target Crops**
Maize, Cotton, Sugarcane, Tomato, Potato, Barley, Groundnut, Paddy, Sorghum, Soyabean, Vegetables And Fruit Crops.

**Application**
- [SPRAY](#)
- [SOIL](#)

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**MAHASTRA**

Bacillus thuringiensis  
CFU $1 \times 10^{11}$ per gm  

**Effective control of Caterpillars**

**Mode of Action**
- Bacillus thuringiensis infects insect species of the orders Lepidoptera, Diptera, Coleoptera etc by releasing Cry proteins which when inserted into the insect gut cell membrane, paralyzes the digestive tract and forming pores in microvilli of apical membranes.
- Subsequently cell lysis and disruption of the midgut epithelium releases the cell contents providing spores a germinating medium leading to a severe septicemia and insect straves to death.

**Benefits**
- Effective against all Lepidopteran caterpillars

**Target Crops**
Tomato, Cabbage, Cauliflower, Brinjal, Cotton, Pulses, Paddy, Chilli, Okra, Tea.

**Application**
- [SPRAY](#)

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**Different stages of whitegrub**

**White grubs**

**Termites**

**Lepidopteran caterpillars**

**Liquid**  
**Powder**

**Powder**
**VARUNASTRA**
Verticillium lecanii
CFU 2 x 10^6 per ml

**Effective control of Waxy Skin Insects & Sucking Pests**

**Mode of Action**
- *Verticillium lecanii* fungus produces several toxins like bassianolide and other insecticidal toxins such as dipicolinic acid, which infect aphids, whiteflies, scale insects and causes mortality.
- The spores of this fungus when come in contact with the cuticle (skin) of target insects, they germinate and grow directly through the cuticle to the inner body of their host. *Verticillium lecanii* proliferates throughout the insect’s body, draining the insect of nutrients and eventually killing it in around 48-72 hours.

**Benefits**
- Effective against all soft bodies sucking insect like Aphids, Thrips, Mealy bugs, White flies, Jassids, Hoppers, Scales and all types of Mites

![Thrip](Image1) ![Jassids](Image2) ![Mealy bug](Image3)
![White flies](Image4) ![Scales](Image5) ![Hopper](Image6)

**Target Crops**
Banana, Grapes, Guava, Citrus, Mango, Sapota, Apple, Coconut, Paddy, Cotton, Tomato, Chilly, Brinjal, Onion, Okra, Tea, Coffee, Cardamom, Aromatic and Medicinal Crops.

**Application**
- SPRAY

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**NEMATOFREE+**
Verticillium chlamydosporium (Pochonia chlamydosporia)
CFU 2 x 10^6 per gm

**Effective control of Nematodes**

**Mode of Action**
- *Paecilomyces lilacinus* on getting attached to the target pest i.e. nematodes forms a heavy mycelium that gives rise to conidiophores.
- It produces hyphae inside nematode body which proliferate and start feeding on nematode internal contents and produces a serine protease that is toxic to nematode eggs and produces enzymes like proteases and chitinase enzymes that weakens nematodes

**Benefits**
- Effective against nematode (Meloidogyne spp.), Reniform nematode (Rotylenchulus spp.) Citrus nematode, Radopholus spp.

![Nematode affected roots](Image7)

**Target Crops**
Wheat, Paddy, Citrus, Banana, Papaya, Potato, Okra, Tomato, Tea, Coffee, Blackpepper, Pomegranate, cucumber.

**Application**
- NURSERY
- SEEDLING
- DRIP
- SOIL
**ALMITE**

Hirsutella thompsonii

CFU 2 x 10⁶ per ml

**Effective control of Mites**

**Mode of Action**

- Hirsutella thompsonii contains protein which cause detectable cytopathic effects on insects within 24-48 hrs and completely inhibited cell growth at 4 days post treatment thereby stops the insects multiplication.
- Hirsutellin is a mycotoxin of an invertebrate mycopathogen which acts against the pest.

**Benefits**

- Controls pink, yellow and red mites in tea, rose, fruits, vegetables and plantation crops.

*Target Crops*


**Application**

**SPRAY**

![Liquid](image)

---

**NEEM KAVACH**

Azadirachtin

1500 PPM (0.15% EC)

**Effective control of Sucking Insects**

**Mode of Action**

- Antifeedant, antioviposition, insecticidal, repellant action.

**Benefits**

- Controls whiteflies, aphids, thrips, caterpillars, beetles, mealy bugs

*Target Crops*

Tomato, Cabbage, Cauliflower, Cotton, Pulses, Paddy, Chilli, Okra, Tea, Mustard, Fruits Crops.

