



KRISHI MITRA[®]

A friendly guide to farming

Special Edition:
In memory of **Dr. M. S. Swaminathan**

EDITION-6 | YEAR-`24

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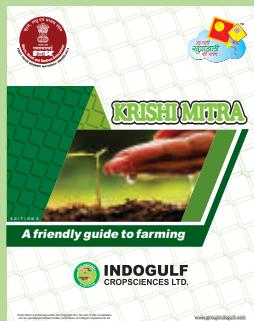
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Pages in the Krishimitra : 111

EDITORS' COMMENTS



Welcome, Dear Indogulfians, to another enlightening edition of our Krishimitra, an agriculture knowledge magazine. In this issue, you will embark on a journey through the vast and diverse fields of agricultural wisdom with new additions where knowledge becomes the fertile ground for growth.

In the pursuit of progress, knowledge is the plow that furrows the path forward. This issue retains the essence of previous edition with spotlights on agronomy and pest management while adding the latest development in the field of soil health, crop nutrition, and pest management. Discover the latest breakthroughs in agricultural sciences and the potential they hold for transforming farming practices in India.

Biostimulants are a rapidly emerging field in agriculture that holds great promise for improving crop productivity and sustainability. These substances are derived from natural sources, such as plants, microorganisms, and seaweed, and they are used to stimulate plant growth, enhance nutrient uptake, and improve tolerance to abiotic stressors. Biostimulants are distinct from fertilizers and pesticides, as they contain substances that are not essential nutrients or direct plant protection agents. In conclusion, biostimulants represent a promising avenue for improving agricultural productivity and sustainability.

As one leaf through the annals of Indian agriculture, the name Mankombu Sambasivan Swaminathan, or M. S. Swaminathan (7 August 1925 – 28 September 2023), stands as an indomitable force that has shaped the course of our agrarian landscape. As we traverse the fertile fields of his contributions, we uncover a legacy woven with innovation, compassion, and an unwavering commitment to the welfare of Indian farmers. As a mark of respect and tribute, this edition of Krishimitra is dedicated to M S Swaminathan, the main architect of Green Revolution in India.

Agriculture is more about food security for everyone across the globe. This can only happen with quality agri-input products. Indogulf through its efforts is aimed at bringing greener technology to the door steps of the farmer. Success story of the organization is guided by TEAM WORK wherein as a group have been able to build a strong image in the different segments of Agri-Inputs, be it Biostimulants, Crop Supplements or Crop Protection. In this endeavor, knowledge of 4 R's plays vital role viz., Right Place, Right Crop, Right Product and Right Dose. Krishimitra has been important tool for dissemination and empowering Indogulfians with latest developments and knowledge.

All The Best, Indogulfians.

Sunnil Kumar

PROUD MOMENTS FOR INDOGULFIANS



CMD Sir & MD Sir with Sarsanghchalak of the RSS
Sh. Mohan Bhagwat



Director Sh. Bhupender Kaushik with Union Cabinet Minister Sh. Raj Nath Singh



Managing Director Sh. Sanjay Aggarwal with Union Cabinet Minister Sh. Nitin Gadkari



MD Sir Sh. Sanjay Aggarwal awarded by Haryana Chief Minister Sh. Manohar Lal Khattar



Director Sh. Bhupender Kaushik with Union Cabinet Minister Sh. Narendra Singh Tomar



Sh. Radha Mohan Singh Former Minister of Agriculture & Farmers Welfare at our Factory on "Kalyan Utsav"



MD Sir Shri Sanjay Aggarwal awarded by Haryana Agriculture Minister Sh. O. P. Dhankar



CMD Sir, MD Sir & Director Sir felicitating Sh. Kaptan Singh Solanki ji, Governor of Haryana

Late Sh. Shri Krishan Dass Aggarwal laid down foundation of the organization in 1965 with determination and commitment to fulfil the requirements of the farmer by providing them the world class product at affordable price.

Late Sh. Shri Krishan Dass Aggarwal

Founder

THE LEGEND



MESSAGE FROM GROUP CHAIRMAN

Indian agriculture is unique, diversified and vast, providing livelihood and income to more than half of our population. It is well-known that today India is one of the forerunners in agriculture among the developing countries. Since independence, Indian agriculture has changed from a 'ship-to-mouth' status to self-sufficiency, to presently a food-exporting nation. This was possible due to science, technology, innovation (STI) and policy-backed agricultural revolutions. In this effort, Indogulf also since its inception has been making efforts to disseminate the knowledge for the betterment of Agriculture through its team of Indogulfians. Present edition of KRISHIMITRA has all the updated information related to Crop Protection and Nutrition. Knowledge leads to transformation and KRISHIMITRA has been playing an important role as a tool for the transformation which shall lead to guiding our farmers towards sustainable agriculture through Indogulf's sustainable crop solutions.

Shri Om Prakash Aggarwal

Group Chairman

INDOGULF CROPSCIENCES LTD.

MESSAGE FROM THE DESK OF MANAGING DIRECTOR

In our continuous endeavor to empower our farmers with latest knowledge, it gives me immense pride & pleasure to present you the 5th edition of KRISHIMITRA. This edition of KRISHIMITRA is one such tool which helps farmers to get all the information which leads to increase in farm productivity.

Agriculture plays a very prominent role in the overall development and growth of the country's economy. India emerged as the second largest exporter of agrochemicals globally in 2022 (WTO data). Indogulf is in the league of Indian agrochemical industry which has established advanced world class manufacturing facilities to cater to the domestic and global demands. In order to address the challenges of educating farmers for Right Agri-inputs at the Right Dosage at the Right Time along with creation of skilled, talented and entrepreneurial human resource, this endeavour in the name of 'KRISHIMITRA' would go a long way.

Given the potential and opportunity ahead in agriculture, knowledge and its sharing would play an important role for sustainable agriculture. I hope and wish 'KRISHIMITRA' to be a beacon for all.

Happy Reading

Sanjay Aggarwal
Managing Director, Indogulf Cropsciences Ltd.



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AWARDS

- First National MSME Award by Hon. Prime Minister Sh. Narendra Modi



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સાટ્રાય તુર્યકાર

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कर्मभारतम् एव

महिलाओं को चरखा



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ZEE BUSINESS Dare to Dream Awards



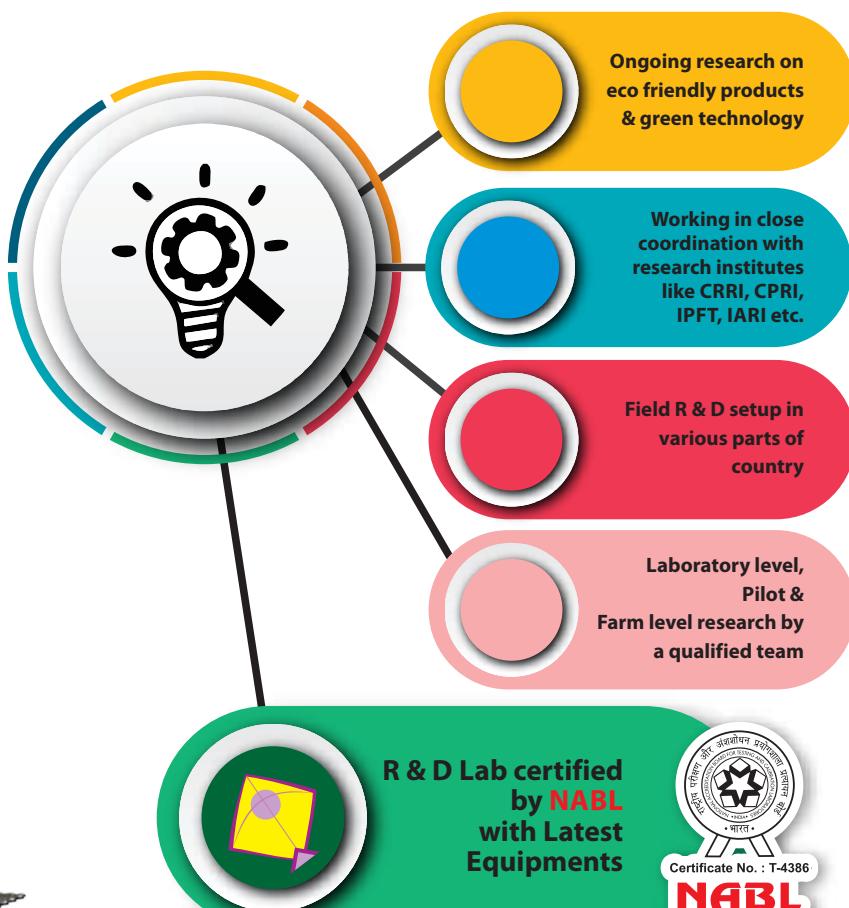
INDOGULF's foray into the Digital space with successful implementation of SAP

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CERTIFICATION



Approved By IMO



"Approved Input for use in organic agriculture according to NPOP standard attested by Ecocert India Pvt. Ltd. (NPOP/NAB/002)"

Approved By ECOCERT



Approved By IARI



Approved By OMRI

MEMBERSHIP



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Our advanced manufacturing plants boast cutting-edge technology and modern infrastructure. Equipped with state-of-the-art equipment, we ensure precision and efficiency at every stage of the manufacturing process. Our facilities are designed to meet international standards, enabling us to deliver products that consistently surpass expectations.



1 Unit-I Samba (J&K), INDIA



2 Unit-II Technical Plant, Haryana, INDIA



3 Unit-III Nathupur Distt. Sonepat, Haryana, INDIA



4 Unit-IV Badvasni, INDIA



5 Unit-V Badvasni, INDIA



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THE GREEN REVOLUTION PIONEER:

M. S. SWAMINATHAN'S

ENDURING LEGACY IN INDIAN AGRICULTURE

In the annals of Indian agriculture, the name Mankombu Sambasivan Swaminathan, or M. S Swaminathan, stands as an indomitable force that has shaped the course of our agrarian landscape. As we traverse the fertile fields of his contributions, we uncover a legacy woven with innovation, compassion, and an unwavering commitment to the welfare of Indian farmers.

FATHER OF THE GREEN REVOLUTION IN INDIA: A VISIONARY TRAILBLAZER

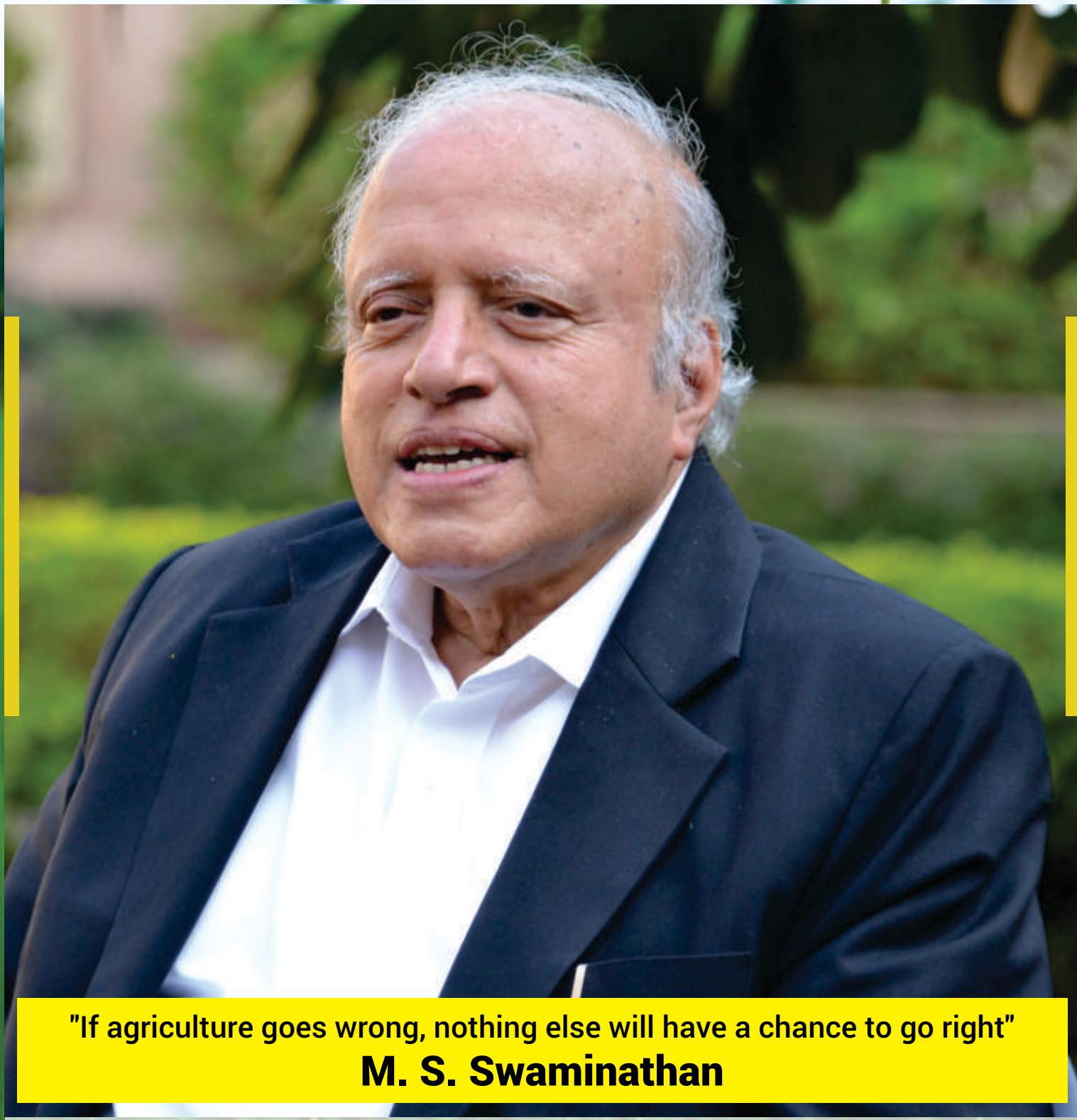
M. S. Swaminathan's journey as a scientist, geneticist, and agricultural visionary commenced in the mid-20th century. Faced with the challenge of feeding a growing population, he championed the introduction of high-yielding crop varieties, a movement that would later be heralded as the Green Revolution. His foresight and dedication to scientific advancements became the bedrock of India's agrarian transformation.



Name	: Mankombu Sambasivan Swaminathan
Born	: 7 August 1925
Died	: 28 September 2023
Institution	: Indian Agricultural Research (IARI; as teacher, researcher and research administrator, 1954–1972) Indian Council of Agricultural Research (ICAR; as Director General, 1972–1980) International Rice Research Institute (IRRI; as Director General, 1982–1988)

CROP DIVERSIFICATION: NURTURING BIODIVERSITY

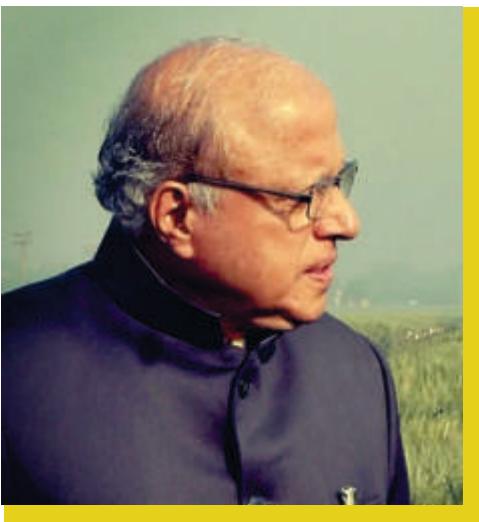
Beyond the introduction of high-yielding varieties, Swaminathan emphasized the importance of crop diversification. Recognizing the vulnerability associated with mono-cropping, he advocated for the cultivation of a diverse range of crops. This not only bolstered food security but also safeguarded against the risks of pest outbreaks and environmental degradation.



"If agriculture goes wrong, nothing else will have a chance to go right"
M. S. Swaminathan

Farmers' Rights and Social Equity: An Advocate for the Marginalized

Swaminathan's contributions extend beyond scientific innovation; he has been a vocal advocate for the rights of farmers, particularly those in marginalized communities. His emphasis on social equity led to the formulation of policies that aimed at uplifting the socio-economic status of farmers, ensuring that the benefits of agricultural progress reached every corner of rural India.



Evergreen Revolution: Sustainable Agriculture for Tomorrow

In the latter part of his career, Swaminathan championed the concept of the "Evergreen Revolution." This paradigm shift emphasized sustainable agriculture, integrating ecological principles with modern technology. His vision extended to agroecological practices that promote harmony between agriculture and the environment, paving the way for a resilient and sustainable future.

Legacy in Agricultural Education and Research

M. S. Swaminathan's impact is not confined to the fields but extends to the realm of education and research. Founder of the M. S. Swaminathan Research Foundation, his commitment to nurturing scientific talent and fostering research continues to influence the next generation of agricultural scientists and policymakers.

Awards and Accolades: A Recognition of Excellence

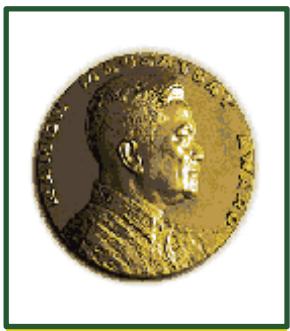
Swaminathan's contributions have earned him numerous awards, including the Padma Vibhushan and the World Food Prize. These accolades not only honor his individual achievements but also symbolize the recognition of Indian agriculture on the global stage.

As we reflect on M. S. Swaminathan's contributions, we find ourselves standing in the shade of trees he planted, both metaphorically and literally. His tireless efforts have not only propelled Indian agriculture into the 21st century but have also sown the seeds of sustainable progress for generations to come.

In celebrating the life and work of M. S. Swaminathan, we acknowledge the profound impact of a visionary who dared to dream of a bountiful, equitable, and sustainable future for Indian agriculture.



Padma Shri (1967)



Ramon Magsaysay Award (1971)



Padma Bhushan (1972)



World Food Prize (1987)



Padma Vibhushan (1989)

Pesticides and Their Uses

Type	Action
Algicides	Control algae in lakes, canals, swimming pools, water tanks, and other sites
Antifouling agents	Kill or repel organisms that attach to underwater surfaces, such as boat bottoms
Antimicrobials	Kill microorganisms (such as bacteria and viruses)
Attractants	Attract pests (for example, to lure an insect or rodent to a trap).
Biopesticides	Biopesticides are certain types of pesticides derived from natural materials as animals, plants, bacteria, and certain minerals
Biocides	Kill microorganisms
Disinfectants and sanitisers	Kill or inactivate disease-producing microorganisms on inanimate objects
Fungicides	Kill fungi (including blights, mildews, molds, and rusts)
Fumigants	Produce gas or vapour intended to destroy pests in buildings or soil
Herbicides	Kill weeds and other plants that grow where they are not wanted
Insecticides	Kill insects and other arthropods
Miticides	Kill mites that feed on plants and animals
Microbial pesticides	Microorganisms that kill, inhibit, or out compete pests, including insects or other microorganisms
Molluscicides	Kill snails and slugs
Nematicides	Kill nematodes (microscopic, worm-like organisms that feed on plant roots)
Ovicides	Kill eggs of insects and mites
Pheromones	Biochemicals used to disrupt the mating behaviour of insects
Repellents	Repel pests, including insects (such as mosquitoes) and birds
Rodenticides	Control mice and other rodents
Chitin Inhibitor	Chitin synthesis inhibitor work by preventing the formation of chitin, a carbohydrate needed to form the insects exoskeleton. With these inhibitors an insect grow normally until it molts. The inhibitors prevent the new exoskeleton from forming properly, causing the insect to die.

Further types of Pesticides

The term pesticide also include these substances:

- Defoliants: Cause leaves or other foliage to drop from a plant, usually to facilitate harvest.
- Desiccants: Promote drying of living tissues, such as unwanted plant tops.
- Insect growth regulators: Disrupt the molting, maturity from pupal stage to adult, or other life processes of insects.
- Plant growth regulators: Substances (excluding fertilizers or other plant nutrients) that alter the expected growth, flowering, or reproduction rate of plants.

Categorization of Pesticides

A. ON THE BASIS OF TARGET SPECIES

I. MICRO-ORGANISM	Fungi Algae Bacteria	Fungicides Algicide Bactericide
II. INSECTS	Mites & Ticks Others	Acaricides or Miticides Insecticide
III. RODENTS	Rats	Rodenticide
IV. NEMATODES	Nematods	Nematicides
V. BIRDS	Birds	Avicides
VI. PLANTS	Herbs	Weedicides or Herbicides

B. ON THE BASIS OF CHEMICAL NATURE

I. INORGANIC

Inorganic pesticides are simple compounds, crystalline, environmentally stable and usually dissolve readily in water e.g. Lime and sulfur.