**Application**

**SPRAY**

![Liquid](image)
### WIPE OUT
Consortium of Fatty Acids

**Mode of Action**
- WIPE OUT is a consortium salt of fatty acids which acts on the exoskeleton and cell membrane of insects that dissolve the exoskeleton and disrupt the lipoprotein matrix of the cell membrane, the cell membrane content move out and insect die of dehydration. It is used to activate the activities of other bio-insecticide on target pest as tank mix.

**Benefits**
- It is effective against all type of insect pest e.g. Mealy bug, Whitefly, Aphids, Jassids, Thrips, Scale insect, Caterpillar, Psyllids, Lace Bug, Spider mite of various crops.

**Target Crops**
All type of Crops.

**Application**
- **Spray**

### INTERNAL TRIAL RESULTS

**Crop**: Tomato

**Products**: Nematofree+

**Benefits**:
- Nematodes free crop
- Healthy plants
- Higher yield

**Crop**: Cotton

**Products**: Phoster, Sanjeevni & Phasal Rakshak

**Benefits**:
- Healthy growth
- No wilting and dying of plants
- Availability of all nutrients

**Crop**: Paddy

**Products**: Vam-HD

**Benefits**:
- Healthy growth
- No wilting and dying of plants
- Availability of all nutrients
Other Biological Products

PREMIUM DECOMPOSER
Microbial Formulation for Compost Production

**Faster Decomposition of Residues**

**Mode of Action**
- It enhances the process of decomposition and release gases and heat.
- It break down the complexes and cellulose in plant debris.

**Benefits**
- Break down the remains of dead organism including animal waste into simpler substance to be used again by plants.
- Make the process of composting fast.
- Excrete the rest as nutrient into soil and gases such as nitrogen and carbon dioxide.

**Target Crops**
It can be used in decomposing Crop Stubble / Waste / Straw/green Biomass and Dung in open field in case of Banana, Sugarcane, Grapes, Paddy, Wheat, Pomegranate.
PREMIUM SURAKSHA
Plant Growth Promoting Rhizobacteria
CFU > 1 x 10^8 per ml

Growth Promotion

Mode of Action
- The Plant Growth Promoting Rhizobacteria (PGPR) colonize the root surface and closely adhere to soil interface, the Rhizosphere.
- They play a major role in synthesis of plant growth promoting substances and prevention of diseases.

Benefits
- Effective against root rot and stem rot caused by Sclerotinia, Rhizoctonia, Phythium, Phytophthora, Alternaria, Cercospora and Mildews
- Improves plant stress against drought, saline and alkaline conditions
- Produces phytohormones like IAA and Gibberlins for plant growth

Target Crops
Grapes, Banana, Pomegranate, Guava, Mango, Citrus, Chilly, Tomato, Brinjal, Okra, Tea, Coffee, Paddy, Wheat, Maize, Plantation Crop, Medicinal and Aromatic Crops.

Application
- SPRAY
- SOIL
- DRIP

5G
Natural Liquid Humic & Fulvic Fertilizer ‘5G’ with Natural Growth & Development, stimulator with Antistress, immune-modulator and adeptogenic properties.

Mode of Action
- 5G has a unique biological activity and prolonged action. It increases the productivity of different crops by 10-50%; decreases application rates of agrochemicals by 20-40%; removes stress from pesticides and agro-chemicals; maintains plant resistance to bacterial and fungi diseases as well as to drought. Over wetting, frosts and others; improves the production quality; maintains soil water-holding capacity and fertility; bonds pesticides residues, heavy metals, and radionuclides in soil; prevents their input into plants and soil – ground waters.

Benefits
- Enhances leaf size, color, flowering and fruiting
- Increases yield with larger and better quality fruits
- Improves vigour and resistance towards major diseases and insect attack
- Maximizes the stress tolerance of plants like water stress, dry, frost and temperature imbalances
- It stimulates overall plant growth and biomass development by accelerating cell division for thicker cell wall in fruits and vegetables for prolonged storage and shelf life
- Helps to eliminate chlorosis due to trace elements deficiency in plants
- Promote the development of chlorophyll, carbo-hydrates and amino acids in plants and aid in photosynthesis
- 5G improves overall the quality; improve their physical appearance and nutritional value

Target Crops
All type of Crops like ; Vegetables, Cereals, Fruits, Flowers and Ornamental Plants etc.