II. ORGANIC

Insecticides

Organochlorides / phosphates
Carbamates
Synthetic Pyrethroids
Neonictionoides
Pyrazole
Avermectins

Herbicides

Nitrophenols-uracils
Chlorphenaxy Triazines
Dipridyls-Thiocarbamates
Urea Derivative-Other Organics.
Acetanilids
Benzoic acids

Fungicides

Organotin-Organophosphorous
Organomercurials
Dithiocarbamates

C. ON THE BASIS OF SITE OF ACTION

I. Stomach Poison

II. Contact Poison

III. Systemic Poison

IV. Fumigants

V. Herbicides

(A) Selective
(B) Non-selective

D. ON THE BASIS OF PESTICIDES FORMULATIONS

A. For spraying after mixing with water/oil.

- Emulsifiable concentrate (EC).
- Wettable Powders (WDP or WP).
- Ultra low volume (ULV).
- Water soluble liquid concentrate (WSC or SL.).
- Suspension concentrate (SC).
- Capsule Suspension (CS).
- Water Soluble Powder (SP).
- Mixture CS & SC (ZC).

B. For Dry Applications directly from the Containers

- Dusts (D or DP).
- Granules (G or GR).
- Encapsulated granules (CG).
- Water dispersible granule (WDG).
- Wettable granule (WG).
- Soluble granule (SG).

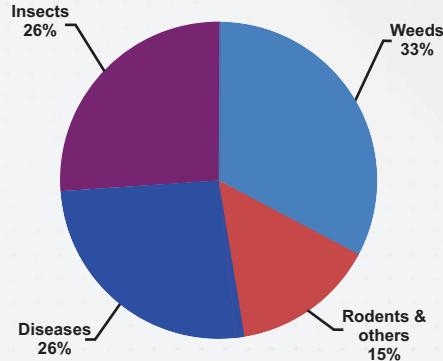
C. For Applications as a gas or vapour

- Fumigants
- Smoke generators or tablets which vapourise.
- Aerosols and pressurised spray.

D. Other Formulations

- Seed Protectants (dry or liquid) (SD).
- Baits for rodents, flies, slugs, cockroaches etc.
- Flowable concentrate for seed treatment (FS).

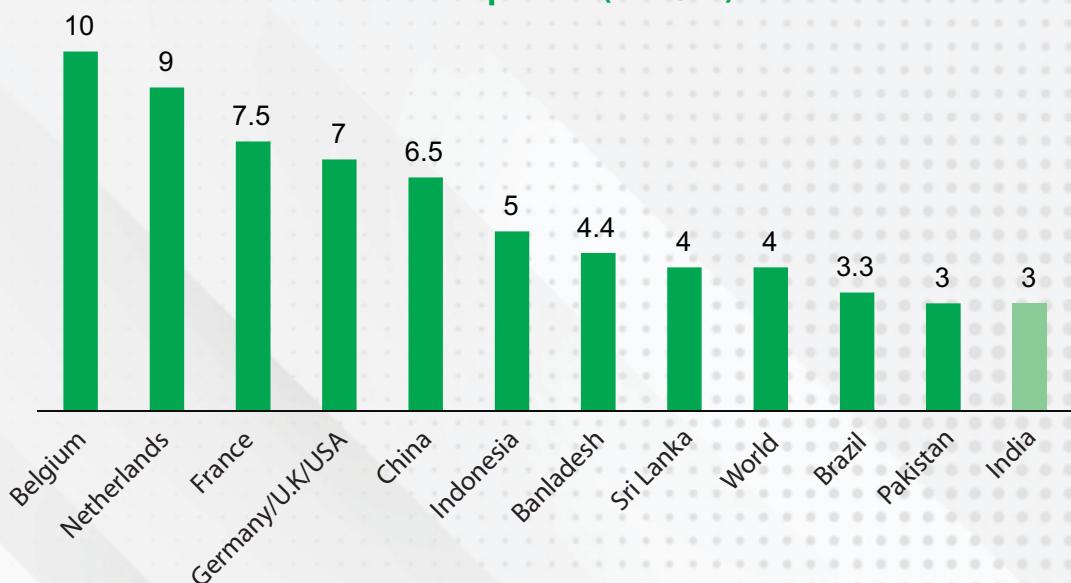
LOSSES CAUSED BY DIFFERENT PESTS



Crop losses : US \$ 19 Billion

Department of Chemicals and Petrochemicals, Govt. of India (37th Report)

Yield comparison (Tons/ha)



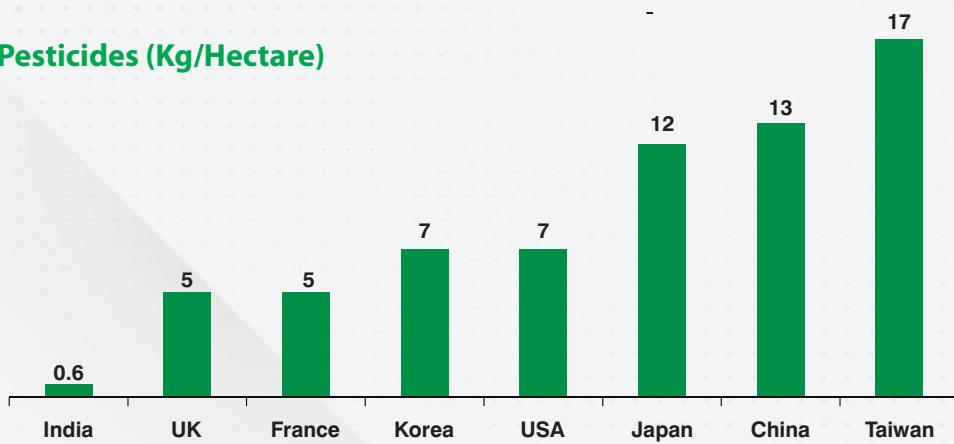
Source : Industry reports, Analysis by FICCI & TATA Strategic Management Group

Crop wise pests

Crop	1940		At present	
	Total pests	Serious Pests	Total pests	Serious Pests
Rice	35	10	240	17
Wheat	20	2	100	19
Sugarcane	28	2	240	43
Groundnut	10	4	100	12
Mustard	10	4	38	12
Pulses	35	6	250	34

Source : Industry reports, Analysis by FICCI & TATA Strategic Management Group

Consumption of Pesticides (Kg/Hectare)



Source : Industry reports, Analysis by FICCI & TATA Strategic Management Group-2017

Botanical Classification of Crops

Crop Name	Botanical Name	Chromo- some no.	Center of Origin
Cereals			
Rice	<i>Oryza sativa</i> (Gramineae)	24	Indo Burma
Wheat	<i>Triticum aestivum</i> (Gramineae)	42	South west Asia
Maize	<i>Zea mays</i> (Gramineae)	20	Maxico
Jowar	<i>Sorghum bicolor</i> (Gramineae)	20	Ethiopia and Sudan
Bajra	<i>Pennisetum typhoides</i> (Gramineae)	14	Africa
Barley	<i>Hordeum vulgar</i> (Gramineae)	14	Ethiopia
Madua/Finger millet	<i>Eleucine coracana</i> (Good for diabetes patient) (Gramineae)	36	East Africa
Proso millet	<i>Panicum miliaceum</i> (Gramineae)	18	India
Swan/Ballon Plant	<i>Echinochloa frumentacea</i> (Gramineae)	16	India
Kodo	<i>Paspalum scrobiculatum</i> (Gramineae)	20-60	India
Kakun	<i>Setaria italic</i> (Gramineae)	18	India
Pulses			
Gram/chickpea	<i>Cicer arietinum</i> (Leguminosae)	16	South West Asia
Lentil	<i>Lens esculenta</i> (Leguminosae)	14	Middle East
Pea	<i>Pisum spp.</i> (Leguminosae)	14	Mediterranean center

GENERAL PESTICIDE INFORMATION

Cowpea / Lobia	<i>Vigna sinensis.</i> (Leguminosae)	22	Central Africa
Arhar / Redgram/	<i>Cajanus cajan.</i> (Leguminosae)	22	Africa
Pigeonpea			
Green Gram / Moong	<i>Vigna radiata</i> (Leguminosae)	22	Central Asia
Soyabean	<i>Glycine max.</i> (Leguminosae)	22	Central Asia
Black gram / Urd	<i>Vigna mungo</i> (Leguminosae)	40	Central Asia
Oilseed			
Groundnut	<i>Arachis hypogea</i> (Fabaceae)	20	South American Centre
Sesamum til	<i>Sesamum indicum</i> (Pedaliaceae)	16	South west Asia
Castor	<i>Ricinus communis</i> (Euphorbiaceae)	20	Ethiopia
Rapeseed / Mustard	<i>Brassica spp.</i> (Cruciferae)	18-20	Afghanistan, Pakistan, India
Linseed / Flax	<i>Linum usitatissimum</i> (Linaceae)	16	Mediterranean centre
Safflower	<i>Helianthus annus</i> (Compositae)	24	Egypt
Sunflower	<i>Carthamus tinctorius</i> (Compositae)	34	Maxico
Sugar Crops			
Sugarcane	<i>Saccharum officinarum</i> (Gramineae)	80-120	North Eastern India
Sugar beet	<i>Beta vulgaris</i> (Chenopodiaceae)	18	Italy
Fibre Crops			
Cotton	<i>Gossypium spp.</i> (Malvaceae)	52	India
Jute	<i>Corchorus spp.</i> (Tiliaceae)	14	Bangladesh
Sunnhemp / Hemp	<i>Crotalaria juncea</i> (Leguminosae)	42	India
Indian Mesta	<i>Hibiscus spp</i> <i>Sabdariffa, Cannabinus</i>		Iberia, Europe
Forage Crops			
Oat	<i>Avena sativa</i> (Gramineae)	42	West Africa
Elephant grass	<i>Pennisetum purpureum</i> (Gramineae)	27-56	Uganda
Berseem	<i>Trifolium alexandrinum</i> (Leguminosae)	16	Syria/Egypt
Lucerne / Alfalfa	<i>Medicago sativa</i> (Leguminosae)	16	South Central Asia
Guar	<i>Cyamopsis tetragonoloba</i> (Leguminosae)	14	Africa / India
Root and Tuber Crops			
Potato	<i>Solanum tuberosum</i> (Solanaceae)	48	Peru
Sweet Potato	<i>Ipomea batatas</i> (Convolvulaceae)	90	Central American Central
Cassava / Tapioca	<i>Manihot esculenta</i> (Euphorbiaceae)	36	Brazil
Yams	<i>Dioscorea spp.</i> (Dioscoreaceae)	20-90	Africa / Asia
Cocoyam	<i>Taro : Colocasia esculenta</i>	22	Cyprus
	<i>Tannia : xanthosoma sagittifolia</i> (Araceae)		Cyprus
Zimikand	<i>Amorphophallus campanulatus</i> (Araceae)	24-60	Africa / Asia
Chinese Potato (Koorka)	<i>Planthracus rofundifolius</i> (Convolvulaceae)	48	Africa
Arrow Root / Koova Ararut	<i>Maranta arundinacea</i> (Zingiberaceae)	48	North West Brazil

Kharif Crops

Paddy, Maize, Jawar, Bajra, Till, Guar, Groundnut, Cotton, Soyabean, Moong, Urd, Sunnhemp, Sunflower, Tomato, Cucurbits,

Rabi Crops

Wheat, Barley, Gram, Mustard, Tobacco, Sugarcane, Berseem, Linseed, Cowpea, Potato, Oat.

Crops	Protein Content %	Oil Content %
Rice	6-7%	
Wheat	11-12%	
Maize	10%	
Sorghum	10-12%	
Millet	11-12%	
Barley	11.50%	
Gram	21.10%	
Pea	22.50%	
Moong	25%	
Lentil	25%	
Pigeon Pea	21-25%	
Urd	24%	
Cowpea	23.40%	
Soybean	42%	20%
Groundnut	26%	46-51%
Sesame	18-20%	50%
Linseed	36%	50-55%
Safflower (Oil cakes)	30%	40-50%
Brassica spp.	35-40%	40-45%

Taxonomic Classification of Crops

- (1) **Poaceae (Graminae)**-Cereals, Sugarcane, Napier grass, Para grass, Bamboo , Vetiver .
- (2) **Papilionaceae (Leguminosae)** -Pulses, Legumes, Groundnut, Sunnhemp.
- (3) **Cruciferae**- Mustard, Radish, Cabbage, Cauliflower, Knolkhola.
- (4) **Cucurbitaceae**- Bottle gourd, Bitter gourd, Ridge gourd, Cucumber, Pumpkin, Squashes.
- (5) **Malvaceae** –Cotton, Bhindi, Rose.
- (6) **Solanaceae**- Brinjal, Potato, Tomato, Tobacco, Chillies, Petunia.
- (7) **Tiliaceae**- Jute, Phalsa.
- (8) **Asteraceae (Compositae)** - Sunflower, Safflower, Niger.
- (9) **Chenopodiaceae** - Spinach, beet, Sugarbeet.
- (10) **Pedaliaceae** -Sesame (Sesamum)
- (11) **Euphorbiaceae** - Castor, Tapioca, Cassava, Jatropha.
- (12) **Convolvulaceae** - Sweet Potato.
- (13) **Umbelliferae** - Coriander, Cumin, Carrot.
- (14) **Aliaceae** - Onion, Garlic.
- (15) **Zingiberaceae** - Ginger, Turmeric.

Classification of Crop Plants

Importance of classifying the Crop Plants:

1. To get acquainted with crops.
2. To understand the requirement of soil & water for different crops.
3. To know adaptability of crops.
4. To know the growing habit of crops.
5. To understand climatic requirement of different crops.
6. To know the economic produce of the crop plant & its use.
7. To know the growing season of the crop
8. Overall to know the actual condition required to the cultivation of plant.



Classification Based on Climate:

1. **Tropical:** Crops grow well in warm & hot climate. e.g. Rice, sugarcane, Jowar etc
2. **Temperate:** Crops grow well in cool climate. e.g. Wheat, Oats, Gram, Potato etc.

Classification Based on Growing Season:

1. Kharif/Rainy/Monsoon crops: The crops grown in monsoon months from June to Oct-Nov, Require warm, wet weather at major period of crop growth, also required short day length for flowering. e.g. Cotton, Rice, Jowar, Bajra.
2. Rabi/winter/cold seasons crops: require winter season to grow well from Oct to March month. Crops grow well in cold and dry weather. Require longer day length for flowering. e.g. Wheat, gram, sunflower etc.
3. Summer/Zaid crops: crops grown in summer month from March to June. Require warm day weather for major growth period and longer length for flowering. e.g. Groundnuts, Watermelon, Pumpkins, Gourds.

Use/Agronomic Classification:

1. **Grain Crops:** May be cereals as millets. Cereals are the cultivated grasses grown for their edible starchy grains. The larger grain used as staple food is cereals. e.g. rice, Jowar, wheat, maize, barley, and millets are the small grained cereals which are of minor importance as food. e.g. Bajra.
2. **Pulse/Legume Crops:** Seeds of leguminous crops plant used as food. On splitting they produced dal which is rich in protein. e.g. Green Gram, Black Gram, Soybean, Pea, Cowpea etc.
3. **Oil Seeds Crops:** Crop seeds are rich in fatty acids, are used to extract vegetable oil to meet various requirements. e.g. Groundnut, Mustard, Sunflower, Sesamum, Linseed etc.
4. **Forage Crop:** It refers to vegetative matter fresh as preserved utilized as food for animals. Crop cultivated & used for hay, silage. Ex- Sorghum, Elephant Grass, Guinea Grass, Berseem & Other Pulse Bajra etc.
5. **Fiber Crops:** Crown for fiber yield. Fiber may be obtained from seed. e.g. Cotton, Jute, Mesta, Sunn hemp, Flax.
6. **Roots Crops:** Roots are the economic produce in root crop. e.g. Sweet Potato, Sugar Beet, Carrot, Turnip etc.
7. **Tuber Crop:** Crop whose edible portion is not a root but a short thickened underground stem. e.g. Potato, Yam, Cassava, Sweet potato.
8. **Sugar Crops:** The two important crops are sugarcane and sugar beet cultivated for production for sugar.
9. **Starch Crops:** Grown for the production of starch. e.g. Tapioca, Potato, Sweet Potato.
10. **Drug Crop:** Used for preparation for medicines. e.g. Tobacco, Mint, Pyrethrum.
11. **Spices & Condiments/Spices Crops:** Crop plants as their products are used to flavor taste and sometime color the fresh preserved food. e.g. Ginger, Garlic, Chili, Cumin Onion, Coriander, Cardamom, Pepper, Turmeric etc.
12. **Vegetables Crops:** May be leafy as fruity vegetables. e.g. Palak, Mentha, Brinjal, Tomato.
13. **Green Manure Crop:** Grown and incorporated into soil to increase fertility of soil. e.g. Sunn hemp.
14. **Medicinal & Aromatic Crops:** Medicinal plants includes cinchona, isabgol, opium poppy, senna, belladonna, rauwolfia, and aromatic plants such as lemon Grass, Citronella Grass, Palmorsa, Japanese Mint, Peppermint, Rose Geranicem, Jasmine, Henna etc.

General Classification of Crops

FIELD CROPS

1. Wheat
2. Paddy
3. Maize
4. Barley
5. Sorghum
6. Black gram
7. Green gram/Moth bean
8. Pigeon pea/Red gram
9. Potato
10. Gram
11. Cowpea
12. Sugarcane
13. Lentil

VEGETABLE CROPS

1. Cabbage
2. Cauliflower
3. Knol Khol
4. Onion
5. Garlic
6. Brinjal
7. Tomato
8. Peas
9. Beans
10. Musk melon
11. Water melon
12. Bottle gourd
13. Bitter gourd
14. Round gourd
15. Pointed gourd
16. Okra / Bhindi
17. Ridge gourd
18. Spinach
19. Carrot
20. Radish
21. Chilly

22. Turnip

23. Jimikand
24. Yams

HORTICULTURE CROPS

1. Banana
2. Grape
3. Lemon
4. Orange
5. Sweet Orange
6. Guava
7. Papaya
8. Pineapple
9. Pomegranates
10. Cashew
11. Pear
12. Amla
13. Apple
14. Persimmon
15. Plum
17. Jackfruit
18. Litchi
19. Phalsa
20. Custard apple
21. Fig
22. Peach
23. Mango

FIBRE CROPS

1. Jute
2. Sisal
5. Flax
7. Cotton
8. Tobacco

OIL SEED CROPS

1. Groundnut
2. Castor
3. Sunflower

4. Linseed

5. Rape seed / Mustard
- (Raya, Laha, Sarson, Toria, Taramera)

6. Black Sesame

7. Soybean

PLANTATION CROPS

1. Tea
2. Rubber
3. Coffee
4. Coconut

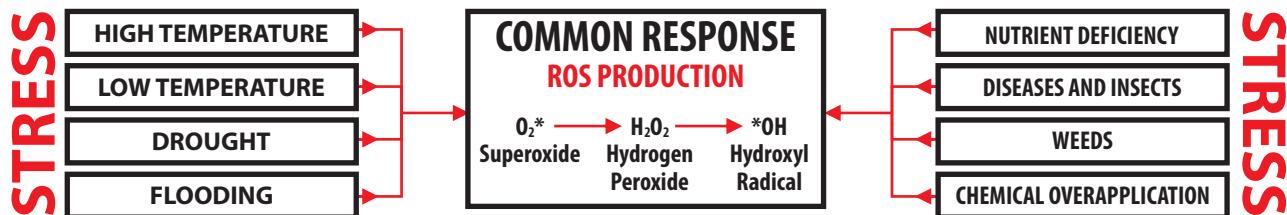
AROMATIC / MEDICINAL PLANTS

1. Palmarosa oil grass
2. Lemon grass
3. Citronella grass
4. Japanese mint
5. Peppermints
6. Spearmint
7. Lemon mint
8. Rose germanium
9. Patchouli
10. Jasmine
11. Davana
12. Henna / Mehndi
13. Linaloe
14. Lemon gum
15. Isabgol
16. Opium poppy
17. Senna
18. Belladonna
19. Rauwolfia
20. Ipecac
21. Foxglove
22. Dill or Sowa
23. Liquorice / Mulhati



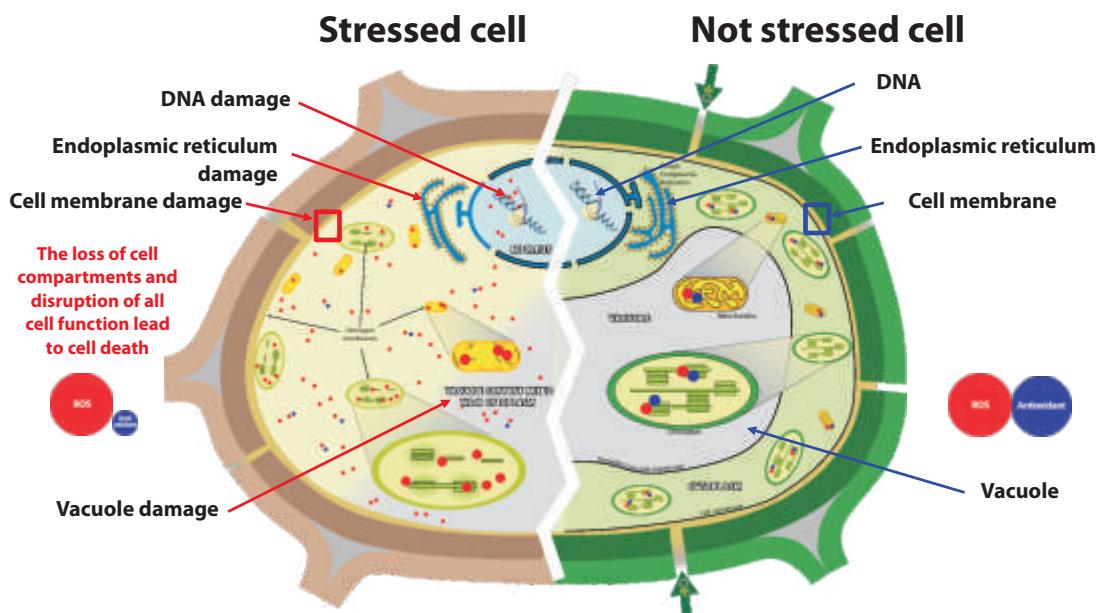
PLANT STRESS

Any unfavorable condition or substance that affects or blocks a plant's metabolism, growth or development (Kranner et al., 2010).



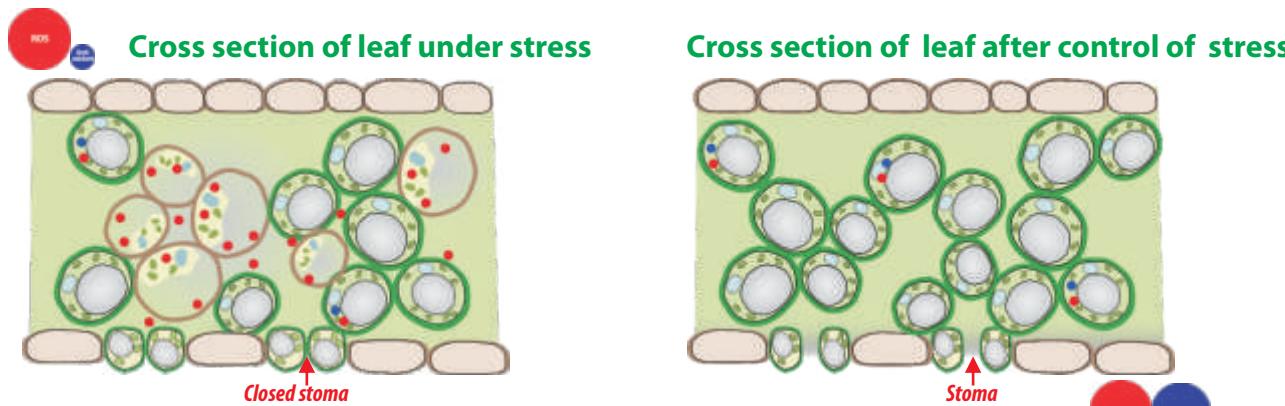
Reactive Oxygen Species (ROS) are chemically reactive molecules containing oxygen. ROS form as a natural byproduct of the normal metabolism and have important roles in intracellular signaling cascades. Under stress conditions, ROS levels can increase dramatically. This may result in significant damage to cell structures.

At Cellular Level



At The Plant Level

Tissue Damage. Comparison of Control and Treated leaves



Cells damaged by excessive production of ROS lose their structure and functions and can not support functions of the whole leaf leading to disruption of the whole plant physiology. If this disruption occurs during critical stages of plant growth and development like flowering or fruit set it may lead to flower or fruit abortions resulting in severe yield reduction.

Sea Weed Extracts help to protect plants from overproduction of ROS keeping cells healthy and supporting functions of the whole leaf and the physiology of the whole plant.

Storage Grain Pests

In India, post-harvest losses caused by unscientific storage, insects, rodents, microorganisms etc., account for about 10 percent of total food grains. The major economic loss caused by grain infesting insects is not always the actual material they consume, but also the amount contaminated by them and their excreta which make food unfit for human consumption. About 500 species of insects have been associated with stored grain products. Nearly 100 species of insect pests of stored products cause economic losses.

Storage insect pests are categorized into two types viz.

- Primary storage pests: Internal and External feeders
- Secondary storage pests (Insects that damage sound grains are primary storage pests)

Common name	Pest	Family	Order
Internal Feeders			
Rice weevil	<i>Sitophilus oryzae</i> , <i>S. zeamais</i> , <i>S. granarius</i>	Curculionidae	Coleoptera
Lesser grain borer	<i>Rhyzopertha dominica</i>	Bostrichidae	Coleoptera
Angoumois grain moth	<i>Sitotroga cerealella</i>	Gelechiidae	Lepidoptera
Pulse beetle	<i>Callosobruchus chinensis</i> , <i>C. maculatus</i>	Bruchidae	Coleoptera
Cigarette beetle	<i>Lasioderma serricorne</i>	Anobiidae	Coleoptera
Drug store beetle	<i>Stegobium paniceum</i>	Anobiidae	Coleoptera
Tamarind Beetle	<i>Pachymeres gonagra</i>	Bruchidae	Coleoptera
Sweet Potato weevil	<i>Cylas formicarius</i>	Apionidae	Coleoptera
Potato tuber moth	<i>Phthorimoea operculella</i>	Gelechiidae	Lepidoptera
Arecanut beetle	<i>Araecerus fasciculatus</i>	Anthribidae	Coleoptera
External Feeders			
Red flour beetle	<i>Tribolium castaneum</i> , <i>Tribolium confusum</i>	Tenebrionidae	Coleoptera
Indian meal moth	<i>Plodia interpunctella</i>	Phycitidae	Lepidoptera
Fig moth or almond moth	<i>Ephestia cautella</i>	Phycitidae	Lepidoptera
Rice moth	<i>Corcyra cephalonica</i>	Galleriidae	Lepidoptera
Khapra beetle	<i>Trogoderma granarium</i>	Dermestidae	Coleoptera

Secondary storage pest: Insects that damage broken or already damaged grains secondary storage pests.

Common name	Pest	Family	Order
Saw toothed grain beetle	<i>Oryzaephilus surinamensis</i>	Silvanidae:	Coleoptera
Long headed flour beetle	<i>Latheticus oryzae</i>	Tenebrionidae	Coleoptera
Flat grain beetle	<i>Cryptolestes minutus</i>	Cucujidae	Coleoptera
Grain lice	<i>Liposcelis divinatorius</i>	Liposcelidae	Psocoptera
Grain mite	<i>Acarus siro</i>	Acaridae	Acari

Management of Storage Pests

The effective management of storage pests may be ensured by drying the grains properly before storage, storing new grains in the clean godowns or receptacles and plugging all cracks, crevices and holes in the godowns thoroughly. If infestation of grain has already taken place, then application of chemicals becomes necessary.

1. Surface Treatment:

Disinfect old gunny bags by dipping them in 0.0125 per cent Fenvalerate 20EC or Stark 25EC (Cypermethrin 25EC) for 10 minutes and drying them in shade before filling with grains or use new gunny bags. Disinfect empty godowns or receptacles by spraying 0.05 per cent Jaithion emulsion on the floor, walls and ceiling.

STORAGE PESTS IN CEREAL CROPS



Rice weevil adult with damaged seed



Rice weevil



Adult lesser grain borer



Damaged wheat grain by lesser grain borer



Red floor beetle adult



Larva of Red Floor



Red floor beetle infested rice grains



Angoumois grain moth



Wheat grain damaged by Angoumois grain moth



Grain mite



Damaged wheat grain by grain mite



Grain lice



Damaged wheat grain by grain lice



Saw toothed grain beetle



Khapra Beetle Adult



Larva Pupa and Adult



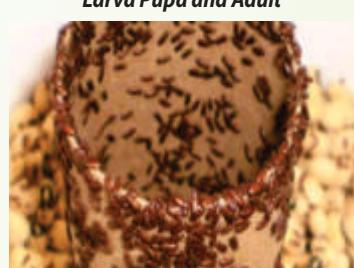
Tamarind beetle



Pulse beetle damage seed



Pulse beetle adult



Damaged and infested pulses grains by Drug beetle



Potato tuber damaged by Tuber moth



Potato Tuber moth adult



Drug Store beetle



Cigarette Beetle Adult

2. Seed Treatment:

Mixing of Jaithion (Malathion) 5 percent at the rate of 250 g per quintal of seed is recommended. The grains may also be treated with/25 ml of Jaithion (Malathion) 50 EC or 2 ml of Fenvalerate 20EC or 1.5 ml of Stark 25 EC (Cypermethrin 25EC) or 14 ml of Dr. Den (Deltamethrin 2.8EC) per quintal of seed by diluting in 500 ml of water. Against pulse beetle (dhora), cover the pulses stored in bulk with 7 cm layer of sand or sawdust or dung ash.

3. Fumigation:

Metallic drums or wooden boxes can be used for fumigating small quantities of grain. In India, ethylene dichloride and carbon tetrachloride mixture has been recommended for fumigation of food grains in storage at farm level, and hydrogen phosphide in the form of aluminium phosphide or methyl bromide for protection in warehouses, godowns and silos. Mixture of ethylene dichloride and carbon tetrachloride at the rate of 1 litre for 20 quintals of grain or 35 litres per 100 m³ of space with exposure period of 4 days is recommended. Methyl bromide is used at the rate of 3.5 kg per 100 m³ of space with 10-12 hours exposure. The fumigant, hydrogen phosphide (aluminium phosphide), is available in tablet form and can be used at the rate of one tablet (3 g) per metric tonne or 25 tablets per 100 m³ of space with an exposure period of 7 days.

Use of Improved Storage Receptacles

The grains can be best protected by using improved insect-proof receptacles of various types.

(a) Indoor Bins

Domestic metal bins, Gharelu theka, Pucca kothi, Welded wire-mesh bin, Reinforced cement ring bins, Paddy straw-mud structure.

(b) Outdoor Bins

Flat and hopper bottom-metal bins, Composite bins, Partly underground and above ground structures, Seed storage bins, Ferro-cement bins, Pusa bin, Improved godowns, Bulk storage installations and Vacuum process storage.

Integrated Management of Stored Produce Pests

The control methods of stored produce pests can be categorized into preventive and curative measures.

Preventive Measures

- Brush the cracks, crevices and corners to remove all debris in the godown.
- Clean and maintain the threshing floor/yard free from insect infection and away from the vicinity of villages.
- Clean the machines like harvester and thresher before their use.
- Make the trucks, trolleys or bullock carts free from infestation.
- Clean the godowns/ storage structures before storing the newly harvested crop to eliminate various bio stages of pest hiding.
- Provide a metal sheet upto a height of 25 cm at the bottom of the wood in doors to arrest the entry of rats.
- Fix up wire meshes to windows, ventilators, gutters, drains etc., to prevent entry of rats, birds and squirrels.
- Remove and destroy dirt, rubbish, sweepings and webbings etc from the stores.
- Close all the rat burrows found in godown with a mixture of broken glass pieces and mud plastered with mud/ cement.
- Plaster the cracks, crevices, holes found on walls, and floors with mud or cement and white wash the stores before storing of grains.
- Provide dunnage leaving gangway or alleyway of 0.75 to 1 m all around to maintain good storage condition.
- Store the food grains in rat and moisture proof storage structures.
- Disinfest the storage structures receptacles by spraying Jaithion 50 EC @3 lit 100 m before their use. Curative measures

Curative Measures

i) Ecological methods

- Manipulate the ecological factors like temperature, moisture content and oxygen through design and construction of storage structures/ godown and storage to create ecological conditions unfavourable for attack by insects.
- Temperature above 420°C and below 150°C retards reproduction and development of insect while prolonged temperature above 450°C and below 100°C may kill the insects.
- Dry the produce to have moisture content below 10% to prevent the buildup of pests.
- Kill the pests bio stages harbored in the storage bags, bins etc., by drying in the sun light.
- Store the grains at around 10 % moisture content to escape from the insects attack.
- Manipulate and reduce oxygen level by 1% to increase the CO₂ level automatically, which will be lethal to all the stages of insects.

ii) Physical methods

- Provide a super heating system by infrared heaters in the floor mills and food processing plants to obtain effective control of pests since mostly the stored produce insects die at 55 –60 °C in 10 – 20 minutes.
- Modify the storage atmosphere to generate low oxygen (2.4% and to develop high carbon di oxide (9.0 – 9.5) by adding CO₂ to control the insects.

iii) Cultural methods

- Split and store pulses to escape from the attack by pulse beetle since it prefers to attack whole pulses and not split ones.
- Store the food grains in air tight sealed structures to prevent the infestation by insects.

iv) Mechanical methods

- Sieve and remove all broken grains to eliminate the condition which favour storage pests.
- Stitch all torn out bags before filling the grains.

v) Chemical methods

- Treat the walls, dunnage materials and ceilings of empty godown with Jaithion (malathion 50 EC) 10 ml/L (or) Ruscron (DDVP 76 WSC) 7 ml/L at 3 L spray solution/10 sq.m.
- Treat the alleyways and gangways with Jaithion (malathion 50 EC) 10 ml/L or Ruscron (DDVP 76 WSC) 7 ml/ L (1 L of spray fluid/270 m³).
- Spray Jaithion 50 EC 10 ml/L with @ 3 L of spray fluid / 100 m² over the bags.
- Do not spray the insecticides directly on food grains.
- Use knock down chemicals like lindane smoke generator or fumigant strips pyrethrum spray to kill the flying insects and insects on surfaces, cracks and crevices.
- Use seed protect ants like pyrethrum dust, carbaryl dust to mix with grains meant for seed purposes only.
- Decide the need for shed fumigation based on the intensity of infestation.
- Check the black polythene sheets or rubberized aluminium covers for holes and get them ready for fumigation.
- Use EDB (Ethylene Di Bromide) ampoules (available in different sizes 3 ml, 6 ml, 10 ml, 15 ml and 30 ml) at 3 ml/quintal for wheat and pulses and 5 ml/quintal for rice and paddy (Do not recommend EDB for fumigation of flour oil seeds and moist grains)
- Use EDCT (available in tin containers of 500 ml, 1 liter and 5 litres) at 30 – 40 litres/ 100 cubic meter in large scale storage and 55 ml/quintal in small scale storage.
- Seed purpose: Mix 1 kg of activated kaolin (or) lindane 1.3 D (or) malathion 5 D for every 100 kg of seed and store/pack in gunny or polythene lined bags.
- Grain purpose: Mix 1 kg activated kaolin for every 100 kg of grain and store. To protect the pulse grains, mix activated kaolin at the above dosage or any one of the edible oils at 1 kg for every 100 kg of grain or mix 1 kg of neem seed kernel for every 100 kg of cereal / pulse and store.
- Do not mix synthetic insecticides with grains meant for consumption.

Fumigation

Use fumigants like Ethylene Di Bromide (EDB), Ethylene Dichloride Carbon Tetra Chloride (EDCT), aluminium phosphide (ALP) to control stored produce pests effectively. Apply aluminium phosphide (available in 0.6 g and 3 gram tablets) @ 3 tablets (3 gram each) per tonne of food grains lot with help of an applicator. Choose the fumigant and work out the requirement based on the following guidelines.

- 3 tablets of aluminum phosphide 3 g each per tonne of grain.
- 21 tablets of aluminium phosphide 3 g each for 28 cubic meters
- Period of fumigation is 5 days

Mix clay or red earth with water and make it into a paste form and keep it ready for plastering all round the fumigation cover or keep ready sand snakes. Place the required number of aluminium phosphide tablets in between the bags in different layer. Cover the bags immediately with fumigation cover. Plaster the edges of cover all round with wet red earth or clay plaster or weigh down with sand snakes to make leaf proof. Keep the bags for a period of 5-7 days under fumigation based on fumigant chosen. Remove the mud plaster after specified fumigation periods and lift cover in the corner to allow the residual gas to escape. Lift the cover after few hours to allow aeration.

BIOSTIMULANTS IN AGRICULTURE

Biostimulants are a new type of agricultural additive product that improve plant growth and crop yields. They stimulate the internal and natural metabolism of plants and protect them from the impact of stress (abiotic / biotic). Biostimulants reduce the need for plant inputs, like fertilizers and pesticides, while maintaining an ideal quality and quantity of crop output. They are often regarded as a renewable source of plant nutrients, promote crop production and soil health and have become a vital constituent in integral crop and soil management. Biostimulants are safe, healthy and nutritious for the consumer.

"Biostimulant" means a substance or microorganism or a combination of both whose primary function when applied to plants, seeds or rhizosphere is to stimulate physiological processes in plants and to enhance its nutrient uptake, growth, yield, nutrition efficiency, crop quality and tolerance to stress, regardless of its nutrient content, but does not include pesticides or plant growth regulators which are regulated under the Insecticide Act, 1968.

Source-Gazette of India, 2021

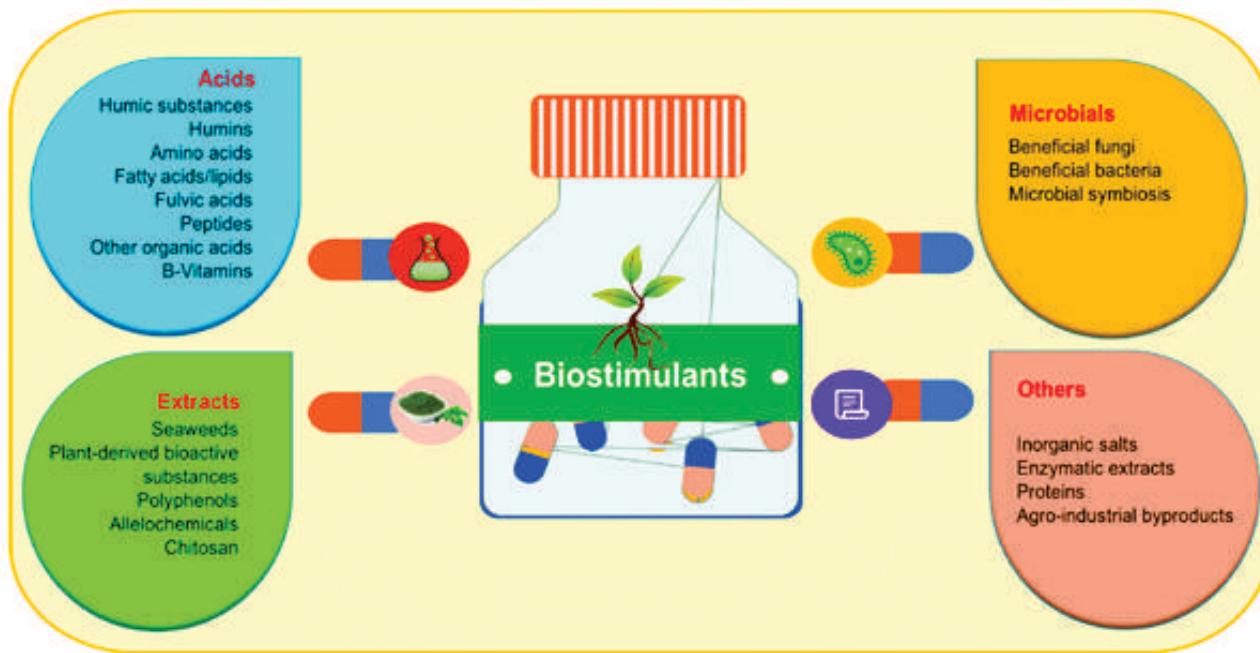
"A 'plant biostimulant' is a product that stimulates the nutritional processes of plants independently of the nutrients it contains, with the sole aim of improving one or more of the following characteristics of plants or their rhizosphere:

1. the efficiency of nutrient use; 2. tolerance to abiotic stress; 3. qualitative characteristics; 4. The availability of nutrients confined in the soil or rhizosphere"

Biostimulants vs Plant Nutrition: Biostimulants and Plant Nutrition are two different concepts related to plant growth and development. Plant Nutrition involves providing essential nutrients to plants for optimal growth. Biostimulants are substances and microorganisms that can enhance plant growth and productivity through various mechanisms, but do not provide primary nutrients or trace elements.