Application
- SPRAY

Liquid
Soil Detox Therapy

Mode of Action

- The beneficial fungi survives in soil and multiplies and enhances the nutrient uptake by maintaining the soil microbiome balance. It enhances the multiplication of beneficial microbes in the soil which in turn makes the soil healthy and fertile by helping plants in nutrients take up from the soil, these fungi can enhance crop yields, increase pest resistance, and reduce the need for fertilizer. Early application of ProTox precludes root colonization by pathogenic bacteria, which could also enhance resistance to diseases and pests.

Benefits

- It increases the nutrient uptake efficiency in plants.
- 15-20% of chemical fertilizers may be saved.
- 15-20% crop yield may be increased.

Target Crops

All type of crops like Cereals, Oil Seeds, Vegetables, Millets, Sugarcane, Tuber, Fruits and Ornamental crops.

Application

DRENCHING  SOIL

Liquid
HD Biological Fertilizers

NITROCEA-HD
Azotobacter Spp
CFU 5 x 10⁶ Cells / ml (Minimum)

Nitrogen Fixing Bacteria

Mode of Action
• The Nitrogen Fixing Bacteria in Nitrocea-HD improves soil fertility and inhibits the growth of pathogens and results in lowering the incidence of disease.

Benefits
• Improves germination % of seeds.
• Increases root surface area.
• Helps to fix atmospheric nitrogen continuously.
• Reduction in disease incidence, resulting in higher yield.

Target Crops
All type of crops like Paddy, Wheat, Cereals, Pulses, Vegetables and Horticultural crops.

Application
[Seeds, Seedling, Drip, Soil]
**PHOSPHOCEA-HD**

CFU $1 \times 10^{10}$ Cells / ml (Minimum)

### Phosphate Solubilising Bacteria

**Mode of Action**
- The Phosphorous Solubilising Bacteria in **Phosphocea-HD** secretes organic acids such as lactic, gluconic, fumaric, succinic and acetic acid, which converts insoluble tricalcium phosphate and rock phosphate into soluble form and other metabolically active Plant Growth Promoting (PGP) components that eventually improves overall plant health and productivity.

**Benefits**
- Encourages faster root growth for water and nutrient uptake.
- Produce organic acids which fastens the $\text{P}_2\text{O}_5$ and micronutrients uptake and increase yield.
- Increase resistance to diseases and drought tolerance.
- Reduce the requirement of phosphatic fertilizer by 25% - 30%.

**Target Crops**
All type of crops like Paddy, Wheat, Cereals, Pulses, Vegetables and Horticultural crops.

**Application**
- SEED
- SEEDLING
- DRIP
- SOIL

---

**POTAACEA-HD**

CFU $1 \times 10^{10}$ Cells / ml (Minimum)

### Potash Mobilising Bacteria

**Mode of Action**
- **Potaacea-HD** have very high microbial population which helps the plant to get potassium from the soil through biological activity. It mobilises the potassium by secreting organic acids which enhance the plant growth.

**Benefits**
- Improve disease and stress tolerance.
- Improve crop growth and yield.
- Enhance soil fertility.
- Reduces requirement of potash application by 50% - 60%.

**Target Crops**
All type of crops like Paddy, Wheat, Cereals, Pulses, Vegetables and Horticultural crops.

**Application**
- SEED
- SEEDLING
- DRIP
- SOIL
Mode of Action

- The Zinc solubilising bacteria in Zinkaacea-HD secretes certain organic acids such as lactic, gluconic, fumaric, succinic and acetic acid, which converts insoluble Zinc into soluble form.

Benefits

- Increase crop yield and quality of produce.
- Improves soil health and activates hormones.
- Improve photosynthetic activity leading to higher plant growth.
- Control Khaira disease in paddy.

Target Crops

All type of crops like Paddy, Wheat, Cereals, Pulses, Vegetables and Horticultural crops.

Application

- SEED
- SEEDLING
- DRIP
- SOIL

Zinkaacea-HD

Zinc Solubilising Bacteria

CFU 1 x 10^{10} Cells / ml (Minimum)
**INTERNAL TRIAL RESULTS**

**Crop : Grape**

**Products :** Nitrocea-HD  
**Benefits :**  
- Increases root surface area.  
- Helps to fix atmospheric nitrogen continuously.  
- Reduction in disease incidence, resulting in higher yield.

**Crop : Onion**

**Products :** Phosphocea-HD  
**Benefits :**  
- Encourages faster root growth for water and nutrient uptake.  
- Produce organic acids which fastens the $P_2O_5$ and micronutrients uptake and increase yield.  
- Increase resistance to diseases and drought tolerance.  
- Reduce the requirement of phosphatic fertilizer by 25% - 30%.