Biostimulants vs Plant Growth Regulator: Biostimulants and Plant Growth Regulators both have a role in enhancing plant growth and development. But they work through different mechanisms and provide different types of benefits to plants. Plant growth regulators typically have a specific physiological effect on the plant. While Biostimulants promote plant growth through indirect means by improving the overall health and nutrient availability of the plant and its surrounding soil.

Categories of Biostimulants:



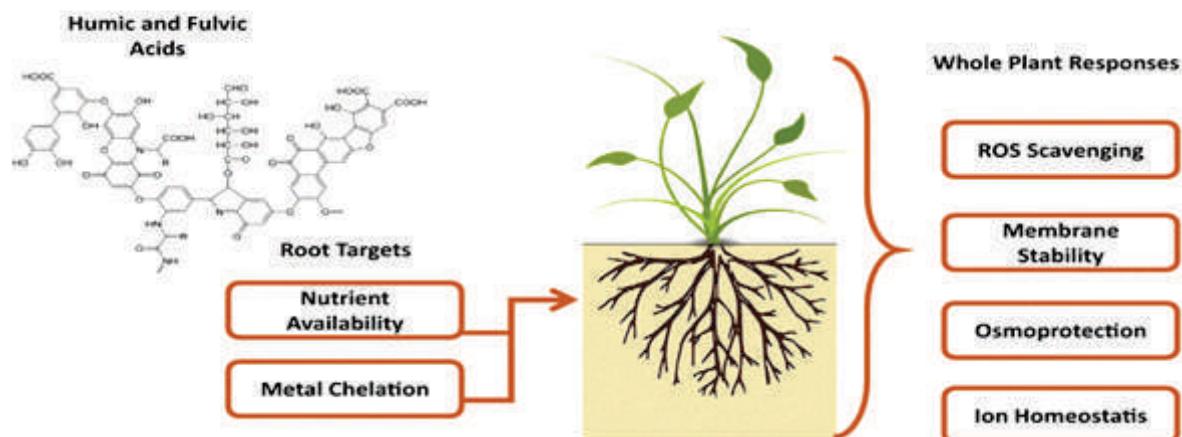
Classification of Biostimulants:

- Humic Substances
- Seaweed Extract
- Chitosan
- Microbial Inoculents
- Protein Hydrolysates
- Vitamins, Antioxidants, Anti transpirants

Humic Substances:

Humic substances (HS) are the innate components of the soil organic matter which is not only the consequent of the degradation of plant, animal and residue of microorganism, but the metabolic products of soil microorganisms utilizing such degraded components. Humic substances can be divided into two categories: humic acids (HA), soluble at alkaline pH and insoluble at acidic pH, and fulvic acids (FA), which are soluble both at alkaline and acidic pH.

KEY MECHANISMS TARGETED BY HUMIC AND FULVIC ACID BASED BIOSTIMULANTS



Following are the effect of Humic Substances on Plant Physiology and Soil:

1. Increases the chlorophyll content
2. Enhanced nutrient uptake
3. Improved soil structure
4. Increased microbial activity
5. Stress tolerance
6. Root development

Seaweed Extracts:

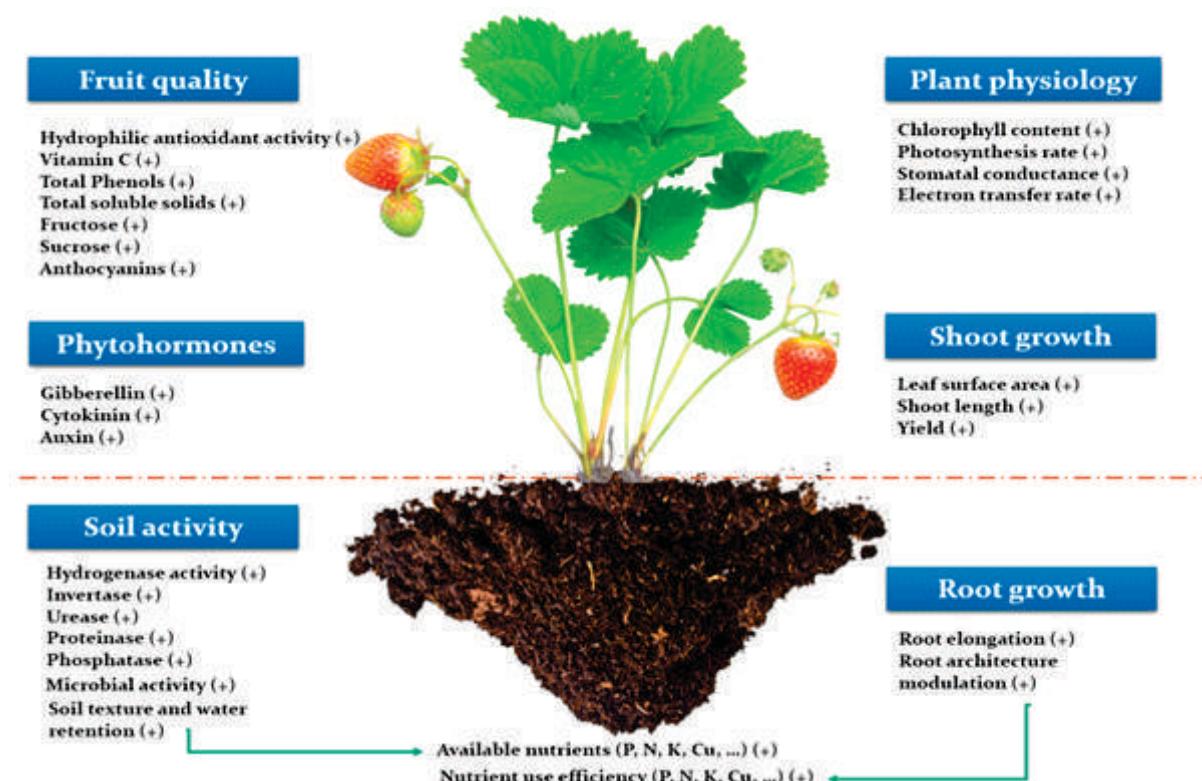
Seaweeds or macro algae are aquatic plants belonging to the plant kingdom Thallophyta. These are extracts from brown seaweeds. Examples: Ascophyllum, Fucus, and Laminaria genera

Effect of Seaweed Extracts on Plants:

- Growth promotion
- Nutrient uptake and availability
- Stress tolerance and resilience
- Diseases and pest resistance
- Flowering and fruiting

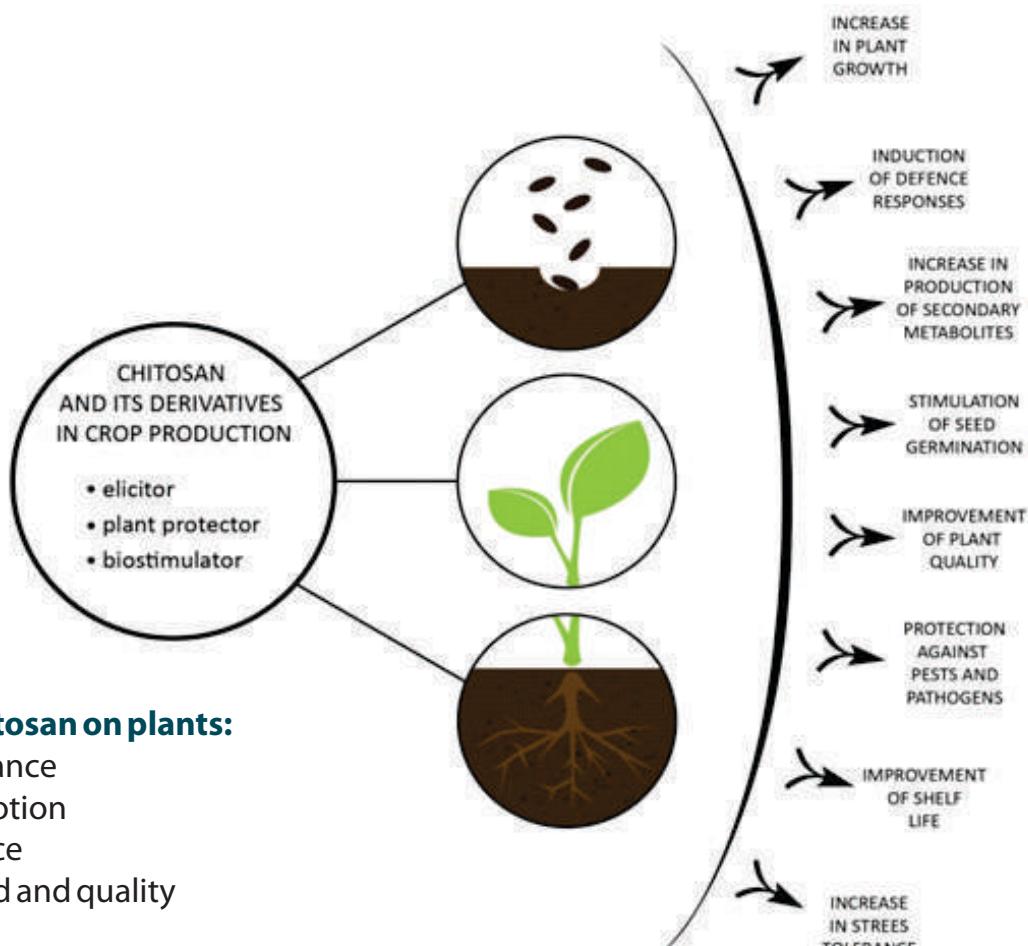
Effects of SW extracts on soil efficiency:

- Microbial activity stimulation
- Soil structure improvement
- Organic matter enrichment
- pH regulation
- Remediation of degraded soils



Chitosan and other Biopolymers

- Chitosan, a deacetylated product of the biopolymer chitin, synthesized through both naturally and artificially.
- The main source of commercial chitosan is the extensive deacetylation of its parent polymer chitin. It is present in green algae, the cell walls of fungi and in the exoskeleton of crustaceans.
- Chitosan induces defense genes and the reactive oxygen species scavenging system.
- Seed priming with chitosan makes seedlings more resistant to abiotic stress.



Effects of Chitosan on plants:

- Disease resistance
- Growth promotion
- Stress tolerance
- Increased yield and quality

Effect of chitosan on soil properties:

- Suppression of soil-borne pathogens
- Environmental benefits
- Nutrient retention and availability
- Soil structure improvement

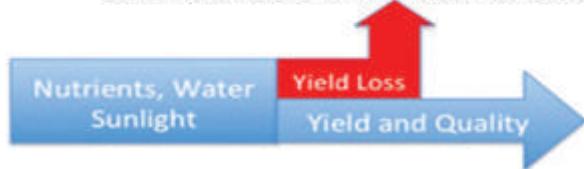
Microbial Inoculants:

- Microbial inoculants are mostly free-living bacteria, fungi, and arbuscular mycorrhizal fungi (AMF) which were screened from diverse situations such as soil, plants, plant residues, water and composted manures.
- Better assimilation of primary elements such as N, P and K has been found in the presence of PGPB (Plant growth promoting bacteria).
- Microbes in the inoculants, supply nutrients and help in plant growth. They also improve the quality of food.
- Enhance crop vigour, yields and quality and enhance plant survivability against both biotic and environmental stresses.

Yield loss due to stress responses and genetically determined biomass partitioning.

Effect of Microbial Inoculants in Plants

Nutrient availability and uptake
Disease suppression
Plant growth promotion



Effect of microbial inoculants on soil properties:

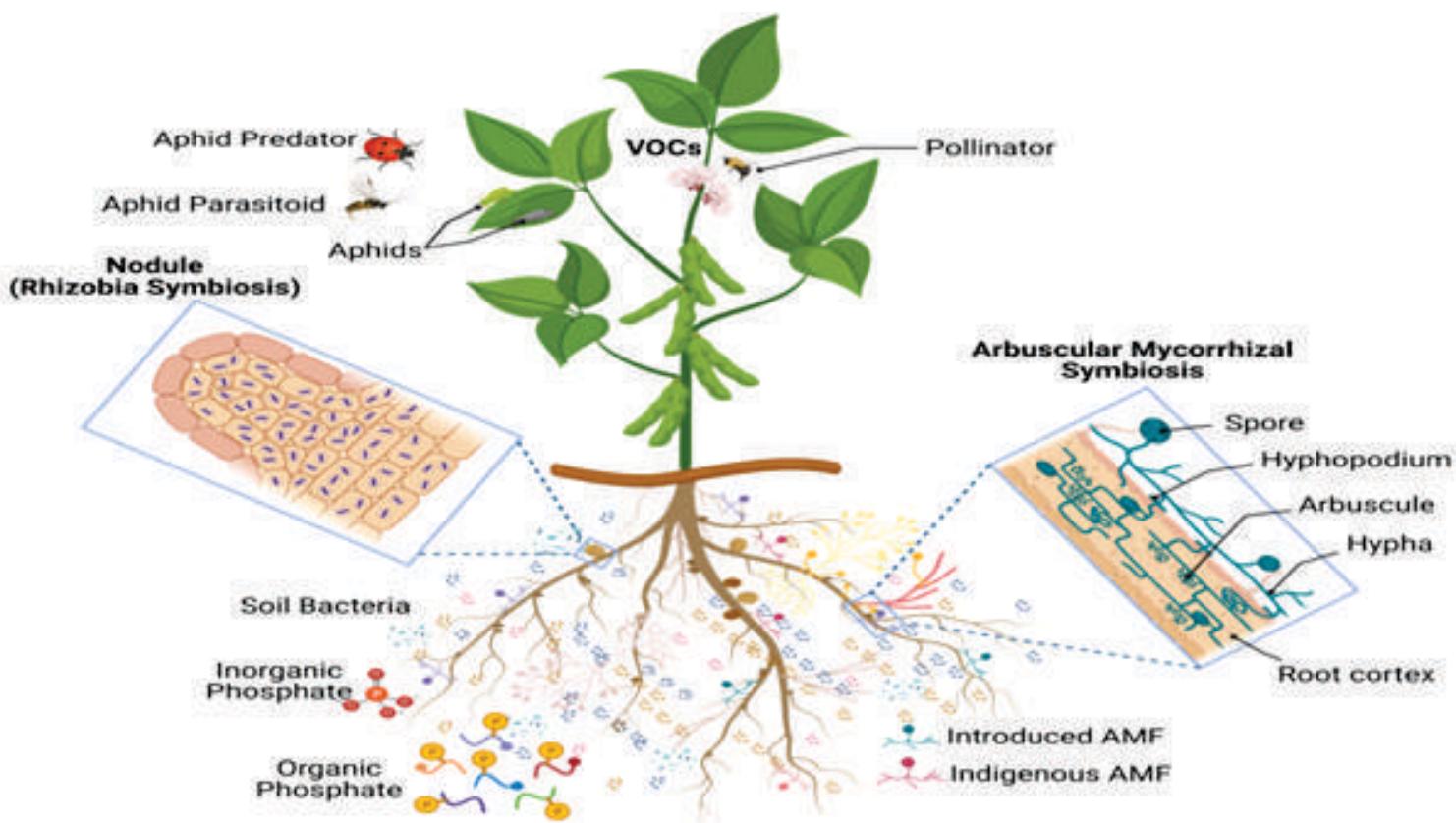
Soil microbiome diversity
Nutrient availability and cycling
Organic matter decomposition

Yield loss reduced due to diminished stress responses and favorable biomass partitioning.



Biostimulants in Agriculture:

- Decreases the chances of yield loss due to biotic and abiotic stresses
- Increases the crop vigour, crop quality and fruit size
- Increases the level of phyto hormones in the crop
- as well as plant conductancy to water



This shows that microbes like Nitrosomonas/Mycorrhiza/Pseudomonas convert atmospheric nitrogen to absorbed nitrate by inducing AMF in the root cortex which creates a symbiotic relationship in which the plant is benefitted in getting nitrate and microbes gain inorganic phosphate from their root nodules.

Nutrient Classification

There are different basis of classification of essential nutrients:

1. Quantity of nutrient required
2. Mobility of nutrient in soil
3. Mobility of nutrient within plant
4. Functions in plant

Classification on the basis of Quantity of Nutrient required

1. Basic Nutrients:

These constitute 96% of total dry matter of plant.

Name of Basic nutrients:

- Carbon
- Hydrogen
- Oxygen

Among these, carbon and oxygen constitute 45% each and hydrogen is 6%.

2. Macro Nutrients

The nutrients which are required by plants in large quantities are called macro or major nutrients. These are six in number.

Name of Macro nutrients:

- Nitrogen
- Phosphorus
- Potassium
- Calcium
- Magnesium
- Sulphur

Macro nutrients have again two categories:

Primary Nutrients Among macro nutrients, Nitrogen, Phosphorus and Potassium are known as primary nutrients which are required in a proper ratio for a successful crop.

Secondary Nutrients Next to primary nutrients, there are three elements such as Calcium, Magnesium and Sulphur which are known as secondary nutrients.

3. Micro Nutrients

These nutrients required by plants in small quantities and also known as minor or trace elements. These are eight in number

Name of Micro nutrients:

- Zinc
- Iron
- Manganese
- Copper
- Boron
- Molybdenum
- Chlorine
- Nickle

Classification on the basis of Mobility of Nutrient in the Soil:

Mobile nutrients: The nutrients are highly soluble and these are not adsorbed on clay complexes.

Example: NO_3^- , SO_4^{2-} , BO_3^{2-} , Cl^- and Mn^{+2}

Less mobile nutrients: They are soluble, but they are adsorbed on clay complex, so their mobility is reduced.

Example: NH_4^+ , K^+ , Ca^{+2} , Mg^{+2} , Cu^{+2}

Immobile nutrients: Nutrient ions are highly reactive and get fixed in the soil.

Example: H_2PO_4^- , HPO_4^{2-} , Zn^{+2}

Classification on the basis of Mobility with in Plant:

Highly mobile: N, P and K.

Moderately mobile:

Zn

Less mobile: S, Fe, Mn, Cl, Mo and Cu

Immobile:

Ca and B

Classification on the basis of Functions in the Plant:

1. Elements that provide basic structure to plant

Example: Carbon, Hydrogen and Oxygen

2. Elements useful in energy storage, transfer and bonding: These are accessory structural elements which are more active and vital for living tissues.

Example: N, S and P.

3. Elements necessary for charge balance.

Example: K, Ca and Mg.

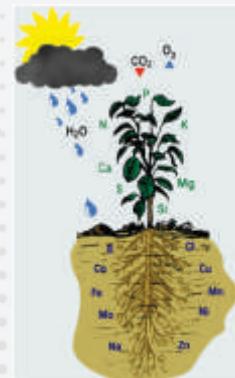
4. Elements involved in enzyme activation and electron transfer.

Example: Fe, Mn, Zn, Cu, B, Mo and Cl.

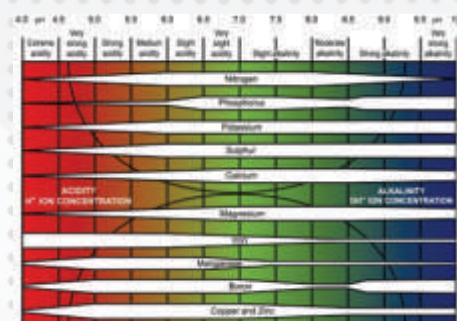
Beneficial nutrients

These are not included in essential nutrients, but their application increases the yield up to some extent.

Example: Sodium, Silicon, and Vanadium.



Plant nutrient absorption chart



pH chart with nutrient

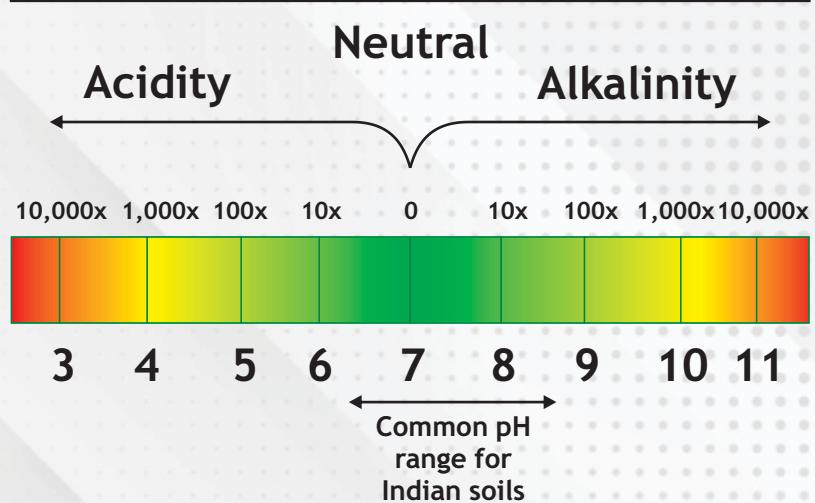
GENERAL CROP NUTRIENT

Nutrient	Deficiency Symptoms	Comments	Diseases	Product recommendation
Calcium (Ca)	New leaves (top of plant) are distorted or irregularly shaped. Causes blossom -end rot.	Desert soils and water generally have plenty of calcium, so deficiency problems are rare. Excessive calcium can limit the availability of other nutrients.	Bitter pit in Apple	Root o max gold @ 4-6 kg /acre and Zinc super gold @ 5-8 kg/Acre
Nitrogen (N)	General yellowing of older leaves (bottom of plant). The rest of the plant is often light green.	Most plants absorb nitrogen in the form of ammonium or nitrate. These forms readily dissolve in water and leach away.	Buttoning in cauliflower	Pardhan @ 1 kg/Acre OR Pardhan Plus @ 1 Kg/Acre OR Root-O-Max Ultra 3.5 Kg/Acre
Magnesium (Mg)	Older leaves turn yellow at edge leaving a green arrowhead shape in the center of the leaf	Magnesium is important nutrients, involved in many enzyme activities & structural stabilization of tissues in plants. In low pH soils, the solubility of Mg. decreases & it become less available.	Intervenial chlorosis in Apple and Citrus	Picaso gold@150-200 ml/Acre , Gajab ultra @ 70-80 ml/Acre, Root o max gold @ 4-6 kg/Acre , Zinc super gold @ 5-8 kg /Acre
Phosphorus (P)	Leaf tips look burnt, followed by older leaves turning a dark green or reddish-purple.	Plants absorb phosphorus in the form of phosphate. This form dissolves only slightly in water, but pH strongly affects uptake.	Stunting in early stage of plants	Pardhan @ 1 kg/Acre , Root o max gold @ 4-6 kg /Acre , Indo mycorrhiza @ 4-6 kg /Acre
Potassium (K)	Older leaves may wilt, look scorched. Interveinal chlorosis begins at the base, scorching inward from leaf margins.	Plants absorb potassium as an ion, which can be readily leached from soil. Desert soils and water generally have plenty of potassium, so deficiency problems are rare.	Drying back tips of shoots	Pardhan Plus@1 kg /Acre, Root o max gold @ 4-6 kg/Acre Indo Breeza@ 100g/Acre, Pradhan@1 Kg/Acre.
Sulphur (S)	Younger leaves turn yellow first, sometimes followed by older leaves.	Plants absorb sulfur in the form of sulfate. This readily leaches from the soil. Sulfur may acidify the soil (lower the pH).	Younger leaf suffering from chlorosis with there tips becoming necrotic.	Root o max gold @ 4-6 kg /acre and Zinc super gold @ 5-8 kg/Acre , Kargill DF @ 750-1000 gm/Acre ROMU@3.5Kg/Acre
Boron (B)	Terminal buds die, witches' brooms form.	Plants absorb boron in the form of borate. Problems are seen in intensively cropped areas.	Bowing or hollow stem in Cauliflower, Heart rot of sugarbeet and Marigold , Top sickness of tobacco , Internal necrosis in Mango , Fruit cracking of tomato and pomegranate	Picaso Power@150-200gm Acre, Jagromin 99@250-400ml/Acre , Bloom flower@1-2 kg/acre Gajab Ultra@70-80 ml/Acre.
Copper (Cu)	Leaves are dark green, plant is stunted.	Plants absorb copper as an ion. Arizona soils have plenty of copper, so problems are rare.	Die back of shoots in citrus, Little leafin citrus , Rough bark and cracking in Apple	Picaso gold@100-200 ml/Acre , Gajab ultra @70-80 ml/Acre, Root o max gold @ 4-8 kg/Acre , Jagromin 99@250-400 ml/Acre

Nutrient	Deficiency Symptoms	Comments	Diseases	Product recommendation
Iron (Fe)	Yellowing occurs between the veins of young leaves.	Plants absorb iron as an ion through their foliage as well as their roots. Uptake is strongly affected by pH. Chelated iron is readily available for use by the plant, other forms of iron may be tied up in the soil.	lime induced chlorosis .	Picaso gold @ 150-200 ml/Acre, Root o max gold @ 4-6 kg /Acre OR Picaso Power@150-200 gm/Acre, Picaso Ultra@500-600 gm/Acre
Manganese (Mn)	Yellowing occurs between the veins of young leaves. Pattern is not as distinct as with iron. Palm fronds are stunted and deformed, called "frizzle top". Reduction in size of plant parts (leaves, shoots, fruit) generally. Dead spots or patches.	Plants absorb manganese as an ion through their foliage as well as their roots.	Gray speck of Oat, Speckled yellow of sugarbeet, Maash spot of Peas , Pahala blight of Sugarcane , Frenching of tung trees	Gajab ultra @70-80 ml/Acre OR Picaso gold @150-200 ml/Acre OR Jagromin 99@ 250-400 ml/Acre OR Picaso Power@150-200 gm/Acre. OR Picaso Ultra@500-600 gm/Acre
Molybdenum (Mo)	General yellowing of older leaves (bottom of plant). The rest of the plant is often of molybdate. Problems light green.	Plants absorb molybdenum in the form molybdate. Problems are rare in Arizona soils but are occasionally seen on legumes where it mimics nitrogen deficiency.	yellow spot in Citrus , Scald of leaves , Downward cupping in radish	Gajab ultra @ 70-80 ml /Acre, Picaso Ultra @ 500-600 gm/Acre
Zinc (Zn)	Terminal leaves may be rosetted, and yellowing occurs between the veins of the new leaves.	Plants absorb zinc as an ion through their foliage as well as their roots. High pH may limit availability	White bud in maize , Khaira diseases in rice , little leaf in Mango, Litchi and Cashew.	Zinc super gold @ 5-8 kg /Acre , Sona shree gold @ 250 gm/Acre, Root o max gold @ 4-6 kg/Acre



Soil pH Ranges



Fertilizer Management

S.No.	NAME OF FERTILIZERS	NUTRIENT CONTENT (IN kg) (FCO specification)		
		N ₂ %	P ₂ O ₅ %	K ₂ O %
1.	Dung Manure	0.5	0.2	0.5
2.	Compost Manure	0.5	0.15	0.5
3.	Chicken Beet Manure	5.5	4	2
4.	Neem Compost	5.2	1	1.4
5.	Vermi Compost	3.0	1	1.5
6.	Urea	46	0	0
7.	Ammonium Sulphate	20.6	0	0
8.	Calcium Ammonium Nitrate	26	0	0
9.	Single Super Phosphate	0	16	0
10.	Rock Phosphate	0	18	0
11.	Murate of Potash	0	0	60
12.	Potassium Sulphate	0	0	50
13.	Di Ammonium Phosphate	18	46	0
14.	Ammonium Sulphate Nitrate (CAN)	27	0	0
15.	Calcium Nitrate	15.5	0	0
16.	Mono Ammonium Phosphate (MAP)	12	52	0
17.	NPK (19:19:19)	19	19	19
18.	NPK (17:17:17)	17	17	17
19.	Nitrophosphate with Potash	15	15	15
20.	NPK (10:26:26)	10	26	26
21.	NPK (12:32:16)	12	32	16
22.	Potassium Nitrate	13	0	45
23.	NPK (12:32:16)	12	32	16
24.	NPK (14:28:14)	14	28	14
25.	NPK (15:15:15)	15	15	15
26.	Ammonium Phosphate Sulphate	16	20	0
27.	NPK (6:12:36)	6	12	36
28.	NPK (14:35:14)	14	35	14
29.	NPK (13:5:26)	13	5	26
30.	NPK (13:40:13)	13	40	13
31.	NPK (22:22:11)	22	22	11
32.	Potassium Phosphate	0	52	34
33.	Zinc sulphate (Hepta Hydrate)	Zinc (Zn) - 21 %		
34.	Zinc sulphate (Mono Hydrate)	Zinc (Zn) - 33%		
35.	Manganese sulphate	Manganese (Mn) - 30.5%		
36.	Ferrous sulphate	Iron (Fe) - 19%		
37.	Copper sulphate	Copper (Cu) - 24%		
38.	Borax (Sodium Tetraborate)	Borene (Bn) - 10.5%		
39.	Magnesium sulphate	Magnesium (Mg) - 9.6%		
40.	Chelated Zinc (Fe-EDTA)	Zinc (Zn) - 12%		
41.	Sulphur	Sulphur (S) - 90%		
42.	Ammonium Molybdate	Molibet (Mo) - 52%		
43.	Boric Acid			
44.	Rhizobium			
45.	Azotobacter			
46.	Azospirillum			
47.	City Compost			
48.	Pressmud			
49.	Mycorrhizal Bio fertilizers			

Crop's Seeds Sowing Time

CROP NAME	RIGHT TIME	LATE TIME	SEEDS QTY. (kg / hectare)
Wheat	10th Nov. - 25th Nov.	25th Nov.-10th Dec.	Timely Sowing – 125 kg. Late Sowing – 130 Kg. Very Late Sowing – 150 Kg.
Barley	20th Oct. - 7th Nov.	15th Nov – 15th Dec.	75-100 kg.
Maize	May - June	15th July	25-35 kg.
Pearl millet	March – July	N/A	8-10 kg.
Paddy	June - July	Transplanting in (July- Aug)	25-40 Nursery
Sorghum	June - July	N/A	15-20 kg.
Rai / Mustard	30th Sept – 15th Oct.	N/A	5-6 kg.
Toria / Lahi	1st Sept. - 15th Sept.	N/A	4-5 kg.
Yellow Sarson	25th Sept. - 15th Oct.	N/A	5-6 kg.
Tara Mira	October	N/A	5-6 kg.
Sesamum	June – July	N/A	3-5 kg.
Groundnut	June – July	N/A	70-75 kg.
Linseed	Oct. – Nov.	N/A	30-40 kg.
Soybean	June – July	N/A	70-75 kg.
Castor	June – July	N/A	15 Kg.
Sunflower	Feb-March July – Aug./ Nov.	N/A	6-7 Kg.
Gram / Chickpea	Oct. – Nov.	N/A	75-80 kg.
Pea	Oct. – Nov.	N/A	80-100 kg.
Lentil	Oct. – Nov.	N/A	40-60 kg.
Mung Bean/Green Gram	Feb./ April / July	N/A	25-30 kg.
Urd Bean/Black Gram	Feb./ March / July	N/A	25-30 kg.
Pigeonpea/Red gram	Feb. / June / July	N/A	12-15 kg.
Cowpea	Feb./April	N/A	30-40kg.



COTTON

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: 0-60 days	Field Preparation & Soil Health Seed Treatment Termite Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold@4-6kg/Acre OR Indo Mycorrhiza @4-6 kg/Acre OR ROMU@3.5kg./Acre OR Zinc Super Gold@5-8kg/Acre OR Sriculan Gold@5-8kg/Acre Acer@2-2.5gm/kg Seed, Savera@4 ml/kg Seed & Indo Biogold@1-1.5 gm/kg Seed Spine@320-350 ml/acre OR Jabar@ 50 gm/Acre Penda Shree@1000-1200 ml /acre OR Penda Power@600-700 ml/Acre OR Factor @ 300-350 ml./Acre.	Broad casting Dry application With Irrigation/ Broadcasting Foliar spray
2	Window 2: Vegetative growth stage (60-90 days)	White Fly, Jassid, Aphid, Thrips & Mealy Bug Bollworms (ABW, SBW PBW & Tobacco Cut Worm) Nutrient Corrector & Vigour Enhancer Leaf Spot Disease	Prize@ 20-40 gm/Acre OR Port@400 ml/Acre OR Spine - 320-350ml/Acre OR Port@200 ml/Acre OR Dawn 2000@ 40-50 ml/Acre OR Spiderman@240ml/Acre Blunt@ 400 ml/Acre, Pyrifén@240ml/Acre Indogen@60ml/Acre OR Dominator@75-90 gm/Acre OR Plano Gulf@80 ml/Acre OR Rusban-500-750ml/Acre Corsa@600 ml/acre OR Baton 200-250 ml/Acre OR Spine@320-350ml/Acre OR Farrate@120-200 ml/Acre Indo Apache@250gm/Acre OR Jagromin 99@250-400ml/acre OR Biogold@100-120gm/Acre OR Empire@240g/Acre Pradhan@800-1000 gm/Acre OR Pradhan Plus@800-1000 gm/Acre Gajab Ultra@200-250 ml/Acre. Logic@ 100-200 ml/Acre OR Acer@400-500 gm/Acre	Foliar spray Foliar spray Foliar spray repeat at 15 days interval
3	Window 3: Flowering & boll development stage (90-120 days)	White Fly Aphid, Jassid & Thrips Antracnose, Boll Rot, Alternaria Leaf Blight Nutrient Corrector & Vigour Enhancer Plant stress condition & Bacterial Disease	Port@400ml/Acre OR Prize @20-40 gm/Acre Prominent@50-60 gm/Acre OR Spine@320-350 ml/Acre OR Plano Gulf@ 80 ml/Acre OR Indogulf Sitara@40-80gm/acre OR Blunt@400 ml/Acre Logic@100-200 ml/acre OR Acer@400-500gm/acre OR Srizole@200-250 ml/acre. Repeat need basis suggested in window 2.	Foliar spray
4	Window 4: Boll maturity stage (>120 days)	Cotton Leaf Curl Virus White Fly, Jassid, Aphid, Thrips, Mealy Bug & Bollworms	Port @ 400 ml/Acre OR Prize @20-40 gm/Acre Repeat need basis suggested in window 2 & 3.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Commelina benghalensis



Thrips



Alternaria leaf spot



Cyanotis axillaris



White fly



Rust



Cynodon dactylon



Jassid



Viral diseases



Euphorbia geniculata



Mealy bug



Wilt



Sorghum halepense



Aphid



Boll rot



MAIZE

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Seed Establishment 0-30 days	Soil Health Seed Treatment Termite Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold @ 4-6kg /Acre OR Indo Mycorrhiza @4-6 kg/Acre OR ROMU@3.5kg./Acre OR Zinc Super Gold@5-8kg/Acre. Acer@2-2.5gm/kg Seed, Savera@3 ml/kg Seed & Indo Biogold@1-1.5 gm/kg Seed Spine@320-350 ml/acre OR Jabar@50 gm/Acre Alkazar@115 gm/Acre Ruszine @ 400-800 gm/acre OR Cutoff 58@ 350-500 ml/Acre OR Cutoff@ 1000-1200 ml/Acre OR Cutoff 80@350-500 gm/Acre OR Fire@800-1000 ml/Acre.	Broad casting Dry application With Irrigation Foliar spray
2	Window 2: Vegetative growth stage (30-60 days)	White Fly, Jassid, Aphid & Thrips Bollworms (Stem Borer, Pink Borer & Army Borer) Leaf Spot Disease Nutrient Corrector & Vigour Enhancer	Prize @ 20-40 gm/Acre OR Dawn 2000@ 40-50 ml/Acre OR Indogulf Sitara@40-80 gm/Acre Dominator @ 80-100 gm/Acre OR Plano Gulf @ 50 ml/Acre OR Corsa@400-600 ml/acre OR Baton 200-250 ml/Acre OR Srigent GR@7.5-10Kg/Acre OR Rogorus@ 270-470 ml/ Acre. Logic@100-200 ml/Acre OR Acer@400-450 gm/Acre Indo Apache@250gm/Acre Biogold@100-120g/Acre OR Pradhan@800-1000 gm/Acre OR Sonashree Gold@250g/Acre Empire@240g/Acre OR Gajab Ultra@200-250 ml/Acre	Foliar spray Foliar spray Foliar spray repeat at 15 days interval
3	Window 3: Tessel & Silk Formation stage (60-85 days)	Bollworms (Army Worm & Cob Borer) Leaf Blight, Stem Rot, Smut and Rust Nutrient Corrector & Vigour Enhancer Plant stress condition & Bacterial Disease	Dominator@80-100 gm/acre OR Corsa @ 400-600 ml/acre OR Plano Gulf @50 ml/acre OR Baton@ 200-250 ml/acre. Tango Super @ 200 ml/acre OR Figon @ 200-300 ml/acre OR Shree M-45 @ 600-800 gm/acre OR Bactro Plus Gold@20-40 gm/acre Repeat need basis suggested in window 2. Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre	Foliar spray
4	Window 4: Cob Maturity Stage (>85 days)	Jassid, Aphid Mealy Bug & Cob Borer	Repeat need basis suggested in window 2 & 3.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Commelina benghalensis



Shoot fly



Leaf blight



Cyanotis axillaris



White grub



Smut



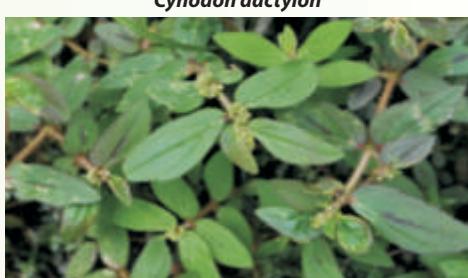
Cynodon dactylon



Pod borer



Stem rot



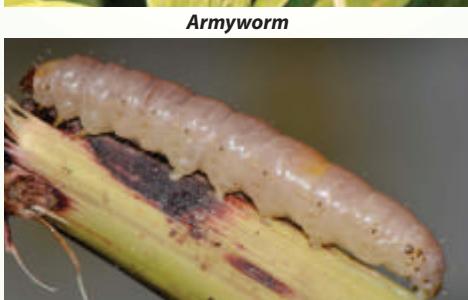
Euphorbia geniculata



Armyworm



Sorghum halepense



Pink borer larva



Angular leaf streak



RICE

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery establishment 0-40 days	Soil Health Seed Treatment Termite Plant Growth and Nutrition Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold@4-6kg /Acre OR Indo Mycorrhiza @4-6 kg/Acre OR ROMU@3.5kg./Acre OR Zinc Super Gold@5-8kg/Acre & Sriculan Gold@5-8kg/Acre OR Sona Shree Gold @500 gm/Acre. Acer@2-2.5gm/kg Seed, Savera@1 ml/kg Seed & Indo Biogold@1-1.5 gm/kg Seed Spine@200-250 ml/acre OR Jabar@60 gm/Acre OR Srigent GR@7.5-10 kg/Acre Picaso Gold@150-200 ml/Acre OR Indo Biogold @100-120gm/Acre OR Empire@240g/acre Krift@400-600ml/acre OR Orion Gold@80-100 ml/Acre Factor@250-300ml/Acre OR Gulftop@40-60gm/Acre OR Penda Shree@1000-1200ml/Acre OR Indomix Power@8g/Acre OR Oxytech@200-400 ml/Acre	Broad casting Dry application With Irrigation Foliar spray Foliar spray
2	Window 2: Vegetative growth to Panicle Initiation stage (40-100 days)	Stem Borer & Leaf Folder Root Rot & Leaf Spot Disease Sheath Blight & Bacterial Blight Nutrient Corrector & Vigour Enhancer	Indogen@60ml/ Acre OR Furtex@4kg/Acre OR Kranti 4g @ 7.5-10 kg/acre OR Sitara@40 gm/acre Baton@ 100 ml/acre OR Spine@200-250 ml/acre OR Plano Gulf@60-80 ml/acre OR Srigent GR@ 7.5-10kg/Acre OR Farrate@100-120ml/Acre Srigent Ultra@4kg/Acre Acer@500 gm/acre OR Logic@100-200 ml/Acre Indo Apache@250gm/Acre Refery@300ml/Acre Buzzer@200-400ml/acre OR Figon@250-300 ml/Acre OR Logic@100-200 ml/acre OR NectorPlus@400ml/Acre Picaso Gold@200-250 ml/Acre OR Jagromin 99@250-400 ml/Acre OR Sonashree Gold@250g/Acre OR Gajab Ultra@200-250/Acre OR Empire@240g/Acre.	Foliar spray Foliar spray Foliar spray Foliar spray repeat at 15 days interval
3	Window 3: Heading stage (100-125 days)	Brown Plant Hopper & Leaf Hopper Neck Blast Leaf Spot Plant stress condition & Bacterial Disease	Dhamaal@120 gm/Acre OR Blunt Ultra@500ml/Acre OR Spine@200-250 ml/Acre OR Lehar@200-600ml/Acre OR Prominent@60-80gm/Acre OR Paarth@133.2gm/Acre Jabar@50gm/Acre. Veer@120-160gm/acre OR Shree M-45@600-800gm/Acre Figon@250-300 ml/Acre OR Tango Super@200-250 ml/Acre OR Buzzer@200-400 ml/Acre. Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre	Foliar spray
4	Window 4: Soft Dough to Hard Dough Stage (>125 days)	WBPH, BPH, Neck Blast Leaf Spot, Bacterial Diseases	If required repeat need basis spray suggested in window 2 & 3.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Commelin Spp