**INTERNAL TRIAL RESULTS**

**Crop : Chilli & Sugarcane**

**Products :** Potaacea-HD  
**Benefits :**  
- Improve disease and stress tolerance.  
- Improve crop growth and yield.  
- Enhance soil fertility.  
- Reduces requirement of potash application by 25% - 30%.

**Crop : Potato**

**Products :** Zinkaacea-HD  
**Benefits :**  
- Increase crop yield and quality of produce.  
- Improves soil health and activates hormones.  
- Improve photosynthetic activity leading to higher plant growth.
# Total Crop Management Chart

## Crop: Soyabean

<table>
<thead>
<tr>
<th>Disease/Pest</th>
<th>Field Preparation</th>
<th>Growth</th>
<th>Flowering</th>
<th>Maturity</th>
<th>Harvesting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrient Management</strong></td>
<td></td>
<td>PREMIUM PHOSPHOFIX</td>
<td>PREMIUM RHIZO</td>
<td>PREMIUM PHOSPHOFIX</td>
<td></td>
</tr>
<tr>
<td><strong>Soil Conditioner</strong></td>
<td></td>
<td>SANJEENVNI &amp; BACTVIPE</td>
<td></td>
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</tr>
<tr>
<td><strong>Disease Management</strong></td>
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</tr>
<tr>
<td>Root Rot*</td>
<td>SANJEENVNI &amp; MILDOWN</td>
<td></td>
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</tr>
<tr>
<td>Damping Off*</td>
<td>SANJEENVNI</td>
<td>SANJEENVNI</td>
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</tr>
<tr>
<td>Powdery Mildew*</td>
<td>PHOSPHOFIX+ SANJEENVANI+PR</td>
<td>MILGO</td>
<td>MILGO</td>
<td>MILGO</td>
<td></td>
</tr>
<tr>
<td>Downy Mildew*</td>
<td>PHOSPHOFIX+ SANJEENVANI+PR</td>
<td>BACTVIPE</td>
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</tr>
<tr>
<td>White Mould*</td>
<td>PHOSPHOFIX+ SANJEENVANI+PR</td>
<td>BACTVIPE</td>
<td>BACTVIPE</td>
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<tr>
<td>Cyst Nematode</td>
<td>NEMATOFREE+</td>
<td>BACTVIPE</td>
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</tr>
<tr>
<td>Root-knot Nematode**</td>
<td>NEMATOFREE+</td>
<td></td>
<td>NEMATOFREE+</td>
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</tr>
<tr>
<td>Green Semilooper*</td>
<td></td>
<td>MAHASTRA</td>
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<tr>
<td>Stem fly*</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
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<tr>
<td>White Fly*</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
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</tr>
</tbody>
</table>

**Remark:** Apply on early stage of disease appearance, Repeat application after 6-10 days if not control. **Apply before the appearance of pest or disease as per yearly presence of disease.
<table>
<thead>
<tr>
<th>Disease/ Pest</th>
<th>Field Preparation</th>
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<th>Flowering</th>
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<tbody>
<tr>
<td><strong>DISEASE MANAGEMENT</strong></td>
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</tr>
<tr>
<td>Downy mildew*</td>
<td>PHOSPHOFIX+ SNJ+PR+POT. ACTIVA</td>
<td>MILDOWN</td>
<td>MILDOWN</td>
<td>MILDOWN</td>
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<tr>
<td>Powdery mildew*</td>
<td>PHOSPHOFIX+ SNJ+PR+POT. ACTIVA</td>
<td>MILGO</td>
<td>MILGO</td>
<td>MILGO</td>
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</tr>
<tr>
<td>Black Rot*</td>
<td>PHOSPHOFIX+ SNJ+PR+POT. ACTIVA</td>
<td>MILDOWN</td>
<td>MILDOWN</td>
<td>MILDOWN</td>
<td>MILDOWN</td>
</tr>
<tr>
<td>Botrytis Rot/Grey Mould*</td>
<td>PHOSPHOFIX+ SNJ+PR+POT. ACTIVA</td>
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<td>SANJEEVNI &amp; BIOHARZ</td>
<td>SANJEEVNI &amp; BIOHARZ</td>
<td>SANJEEVNI &amp; BIOHARZ</td>
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<tr>
<td>Anthracnose*</td>
<td>PHOSPHOFIX+ SNJ+PR+POT. ACTIVA</td>
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<td>MILDOWN</td>
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<tr>
<td><strong>INSECT PESTS MANAGEMENT</strong></td>
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<tr>
<td>Root-knot Nematode**</td>
<td>NEMATOFREE+</td>
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<tr>
<td>Dagger nematode**</td>
<td>NEMATOFREE+</td>
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<tr>
<td>Mealy Bug*</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
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</tr>
<tr>
<td>Thrips and Hoppers*</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td>WIPEOUT &amp; VARUNASTRA</td>
<td></td>
</tr>
<tr>
<td>Grape rust mite*</td>
<td>WIPEOUT &amp; ALMITE</td>
<td>WIPEOUT &amp; ALMITE</td>
<td>WIPEOUT &amp; ALMITE</td>
<td>WIPEOUT &amp; ALMITE</td>
<td></td>
</tr>
</tbody>
</table>