Leaf folder



Brown spot



Cyperus difformis



Brown plant hopper



False smut



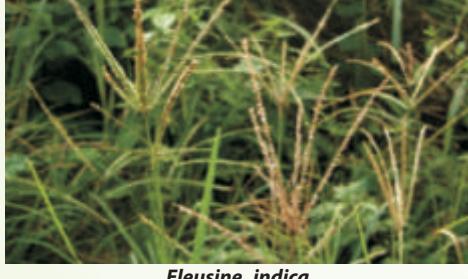
Echinocloa



Stem borer



Neck blast



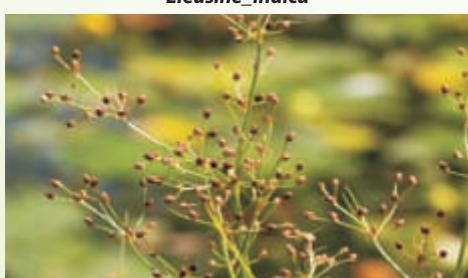
Eleusine indica



Termite



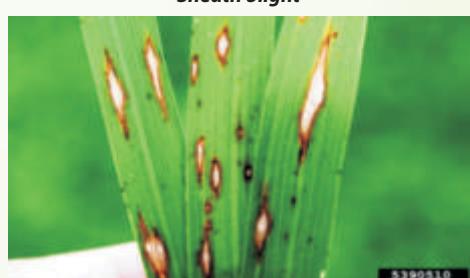
Sheath blight



Fimbristylis Milliaceae



Nematode



leaf spot



SOYBEAN

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Seed Establishment (0-30 days)	Soil Health Seed Treatment Termite Nematode Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold@4-6kg /acre OR Indo Mycorrhiza @4-6 kg/acre OR ROMU@3.5kg./acre OR Zinc Super Gold@5-8 kg/acre Acer@ 2-2.5gm/kg Seed, Savera@4 ml/kg Seed & Indo Biogold@1-1.5 gm/kg Seed Spine@320-350 ml/Acre OR Jabar@50 gm/Acre Penda Shree@1000-1200 ml/Acre OR Penda Power@600-700 ml/Acre OR Shaktiban@300-400 ml/Acre OR Arjun-32@1000-1200 ml/Acre.	Broad casting Dry application With Irrigation Broad casting Foliar spray
2	Window 2: Vegetative growth to Flowering stage (30-50 days)	White Fly, Jassid, Aphid & Thrips Stem Borer Nutrient Corrector & Vigour Enhancer Charcoal Rot & Collar Rot	Spine@320-350 ml/Acre OR Sitar@40-80 gm/acre OR Port@200ml/Acre Prize@20-40 gm/Acre. Dominator@80-100 gm/Acre OR Corsa@400-600 ml/acre OR Baton 200-250 ml/Acre Furarus@10-15Kg/Acre. IndoApache@ 250gm/Acre Or Picaso Gold@200-250 ml/Acre OR Biogold@100-120 gm/Acre OR Pradhan@1Kg./Acre OR Sonashree 33@250g/Acre OR Empire@240g/Acre OR Gajab Ultra@200-250 ml/Acre Remote Power@ 300 gm/Acre OR	Foliar spray Foliar spray Foliar spray repeat at 15 days interval Foliar spray
3	Window 3: Begining Pod to Seed Formation stage (50-90 days)	Bollworms (Pod Borer & Stem Borer) Pod Blight, Leaf Spot & Rust Nutrient Corrector & Vigour Enhancer Plant stress condition & Bacterial Disease	Indogen@60ml/Acre OR Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Plano Gulf@50 ml/acre OR Baton@120 ml/acre. Acer@200-250 gm/acre OR Srizole@200-250 ml/Acre Figon@250 ml/acre OR Fang@500 gm/Acre Buzzer@200-250 gm/acre OR Bactro Plus Gold@20-40 gm/acre Repeat need basis suggested in window 2. Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre	Foliar spray
4	Window 4: Pod Maturity Stage (>90 days)	Jassid, Aphid, Pod Borer, Hairy Caterpillar, Leaf Blight, & Anthracnose.	Repeat need basis spray suggested in window 2 & 3.	Foliar spray

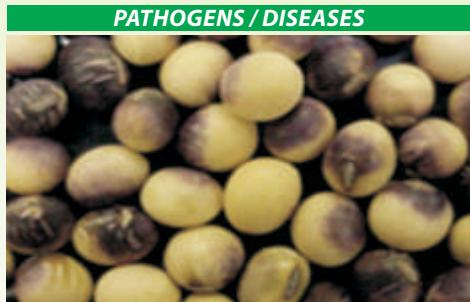
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Connellina benghalensis



Helicoverpa armigera



Cercospora leaf spot



Cyanotis axillaris



Semilooper



Charcoal rot



Cynodon dactylon



Tobacco caterpillar



Root rot



Euphorbia geniculata



White fly



leaf curl virus



Sorghum halepense



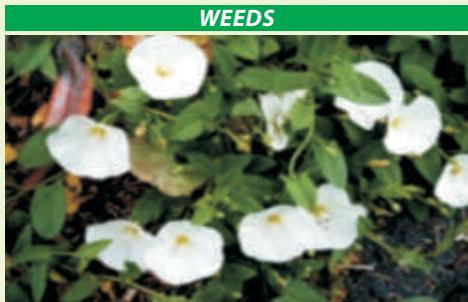
Soybean Leaf Beetle



SUGARCANE

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Germination phase (0-60 days)	Soil Health Seed Treatment Termite & White grub Nematode Weeds (BLWs, Sedges and Grasses) Root Rot & Wilt	Root-o-Max Gold@8-12kg/acre OR Indo Mycorrhiza@8-12 kg/acre OR ROMU@4-6kg./acre OR Zinc Super Gold & Plus@5-8 kg/acre OR Sriculan Gold@5-8 kg/Acre Acer@2-2.5gm/kg Seed, Savera@7-8 ml/kg Seed Indo Biogold@2-5 gm/kg Seed Spine@400 ml/Acre OR Jabar@65 gm/Acre OR Srigent@8-10 Kg/Acre OR Dawn 2000@140 ml/Acre. Trick@100-120 gm/Acre OR Cut Off 38@1400-2000 ml/Acre Ruszine@800-1000 gm/Acre OR Cut off 58@600-1000ml/acre Remote Power@200-400 gm/acre OR Logic@100-200 ml/acre.	Broad casting Dry application With Irrigation Broad casting Foliar spray Drenching
2	Window 2: Formative phase (60-130 days of planting)	Scale Insect, Early Shoot Borer & Wooly Aphid Nutrient Corrector & Vigour Enhancer	Srigent GR@8-10 kg/acre OR Sitar@40-80 gm/acre OR Planogulf@80 ml/Acre Dawn 7000@12-14 gm/acre OR Dominator@80-100gm/Acre OR Srigent Ultra@4kg/Acre Picaso Power@200-250 gm/Acre OR Pradhan@800-1000 gm/Acre OR Sonashree 33@250 gm/Acre OR Empire@240g/Acre OR Picaso Gold@150-200 ml/Acre Zinc Super Gold@5-8Kg./Acre OR Indo Breeza@100 gm/Acre OR Gajab Ultra@200-250 ml/Acre. Indo Apache@250gm/Acre	Foliar spray Foliar spray repeat at 15 days interval
3	Window 3: Grand phase (130-250 days of Planting)	Top Stem Borer, Root Borer, Wooly Aphid, Pyrilla, Leaf Hopper, White Fly Stem Rot & Leaf Spot Plant stress condition & Bacterial Disease	Indogen@150ml/Acre OR Furtex@7.5kg/Acre OR Corsa@400-600 ml/acre OR Kranti 4G@7.5-10 Kg/Acre OR Spine@400ml/acre OR Rusban@ 300-600 ml/acre Or Jabar@65 gm/Acre. Acer@500 gm/acre OR Figon@200-300 ml/acre OR Buzzer@200-250 gm/acre. Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre.	Foliar spray
4	Window 4: Maturity phase (>250-365 days of Planting)	Top Stem Borer, Root Borer, Wooly Aphid, Pyrilla, Leaf Hopper, White Fly Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 2 & 3. Repeat need basis spray suggested in window 2.	Foliar spray Foliar spray repeat at 15 days interval

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Convolvulus arvensis



Early stem borer



Wilt



Ecinoclova



Pyrilla



Red rot



Jagli palak



Termite



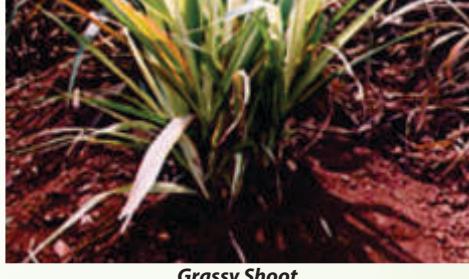
Grassy Shoot



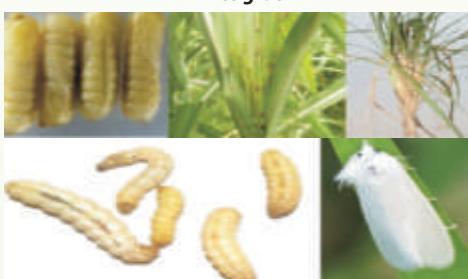
Krishan neel



White grub



Sorghum Helepan



Sugarcane top borer



Grassy stunt virus



GROUND NUT

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Germination Stage (0-30 days)	Soil Health	Root-o-Max Gold@4-6 kg/acre OR Indo Mycorrhiza @4-6 kg/acre OR ROMU@3.5kg/acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre	Broad casting
		Seed Treatment	Acer@2-2.5gm/kg Seed, Savera@4ml/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite & White Grub	Spine@320-350ml/Acre OR Jabar@50gm/acre OR Srigent GR@7.5-10Kg/Acre	With Irrigation
		Nematode		Broad casting
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200ml/Acre OR Shaktiban@400-600 ml/Acre OR Oxytech@200-400ml/Acre.	Foliar spray
		Root Rot & Wilt	Acer@200-250 gm/Acre OR Remote Power@300 gm/Acre.	Foliar spray
2	Window 2: First Leaf to Beginning of Blooming (30-50 days)	White Fly	Prize@20-40 gm/acre	
		Aphid, Jassid, Leaf Hopper & Thrips	Planogulf@ 60 ml/acre OR Rusban@400-450 ml/Acre OR Spine@320-350 ml/acre OR Dawn 7000@12-14 gm/acre OR Dawn 2000@40-50 ml/acre.	
		Leaf Spot, Tikka & Rust	Acer@500 gm/Acre OR Shree-M45@600-800 gm/Acre OR Buzzer@200-250 ml/Acre OR Nector Plus@600ml/Acre Srizole@200-250 ml/Acre OR Indo Apache@500gm/Acre OR Figon@200-300 ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Empire@240gm/Acre OR Gajab Ultra-200-250ml/Acre Pradhan & Plus @800-1000 gm/Acre Picaso Gold@200-250 gm/Acre OR Indo Breeza@100 gm/Acre OR Jagromin 99@250-400 ml/Acre.	
3	Window 3: Beginning Pod to Full Pod Formation stage (50-80 days)	Spodoptera & Hairy Caterpillar	Dominator@80-100 gm/acre OR Plano Gulf@60 ml/acre OR Farrate@80-120ml/Acre. Baton@200-250 ml/acre.	
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window2	Foliar spray
		Plant stress condition & Bacterial Disease	Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre.	
4	Window 4: Pod Maturity Stage (80-120 days)	Spodoptera, Thrips, Hairy Caterpillar, Jassid, Leaf Hopper, Aphid, White Fly, Leaf Minor, Leaf Spot, Rust	Repeat need basis spray suggested in window 2 & 3.	Foliar spray
		White Grub	Srigent GR@7.5 -10 kg/acre.	Broad casting

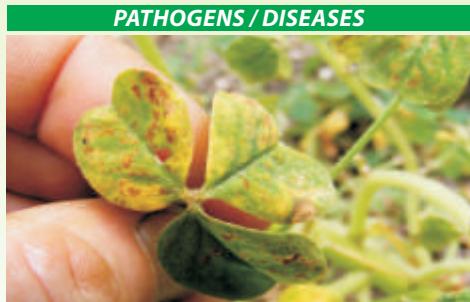
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Trianthema portulacastrum



Spodoptera



Rust



Amaranthus viridis



White grub



Late Leaf Spot



Jassid



Early Leaf Spot



Cyperus rotundus



Aphid



Hairy Caterpillar



Thrips



PEPPERMINT

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Germination Stage (0-30 days)	Soil Health	Root-O-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre OR Sriculan Gold@5-8 Kg/Acre.	Broad casting
		Seed Treatment	Acer@2-2.5gm/kg Seed + Savera@7-8 MI/kg Seed + Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite	Spine @ 400 ml/Acre OR Jabar@65gm/Acre	With Irrigation
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/Acre OR Oxytech@200-300ml/Acre OR Penda Power@600-700 ml/Acre OR Arjun-32@1000-1200 ml/acre.	Foliar spray
2	Window 2: Seedling Establishment (30-50 days)	White Fly, Aphid, Jassid and Leaf Minor	Prize@20-40 gm/acre OR Spine@400 ml/acre OR Dawn 7000@12-14 gm/acre OR Dawn 2000@40-50 ml/acre.	
		Nutrient Corrector & Vigour Enhancer	Indo Apache@250gm/Acre Picaso Gold@200-250 ml/acre OR Indo Biogold@100-120 gm/acre OR Empire@240 gm/acre OR Sona Shree 33 & Gold@250gm/Acre OR Pradhan@800-1000 gm/Acre.	Foliar spray
3	Window 3: Vegetative Growth stage (50-70 days)	Leaf Blight, Wilt, Rust	Remote Power@200-400 gm/acre OR Bactro Plus Gold@ 20-40 gm/acre OR Refery@250-300 ml/acre OR Logic@100-200ml/acre OR Acer@ 500gm/acre.	
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 2.	Foliar spray
		Plant stress condition & Bacterial Disease	Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre.	
4	Window 4: Vegetative Growth stage (70-100 days)	Heliothis, Moth	Dominator@80-100 gm/ acre OR Planogulf@60 ml/acre OR Corsa@400-600 ml/acre OR Baton@200-250 ml/acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@150-200 ml/acre OR Indo Biogold@100-120 gm/acre OR Empire@240 gm/acre OR Sona Shree 33 & Gold@250gm/Acre OR Pradhan@800-1000 gm/Acre.	Broad casting

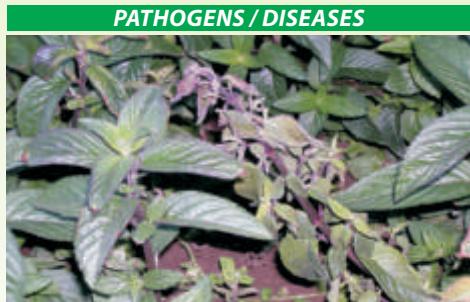
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Euphorbia geniculata



White fly



Verticillium wilt



Cynodon dactylon



Aphid



Leaf hopper



Jassid



Yellow spot



Sorghum halepense



Termite



Rust



Heliothis



WHEAT

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Germination Stage (0-10 days)	Soil Health	Root-o-Max Gold@4-6kg /acre OR Indo Mycorrhiza @4-6 kg/acre OR ROMU@3.5kg./acre OR Zinc Super Gold@5-8 kg/acre OR Sona Shree Gold@500 gm/Acre OR Sriculan Gold@ 5-8 kg/Acre	Broad casting
		Seed Treatment	Savera@1 ml/kg Seed, Rexcel DS@7-8 gm/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite	Spine@200-250 ml/acre OR Jabar@50 gm/Acre Srigent GR@8-10 kg/Acre	With Irrigation
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/acre OR Penda Power@600-700 ml/acre	Foliar spray (Pre-em.)
2	Window 2: Crown Root Initiation (20-25 days)	Weeds (BLWs, Sedges and Grasses)	Weeder@13.5 gm/Acre + Alto@8gm/Acre OR Cut Off 58@350-500 ml/Acre OR Cut Off 38@550-850 ml/Acre OR Trick@100gm/Acre OR Jai Ho@160 gm/Acre OR Jai Ho Plus@ 240gm/Acre	Foliar spray (Post-em.)
		Nutrient Corrector & Vigour Enhancer	Pradhan@800-1000 gm/acre OR Picaso Gold@150-200 ml/acre OR Gajab Ultra@70-80 ml/Acre OR Indo Apache@500gm/Acre	Foliar spray
3	Window 3: Active Tillering to Flag Leaf Stage (40-45 days)	Aphid & Jassid	Rogorus@400ml/Acre.	
		Termite	Spine@200-250 ml/Acre OR Jabar@50gm/Acre	
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@200-250 ml/Acre OR Jagromin 99@ 250-400 ml/Acre OR Empire@240 gm/Acre OR Gajab Ultra@200-250ml/Acre OR Sona Shree 33@250 gm/Acre OR Indo Apache@500gm/Acre.	Foliar spray
4	Window 4: Late Jointing (70-75 days) to Flowering Stage (90-95 days of Sowing)	Loose Smut, Rust & Powdery Mildew	Buzzer@200-250 gm/acre OR Figon@250-300 ml/acre OR Acer@300-350 gm/acre OR Logic@100-200 ml/Acre OR Shree M-45@600-800 gm/Acre OR Srizole@200-250 ml/acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	If required repeat need basis spray suggested in window 2&3.	
5	Window 4: Soft Dough to Hard Dough Stage (110-120 days)	Aphid, Jassid, Termite, Loose Smut, Rust & Powdery Mildew	If required repeat need basis spray suggested in window 3 & 4.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Anagallis arvensis



Aphid



Yellow rust



Chenopodium album



Armyworm



Loose smut



Convolvulus arvensis



Termite



Karnal bunt



Phalaris minor



Brown rust



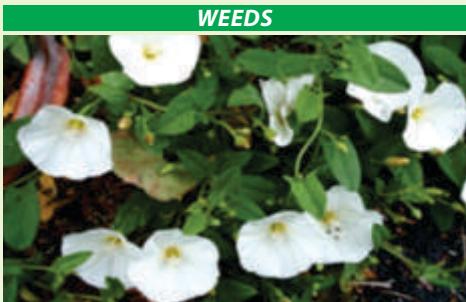
Nematode



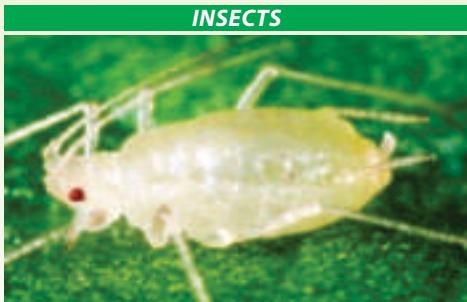
POTATO

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Germination Stage (0-20 days)	Soil Health	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre OR Sriculan Gold@ 5-8 kg/Acre	Broad casting
			Acer@2-2.5gm/kg Seed, Savera@7-8 ML/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite & White Grub	Spine@400 ml/Acre OR Rusban@400-450 ml/Acre Srigent GR@8-10 Kg/Acre.	With Irrigation
		Wilt	Acer@300-350 gm/Acre OR Remote Power@200-400 gm/Acre.	Foliar spray
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/Acre OR Trick@200-250 gm/Acre Penda Power@ 600-700 ml/Acre OR Fire@1000 ml/Acre (Non Crop Area).	Foliar spray
2	Window 2: Vegetative Growth phase (20-50 days)	White Fly Aphid, Jassid & Thrips	Indo Apache@250gm/Acre OR Prize@20-40 gm/acre OR Rogorus@270 ml/acre OR Dawn 2000@40-50 ml/Acre OR Dawn 7000@12-14 gm/Acre Sitara@40-80 gm/acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Empire@240gm/Acre OR Pradhan@800-1000g/Acre Sona Shree Gold @ 250gm/Acre OR Picaso Ultra@500-600 gm/Acre Indo Biogold@100-120 gm/Acre	Foliar spray (Twice in 15 days Interval)
3	Window 3: Tuber Initiation Stage (50-80 days)	Early & Late Blight	Shree M-45@600-800gm/acre OR Acer@500 gm/acre OR Figon@250-300 ml/acre OR Logic@100-200ml	Foliar spray
		Powdery Mildew	Fang@500 gm/acre OR Kargil N@750-1000gm/Acre Remote Power@200-400 gm/acre OR Refrey@240-280 ml/acre.	Foliar spray
		Mite	Abamite@150ml/Acre	Foliar spray
		White Grub	Spine@400 ml/Acre OR Srigent GR@8-10 kg/Acre.	With Irrigation
4	Window 4: Tuber Bulking to Maturity Stage (80-120 days)	Early & Late Blight, Aphid, Jassid & White Fly	If required repeat need basis spray suggested in window 2 & 3.	Foliar spray
		Plant stress condition & Bacterial Disease	Indo Biogold@100-120 gm/Acre OR Bactro Plus Gold@20-40 gm/acre.	

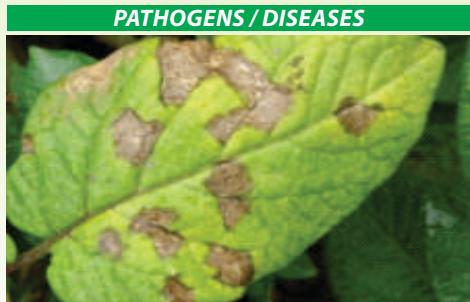
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Convolvulus arvensis



Aphid



Early blight



Cynodon dactylon



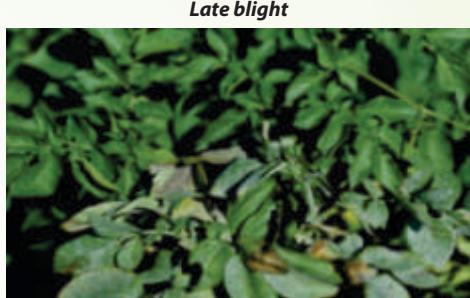
Armyworm



Late blight



White fly



Powdery Mildew



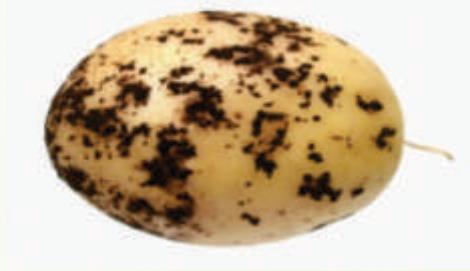
Echinochloa



White grub



Viral diseases



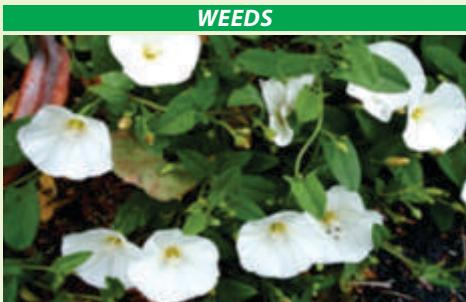
Black scurf



CHILLI

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery Seedling Stage (0-30 days)	Soil Health	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre.	Broad casting
		Seed Treatment	Acer@2-2.5gm/kg Seed, Savera@7-8 ml/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite	Spine @ 400 ml/Acre OR Rusban@400-450 ml/Acre	With Irrigation
		Root Rot & Wilt	Acer@300-350 gm/Acre OR Remote Power@200-400 gm/Acre OR Bactro Plus Gold@20-40 gm/Acre.	Foliar spray
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/Acre OR Trick@200-250 gm/Acre Penda Power@600-700 ml/Acre.	Foliar spray
2	Window 2: Transplanting to Seedling Establishment Stage (0-30 Days After Transplanting)	White Fly	Prize @ 20-40 gm/acre	
		Aphid, Jassid & Thrips	Dawn 7000@12-14 gm/acre OR Dawn 2000@ 40-50 ml/Acre OR Port@ 200 ml/acre OR Sitara@40-80 gm/acre.	Foliar spray
		Damping Off & Anthracnose	Remote Power@200-400 gm/Acre OR Buzzer@200-250ml/acre OR Acer@300-350gm/Acre	
		Nutrient Corrector & Vigour Enhancer	Indo Apache@250gm/Acre OR Picaso Gold@200-250 ml/Acre OR Sona Shree Gold@250 gm/Acre OR Gajab Ultra@200-250 ml/Acre OR Empire@240gm/Acre.	Foliar spray (Twice in 15 days Interval)
3	Window 3: Vegetative Growth Stage (30-50 Days After Transplanting)	Tobacco Caterpillar	Indogen@60ml/Acre Dominator@80-100 gm/Acre OR Corsa@400-600 ml/Acre OR Baton@200-250 ml/Acre OR Spiderman@160ml/Acre	Foliar spray
		Mite Nutrient Corrector & Vigour Enhancer	Abamite@150ml/Acre Repeat need basis spray suggested in window 2.	Foliar spray
4	Window 4: Flowering to Fruit Initiation Stage (50-70 Days After Transplanting)	Aphid, Jassid, White Fly & Thrips Leaf Spot, Bacterial Leaf Blight, Powdery Mildew & Fruit Rot	Repeat need basis spray suggested in window 2. Fang@500 gm/Acre OR Acer@300-350 gm/Acre OR Refery@240-280 ml/Acre OR Tango Super@200 ml/Acre Remote Power@200-400 gm/Acre.	
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 2.	Foliar spray
5	Window 5: Fruit Maturity Stage (70-90 DAT)	Fruit Borer & Tobacco Caterpillar	Dominator@80-100 gm/Acre OR Planogulf@60 ml/Acre OR Corsa@400-600 ml/Acre OR Baton 200-250 ml/acre OR Farrate@80-120ml/Acre.	Foliar spray

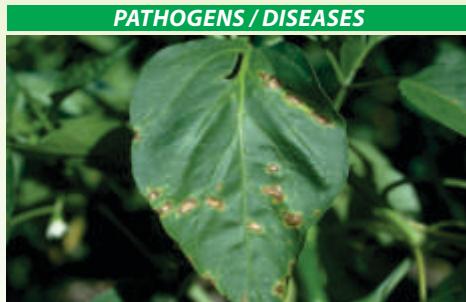
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Dactyloctenium aegyptium



Thrips



Bacterial leaf spot



Cynodon dactylon



Aphid



Damping off



Fruit borer



Wilt



Echinochloa crusgalli



Tobacco caterpillar



Anthracnose



COLE CROP

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery Seedling Stage (0-30 days)	Soil Health	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre OR Sriculan Gold@ 5-8 kg/Acre.	Broad casting
		Seed Treatment	Acer@2-2.5gm/kg Seed, Savera@7-8 ML/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite	Spine@400 ml/Acre OR Srigent GR@7.5-10 Kg/Acre Jabar@ 50 gm/Acre	With Irrigation
		Damping Off	Acer@300-350gm/Acre	Foliar spray
2	Window 2: Transplanting to Seedling Establishment Stage (0-30 Days After Transplanting)	Aphid, Jassid & Thrips	Dawn 7000 @12-14 gm/acre OR Dawn 2000@ 40-50 ml/Acre OR Sitara@40-80 gm/acre.	Foliar spray
		Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/Acre OR Trick@100-120 gm/Acre OR Penda Power@600-700 ml/Acre.	
3	Window 3: Vegetative Growth Stage (30-50 Days After Transplanting)	Tobacco Caterpillar	Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Planogulf@60ml/Acre OR Baton@ 200-250 ml/acre OR Farrate@80-120 ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Indo Apache@250gm/Acre Empire@240gm/Acre OR Picaso Gold@200-250 ml/Acre OR Bio Gold/Jaadu@100-120 gm/Acre.	Foliar spray (Twice in 15 days Interval)
		Aphid, Jassid & Thrips	Sitara@40-80 gm/acre Dawn 2000@40-50 ml/Acre OR Dawn 7000@12-14 ml/Acre.	
		Mite	Spiderman@160ml/Acre	Foliar spray
4	Window 4: Flowering to Fruit Initiation Stage (50-70 Days After Transplanting)	Downey Mildew, Black Rot, Soft Rot & Bacterial Disease	Indogen@20ml/Acre OR Fang@500 gm/Acre OR Remote Power@200-400gm/Acre OR Bactro Plus Gold@20-40 gm/Acre	Foliar spray
		Diamond Back Moth & Butter Fly	Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Plano Gulf@60ml/Acre Baton@200-250 ml/acre OR Farrate@80-120 ml/Acre.	
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@200-250 gm/Acre OR Sona Shree 33 @200 gm/Acre OR Empire@240 gm/Acre.	
5	Window 5: Curd Maturity Stage (70-85 DAT)	Cauliflower & Cabbage Worm	Indogen@20ml/Acre OR Dominator@80-100 gm/Acre OR Corsa@400-600 ml/Acre OR Baton200-250 ml/Acre Planogulf@60 ml/Acre.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Dactyloctenium Aegyptium



Worm Butterfly



Bacterial Soft Rot



Echinochloa crusgalli



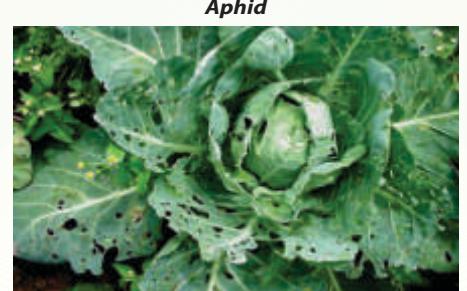
Aphid



Downey mildew



Cynodon dactylon



Diamond Back Moth



Black rot



Sorghum halepense



Back moth caterpillar



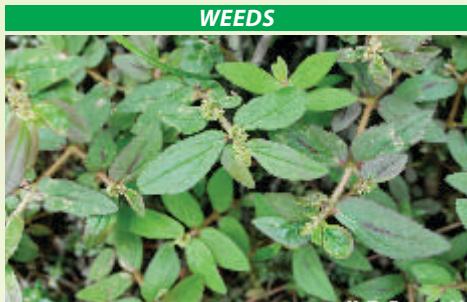
Spodoptera



ONION

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery Seedling Stage (0-50 days)	Soil Health	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus@5-10kg/acre OR Sriculan Gold@ 5-8 kg/Acre.	Broad casting
		Seed Treatment	Acer@2-2.5gm/kg Seed, Savera@7-8 Ml/kg Seed, Indo Biogold@2-5 gm/kg Seed	Dry application
		Termite	Spine@400 ml/Acre OR Srigent GR@7.5-10 Kg/Acre Jabar@ 50 gm/Acre	With Irrigation
		Damping Off	Acer@300-350gm/Acre OR Refery@240-280g/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Indo Apache@500gm/Acre OR Picaso Gold@200-250 ml/Acre OR Empire@240g/Acre Indo Biogold/Jaadu@100-120 gm/Acre OR Gajab Ultra@200-250 ml/Acre.	Foliar spray/ Broad casting
2	Window 2: Transplanting to Seedling Establishment Stage (0-30 Days After Transplanting)	Weeds (BLWs, Sedges and Grasses)	Penda Shree@1000-1200 ml/Acre OR Oxytech@150-200 ml/Acre OR Hotshot-300ml/Acre Penda Power@600-700 ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@150-200 ml/Acre OR Empire@240g/Acre Indo Biogold/Jaadu@100-120 gm/Acre OR Gajab Ultra@70-80 ml/Acre.	
3	Window 3: Ten to Twelve True Leaves to Bulb Initiation Stage (30-60 Days After Transplanting)	Thrips & Maggots	Dawn2000@40-50 ml/Acre OR Sitara@40-80gm/Acre	Foliar spray
		Weeds (BLWs, Sedges and Grasses)	Dawn 7000@12-14 gm/Acre Oxytech@150-200 ml/Acre	
		Purple Blotch & Downy Mildew	Refery@240-280 ml/Acre OR Acer@300-350 gm/Acre Tango Super@200 ml/Acre OR Buzzer@200-250 ml/Acre Remote Power@200-400 gm/Acre.	
4	Window 4: Bulb Diameter 2.5-4.0 cm (60-80 DAT) to Bulb Diameter >7.5 cm (80-100 Days After Transplanting)	Purple Blotch & Downy Mildew	Refery@240-280 ml/Acre OR Tango Super@200 ml/Acre OR Buzzer@200-250 ml/Acre OR Remote Power@200-400 gm/Acre.	Foliar spray
		White Grub, Cutworm & Spodoptera	Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Planogulf@60ml/Acre Baton @200-250 ml/acre OR Farrate@80-120 ml/Acre.	
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 2.	
5	Window 5: Bulb Maturity Stage (100-120 DAT)	Thrips & Maggots	Dawn 2000@40-50 ml/Acre OR Dawn 7000@12-14 gm/Acre Sitara@40-80gm/Acre	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Euphorbia geniculata



Thrips



Yellow spot



Cyanotis axillaris



White grub



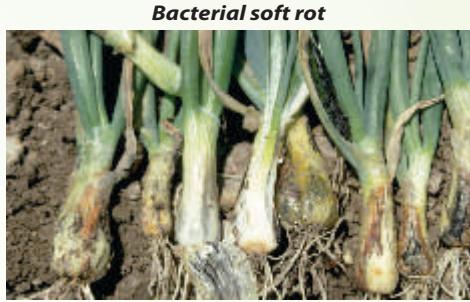
Bacterial soft rot



Cynodon dactylon



Seed and Root maggot



Damping off



Sorghum halepense



Thrips damage



Purple blotch



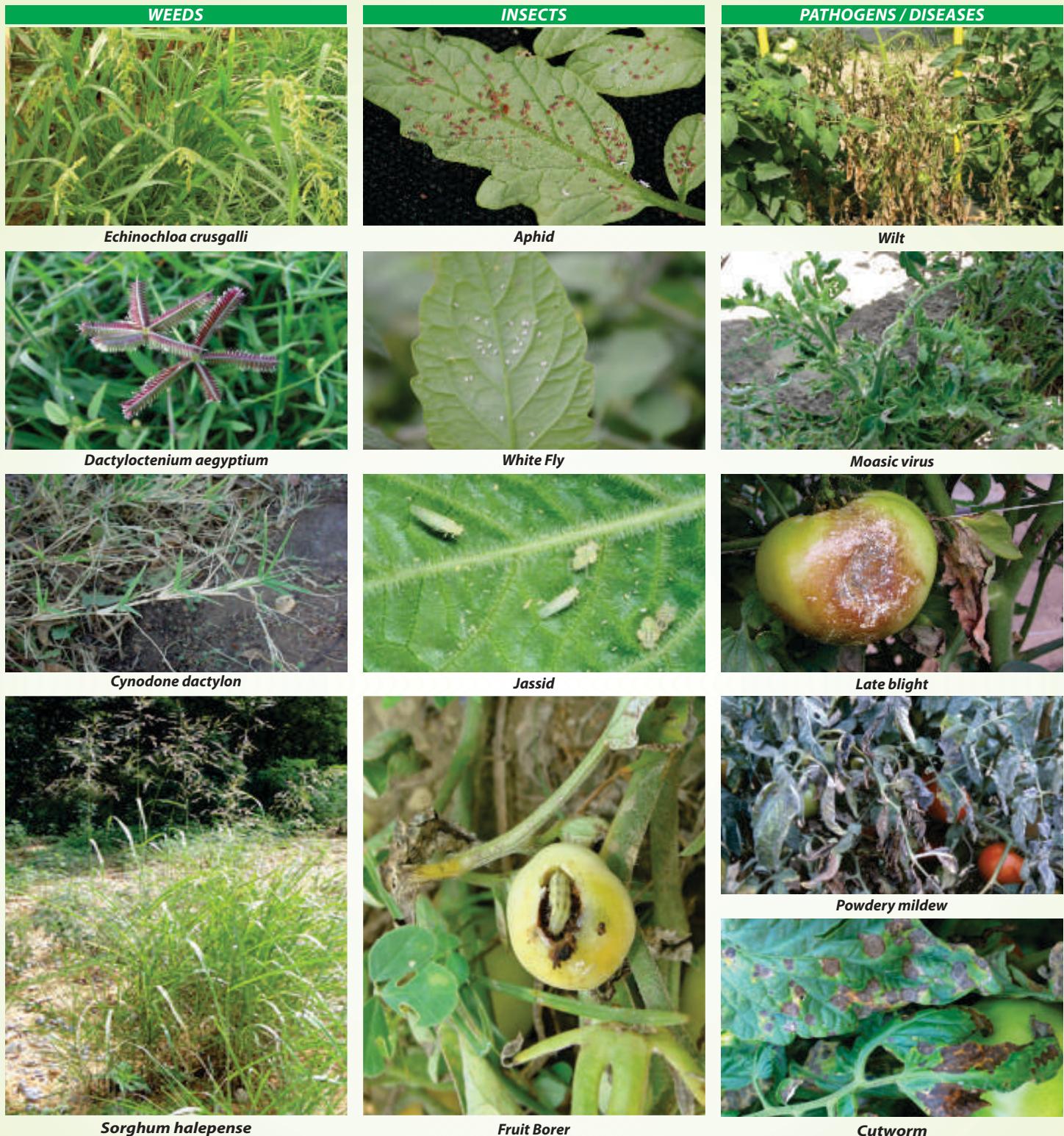
Cutworm



TOMATO

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery Seedling Stage (0-40 days)	Soil Health Seed Treatment Termite Nematode Damping Off Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus @5-10kg/acre OR Sriculan Gold@ 5-8 kg/Acre. Acer@2-2.5gm/kg Seed, Savera@7-8 Ml/kg Seed, Indo Biogold@2-5 gm/kg Seed Spine@400 ml/Acre OR Srigent GR@7.5-10 Kg/Acre Jabar@ 50 gm/Acre. Furarus@7.5-10kg/Acre Remote Power@ 200-400 gm/Acre OR Buzzer@200-250 gm/acre OR Acer@300-350gm/Acre Tango Super@200 ml/acre. Penda Shree@1000-1200 ml/Acre OR Trick@100gm/Acre OR Penda Power@600-700 ml/Acre.	Broad casting Dry application With Irrigation Broad casting Foliar spray Foliar spray
2	Window 2: Transplanting to Seedling Establishment Stage (0-30 Days After Transplanting)	White Fly, Aphid, Jassid & Thrips Root Rot, Wilt, Anthracnose & Early Blight	Port@200 ml/acre OR Prize@20-40 gm/Acre Dawn 7000@12-14 gm/Acre OR Dawn 2000@40-50 ml/Acre OR Sitara@40-80 gm/Acre OR Spiderman@240ml/Acre Acer@300-350 gm/Acre OR Figon@200-300 ml/Acre. OR Remote Power@200-400 gm/Acre OR Bactro Plus Gold@20-40 gm/Acre OR Tango Super@200 ml/Acre OR Buzzer@200-250 gm/Acre.	Foliar spray
3	Window 3: Vegetative Growth Stage (30-50 Days After Transplanting)	Tobacco Caterpillar Powdery Mildew & Bacterial Leaf Spot Nutrient Corrector & Vigour Enhancer	Dominator@80-100 gm/acre OR Corsa @ 400-600 ml/acre OR Planogulf@60ml/Acre Baton@200-250 ml/acre. Kargill WDG@750-1000 gm/Acre OR Buzzer@200-250 gm/Acre Kargill N@750-1000 gm/Acre OR Remote Power@200-400 gm/Acre. Empire@240gm/Acre OR Picaso Gold@150-200 ml/Acre OR Gajab Ultra@70-80 ml/Acre OR Green Valley@1.5-3 ltr / Acre	Foliar spray Foliar spray Foliar spray (Twice in 15 days Interval)
4	Window 4: Flowering to Fruit Initiation Stage (50-70 Days After Transplanting)	Aphid, Jassid, White Fly & Thrips Leaf Spot, Bacterial Leaf Blight, Late Blight & Fruit Rot Mite	Repeat need basis spray suggested in window 2. Fang@500 gm/Acre OR Acer@300-350gm/Acre OR Logic@100-200 ml/Acre OR Tango Super@200 ml/Acre Remote Power@200-400 gm/Acre OR Bactro Plus Gold@20-40 gm/Acre. Spiderman@125ml/Acre	Foliar spray
5	Window 5: Fruit Maturity Stage (70-100 DAT)	Fruit Borer & Tobacco Caterpillar	Dominator@80-100 gm/Acre OR Planogulf@60ml/Acre OR Corsa@400-600 ml/Acre OR Baton@200-250 ml/acre.	Foliar spray