Remark:* Apply on early stage of disease appearance, Repeat application after 6-10 days if not control. ** Apply before the appearance of pest or disease as per yearly presence of disease
# Total Crop Management Chart

**Crop: Coffee**

<table>
<thead>
<tr>
<th>Disease/Pest</th>
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<th>Flowering</th>
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<th>Harvesting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrient Management</strong></td>
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<td>PREMIUM AZOTO</td>
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<tr>
<td></td>
<td>PREMIUM PHOSPHOFIX</td>
<td>PREMIUM PHOSPHOFIX</td>
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</tr>
<tr>
<td><strong>Soil Conditioner</strong></td>
<td>SANJEEVNI &amp; BACTVIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Disease Management</strong></td>
<td>SANJEEVNI &amp; PHASAL RAKSHAK</td>
<td>SANJEEVNI &amp; PHASAL RAKSHAK</td>
<td>PHASAL RAKSHAK &amp; MILDOWN</td>
<td>PHASAL RAKSHAK &amp; MILDOWN</td>
<td>PHASAL RAKSHAK &amp; MILDOWN</td>
</tr>
<tr>
<td>Damping Off*</td>
<td>BACTVIPE</td>
<td>BACTVIPE</td>
<td>BACTVIPE</td>
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<tr>
<td>Coffee leaf rust*</td>
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</tr>
<tr>
<td>Anthracnose (Twig dieback, Brown blight &amp; Leaf necrosis)*</td>
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</tr>
<tr>
<td>Fusarium Wilt*</td>
<td>SANJEEVNI &amp; PHASAL RAKSHAK</td>
<td>SANJEEVNI &amp; PHASAL RAKSHAK</td>
<td>PHASAL RAKSHAK &amp; MILDOWN</td>
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<tr>
<td>Red Root Disease**</td>
<td>BACTVIPE</td>
<td>BACTVIPE</td>
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</tr>
<tr>
<td>Root-knot Nematode**</td>
<td>NEMATOFREE+</td>
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</tr>
<tr>
<td><strong>Insect Pests Management</strong></td>
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<tr>
<td>Aphid*</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
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<tr>
<td>Coffee berry borer*</td>
<td>KALICHAKRA</td>
<td>NAGESTRA &amp; DAMAN</td>
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<tr>
<td>Termites*</td>
<td>KALICHAKRA</td>
<td>DEVASTRA</td>
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<td>Mealy bug*</td>
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<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
<td>WIPEOUT &amp; VARUNAstra</td>
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Remark:* Apply on early stage of disease appearance, Repeat application after 6-10 days if not control. ** Apply before the appearance of pest or disease as per yearly presence of disease.
The environment, including every cc of soil and all crops, are teeming with billions of microbes. Most of them, upto 99%, are inert or beneficial. Over millions of years, nature has developed a balance and these microbes sustain and support the crop life-cycle, with different microbes and insects providing some beneficial action at different stages of the crops. There are some microbes, however, which cause plant diseases, and some insects which damage the crops. Nature has provided natural counter-measures to these in the form of microbes which attack and destroy these disease causing pathogens or harmful pests. Other microbes decompose organic matters, fix nitrogen from the air, mobilize many major and minor nutrients, improve soil pH and inhibit harmful bacterial growth.

At IPL, we harness the power of nature for the benefit of agriculture, by providing safe chemical-free solutions to help growers meet the global challenge of producing more with less in a sustainable way.
OUR CERTIFICATION

All IPL products are tested in various field trials under different agro-climatic conditions in reputed agricultural universities and continuously re-validated.

All our products have been certified by IMO, OMRI & INDOCERT. as input for organic agriculture.

Bio-pesticides are registered with Central Insecticide Board & Registration committee (CIB & RC) as per IA 1968, and Bio-fertilizer with Fertilizer Control Order (FCO-1985).
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