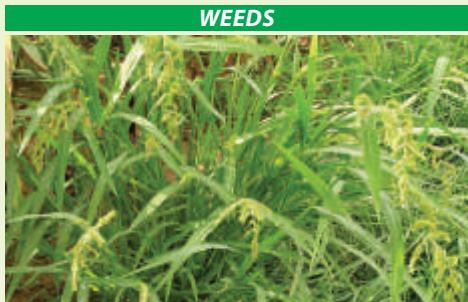
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



BRINJAL

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Nursery Seedling Stage (0-35 days)	Soil Health Seed Treatment Termite Nematode Damping Off	Root-o-Max Gold@8-12kg /acre OR Indo Mycorrhiza @8-12 kg/acre OR ROMU@4-6 kg./acre OR Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus @5-10kg/acre OR Sona Shree Gold@ 500 gm/Acre. Acer@2-2.5 gm/kg Seed, Savera@7-8 ml/kg Seed, Indo Biogold@2-5 gm/kg Seed Spine@400 ml/Acre OR Srigent GR@7.5-10 Kg/Acre Furarus@7.5-10kg/Acre Remote Power@ 200-400 gm/Acre OR Buzzer@200-250 gm/acre OR Acer@300-350gm/Acre Tango Super@200 ml/acre.	Broad casting Dry application With Irrigation Broad casting Foliar spray
2	Window 2: Transplanting to Vegetative Growth Stage (0-50 Days After Transplanting)	White Fly, Aphid, Jassid & Thrips Bacterial Blight & Leaf Spot Weeds (BLWs, Sedges and Grasses)	Port @ 200 ml/acre OR Prize@20-40 gm/acre Dawn 7000@ 12-14 gm/acre OR Dawn 2000@ 40-50 ml/Acre OR Sitara@40-80 gm/acre. Buzzer@200-250 gm/acre OR Tango Super@200 ml/acre OR Refery@240-280 ml/acre OR Bactro Plus Gold@ 20-40 gm/acre. Penda Shree@1000-1200 ml/Acre OR Penda Power@600-700 ml/Acre OR	Foliar spray
3	Window 3: Grand Vegetative Growth Stage (50-70 Days After Transplanting)	Shoot Borer & Spotted Borer Mite Nutrient Corrector & Vigour Enhancer White Fly, Aphid, Jassid & Thrips	Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Planogulf@60ml/Acre OR Baton@200-250ml/acre OR Farrate@120-150ml/Acre Spiderman@160ml/Acre Empire@240gm/Acre OR Biogold/Jaadu@100-120gm/Acre OR Picasso Gold@150-200ml/Acre OR Pradhan@800-1000 gm/Acre OR Gajab Ultra@70-80 ml/Acre OR Sona S 33@250g/Acre Repeat need basis spray suggested in window 2.	Foliar spray Foliar spray Foliar spray (Twice in 15 days Interval) Foliar spray
4	Window 4: Flowering to Fruit Initiation Stage (70-90 Days After Transplanting)	Shoot Borer & Fruit Borer Collar Rot & Bacterial Disease	Repeat need basis spray suggested in window 3. Tango Super@200 ml/Acre Remote Power@200-400 gm/Acre OR Bactro Plus Gold@20-40 gm/Acre.	Foliar spray
5	Window 5: Fruit Maturity Stage (90-120 DAT)	Fruit & Shoot Borer Phomosis	Repeat need basis spray suggested in window 3. Acer@300-350 gm/acre OR Tango Super@200 ml/acre.	Foliar spray

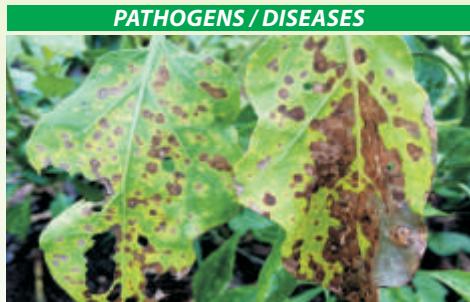
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Echinochloa crusgalli



Stem Borer



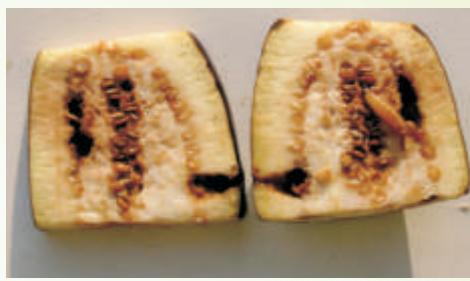
Leaf spot



Dactyloctenium aegyptium



Mite



Brinjal fruit borer



Cynodon dactylon



Aphid



Damping off



Sorghum halepense



Spotted beetle



Collar rot



Jassid



PULSES

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Window 1: Field Preparation to Seed Establishment (0-30 days)	Soil Health Seed Treatment Termite & White Grub Nematode Weeds (BLWs, Sedges and Grasses)	Root-o-Max Gold@4-6kg /acre OR Indo Mycorrhiza @4-6 kg/acre OR ROMU@3.5kg./acre & Zinc Super Gold@5-8 kg/acre OR Zinc Super Plus @5-10kg/acre. Acer@2-2.5gm/kg Seed, Savera @7-8 ml/kg Seed, Indo Biogold@2-5 gm/kg Seed Spine@400 ml/Acre OR Srigent GR@8-10Kg/Acre Furarus@7.5-10 kg/Acre. Penda Shree@1000-1200ml/Acre OR Penda Power@600-700 ml/Acre OR Shaktiban@300-400 ml/Acre OR Arjun-32@1000-1200ml/acre.	Broad casting Dry application With Irrigation Foliar spray
2	Window 2: Vegetative growth to Flowering stage (30-50 days)	White Fly, Jassid, Aphid & Thrips Pod Borer Nutrient Corrector & Vigour Enhancer Root Rot	Rogorus@250-400 ml/Acre OR Dawn 2000@40-50 ml/acre OR Sitara@40 gm/acre OR Port@200 ml/Acre Prize@20-40 gm/Acre. Dominator@80-100 gm/Acre OR Corsa@400-600 ml/acre OR Baton@200-250ml/Acre Planogulf@60 ml/Acre OR Farrate@80-120ml/Acre. Biogold@100-120g/Acre OR Pradhan@ 800-1000 gm/Acre OR Sonashree 33@250g/Acre Empire@240g/Acre OR Gajab Ultra@70-80ml/Acre Remote Power@300 gm/acre OR Tango Super@200 ml/acre OR Bactro Gold@20-40 gm/acre	Foliar spray Foliar spray Foliar spray repeat at 15 days interval Foliar spray
3	Window 3: Begining Pod to Seed Formation stage (50-70 days)	Bollworms (Pod Borer & Stem Borer) Alternaria & Cercospora Leaf Spot Nutrient Corrector & Vigour Enhancer Plant stress condition & Bacterial Disease	Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Plano Gulf@60 ml/acre OR Farrate@80-120 ml/Acre. Baton@200-250 ml/acre. Fang@500 gm/acre OR Acer@200-250 gm/acre OR Tango Super@200 ml/acre OR Remote Power@300 gm/acre. Repeat need basis suggested in window 2.	Foliar spray
4	Window 4: Pod Maturity Stage (>70 days)	Jassid, Aphid, Pod Borer, Leaf Spot, Powdery Mildew & Anthracnose. Mite	Indo Biogold@100-120 gm/Acre. Bactro Plus Gold@20-40 gm/acre OR Repeat need basis spray suggested in window 2 & 3.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Trianthema portulacastrum



Jassid



Cercospora leaf spot



Chloris barbata



Aphid



Powdery mildew



Amaranthus viridis



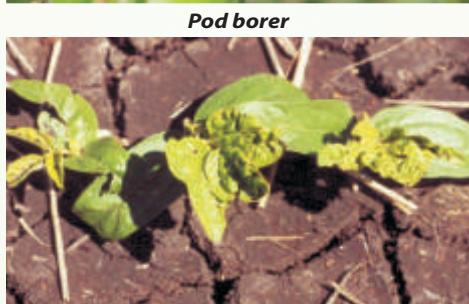
Pod borer



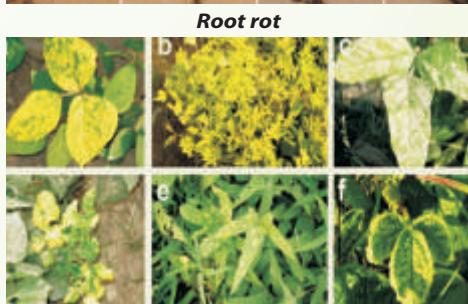
Root rot



Cyperus rotundus



Thrip



Yellow mosaic virus



MANGO

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Before Flowering (December January Month)	Termite Mealy Bug Webber /Mite Nutrient Corrector & Vigour Enhancer	Spine@400ml/acre OR SriculanGR@100-150gm/tree Rusban@1500-2000 ml/Acre. Dawn 7000@3-4 gm/15 Ltr. Water OR Dawn 2000@5-6 ml/15 Ltr. Water. Farrate@0.5-1 ml/Ltr Picaso Gold@150-200 ml/Acre OR ROMU@100-200g/tree Indo Biogold/Jaadu @100-120 gm/Acre OR Sriculan Gold@5-8kg/acre OR Empire@240g/Acre OR Jagromin 99@250-400 ml/Acre OR	Foliar spray Foliar spray Foliar spray Foliar spray (Twice in 15 days Interval)
2	Flowering Time (before 15 February)	Mango Hopper Nutrient Corrector & Vigour Enhancer	Dawn 2000@2-4 ml/tree OR Sitara@40 gm/Acre OR Rogorus@1000-1350 ml/Acre OR Blunt@1-2ml/Ltr OR Jabar@50gm/Acre Repeat need basis spray suggested in window 1.	Foliar spray
3	After Flowering (After 15 February)	Powdary Mildew & Malformation Nutrient Corrector & Vigour Enhancer	Nector Plus@1ml/ltr. water OR Kargill DF@750-1000 gm/Acre OR Bactro Plus Gold@20-40 gm/100 Ltr. water OR Refery@2-3 ml/ltr. water OR Tango Super@2 ml/ltr. water. Picaso Gold@150-200 ml/Acre OR Empire@240 gm/Acre OR Gajab Ultra@70-80ml/Acre Indo Biogold@100-120 gm/Acre OR Pradhan@800-1000 gm/Acre OR Jagromin 99@250-400 ml/acre.	Foliar spray
4	Fruit Setting Stage (before 15 March)	Powdary Mildew & Malformation Anthracnose Nutrient Corrector & Vigour Enhancer	Nector Plus@1ml/ltr. water OR Figon@2-3 ml/ltr. water OR Kargil DF@750-1000 gm/Acre. Tango Super@2 ml/L.water OR Srizole@2-2.5ml/ltr water OR Refery@1 ml/ltr. water OR Acer@1.5 ml/ltr water OR Logic@100-200 ml/Acre. Repeat need basis spray suggested in window 3.	Foliar spray
5	Fruit Setting Stage (15 March to 15 April)	Downy Mildew Leaf Feeder & Mealy Bug Nutrient Corrector & Vigour Enhancer	Shree M 45@600-800 gm/acre. Dominator@80-100 gm/acre OR Corsa@400-600 ml/acre OR Baton@200-250 ml/acre OR Farrate@0.5-1ml/ltr water OR Planogulf@60ml/Acre. Repeat need basis spray suggested in window 3.	Foliar spray
6	Fruit Setting Stage (After 15 April)	Gall Midge & Fruit Fly Nutrient Corrector & Vigour Enhancer	Dawn 7000@12-14 gm/acre OR Planogulf@60ml/Acre OR Savera@40-50 gm/Acre. Picaso Gold@150-200 ml/Acre OR Empire@240 gm/Acre OR Gajab Ultra@70-80ml/Acre Indo Biogold/Jaadu@100-120 gm/Acre OR Pradhan@800-1000 gm/Acre OR Jagromin 99@250-400 ml/acre.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Die Back



Mango malformation



Gall midge



Mealy bug



Anthracnose



Powdery mildew



Mite



Anthracnose on fruit



Mango hopper



APPLE

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Before Flowering (Greentip Stage)	Termite	Spine@400ml/acre OR SriculanGr@100-150gm/plant Rusban@1500-2000 ml/Acre.	Foliar spray
		Mealy Bug	Dawn 7000@12-14 gm/acre OR Dawn 2000@40-50ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@150-200 ml/Acre OR Indo Breeza@100 gm/Acre OR Indo Biogold @100-120 gm/Acre OR Picaso Gold@150-200 ml/Acre OR Jagromin 99@250-400 ml/Acre.	Foliar spray (Twice in 15 days Interval)
2	Flowering Time (Pink Tip Stage to Petal Fall Stage)	Sanjose Scale, Mite & Aphis	Dawn 2000@2-4 ml/tree OR Sitara@40 gm/Acre OR Rogorus@600-800 ml/Acre OR	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Spiderman@3ml/ltr water Repeat need basis spray suggested in window 1.	
3	After Flowering (Petal Fall to Fruit Setting Stage)	Sanjose Scale, Mite & Aphid	Dawn 2000@2-4 ml/tree OR Sitara@40 gm/Acre OR Rogorus@1000-1350 ml/Acre OR Alishan Super@100-120 ml/Acre Nector Plus@1ml/ltr. water OR Figon@2-3 ml/ltr. water OR Kargil DF@750-1000 gm/Acre OR Captan@1000 gm/Acre.	Foliar spray
		Scab & Leaf Spot	Picaso Gold@150-200 ml/Acre OR Green Valley@2.5-3ltr/Acre OR Empire@240 gm/Acre OR Gajab Ultra@70-80ml/Acre Indo Biogold@100-120 gm/Acre OR Pradhan@800-1000 gm/Acre OR Jagromin 99@250-400 ml/acre OR	
		Nutrient Corrector & Vigour Enhancer		
4	Fruit Setting Stage (Fruit Development Stage I-III)	Scab, Leaf Spot & Anthracnose	Nector Plus@1ml/ltr. water OR Tango Super@200ml/Acre Figon@2-3 ml/ltr. water OR Acer@1.5 ml/ltr water Buzzer@15 ml/100 ltr water OR Captan@1000 gm/Acre Indogulf Z-80@400-600gm/Acre OR Shree M-45@600-800 gm/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 3.	
5	Fruit Setting Stage (Fruit Development Stage IV)	Scab, Leaf Spot, Anthracnose & Powdery Mildew	Repeat need basis spray suggested in window 4.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 3.	
6	Fruit Maturity Stage	Sanjose Scale, Mite & Aphis	Dawn 2000@2-4 ml/tree OR Sitara@40 gm/Acre OR Rogorus@600-800 ml/Acre OR Alishan Super@100-120 ml/Acre OR Jabar@ 50 gm/Acre OR Rusban@1500-2000ml/Acre	Foliar spray
		Scab, Leaf Spot, Anthracnose & Powdery Mildew	Repeat need basis spray suggested in window 4.	

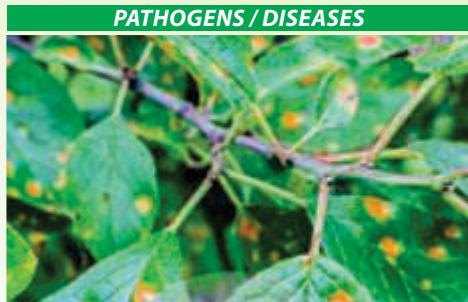
Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Trianthema portulacastrum



Apple Codling Moth



Chloris barbata



Apple Flea beetle



Bacterial leaf spot



Amaranthus viridis



Wooly apple Aphis



Apple scab



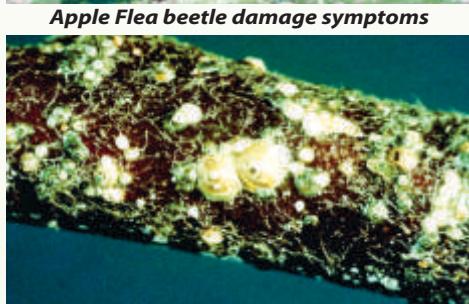
Cyperus rotundus



Apple Flea beetle damage symptoms



Apple rust



San-jose Scale



Black rot



GRAPE VINE

S.No.	Crop Stage	Insect/Diseases	Product Recommendation	Application Methods
1	Before Flowering	Termite	Spine@400ml/acre OR SriculanGr@100-150gm/plant Rusban@1500-2000 ml/Acre.	Foliar spray
		Mealy Bug	Dawn 7000@12-14 gm/acre OR Dawn 2000@40-50ml/Acre OR Rusban@1500-2000 ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Zinc Super Gold@5-8Kg/Acre OR Bloom Flower Gold@1-2 Kg/Acre OR ROMG@8-12 Kg/Acre OR ROMU@4-6 Kg/Acre OR Indo Mycorrhiza@50-200 gm/tree.	Soil Application
2	Flowering Stage	Hopper, Thrips, Mite & Leaf Folder	Dawn 2000@2-4 ml/tree OR Sitara@40 gm/Acre OR Rogorus@600-800 ml/Acre OR	
		Blight, Bacterial Leaf Spot, Bitter Rot, Powdery Mildew & Anthracnose	Nector Plus@200-400ml/Acre OR Tango Super@200ml/Acre OR Figon@2-3 ml/ltr. water OR Acer@1.5 ml/ltr water Buzzer@15 ml/100 ltr water OR Captan@1000 gm/Acre. Fang@500 gm/Acre OR Remote Power@300g/Acre OR Shree M-45@600-800 gm/Acre	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Picaso Gold@150-200 ml/Acre OR Picaso Power@150-200 gm/Acre OR Gajab Ultra@70-80ml/Acre OR Indo Biogold@100-120 gm/Acre OR Pradhan@800-1000 gm/Acre.	
3	Fruit Setting Stage (Fruit Development Stage)	Blight Leaf Spot, Anthracnose & Powdery Mildew	Nector Plus@200-400ml/Acre OR Refery@1ml/ltr water Figon@2-3 ml/ltr water OR Acer@1.5 ml/ltr water Buzzer@15 ml/100 ltr water OR Kargill N@750-1000g/Acre OR Shree M-45@600-800 gm/Acre	
		Stem Borer, Girdle Beetle & Chafer Beetle	Dominator@80-100 gm/Acre OR Corsa@400-600ml/Acre Planogulf@60 ml/Acre OR Baton@200-250ml/Acre.	Foliar spray
		Nutrient Corrector & Vigour Enhancer	Repeat need basis spray suggested in window 2.	
4	Fruit Maturity Stage	Hopper, Thrips, Mite & Leaf Folder	Repeat need basis spray suggested in window 2.	
		Blight, Bacterial Leaf Spot, Bitter Rot, Powdery Mildew & Anthracnose	Repeat need basis spray suggested in window 2.	
		Fruit Rot & Bitter Rot	Tango Super@200ml/Acre OR Remote Power@300g/Acre OR Bactro Plus Gold@20-40 gm/Acre.	Foliar spray

Use Ankur Gold @ 5ml / 15 ltr. with every spray solution for Increasing effectiveness of the agro chemical



Trianthema portulacastrum



Grape vine beetle



Leaf spot



Chloris barbata



Grape mealy bug



Red Blotch disease of grape vine



Amaranthus viridis



Grape vine aphid



Anthracnose of grapevine



Cyperus rotundus



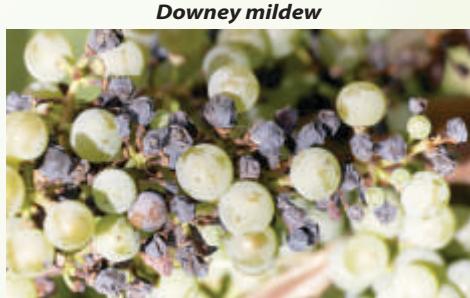
White fly



Downy mildew



Grape vine scale insects



Black rot



Early shoot borer (*Chilo infuscatellus*)

Dead heart



Bore holes



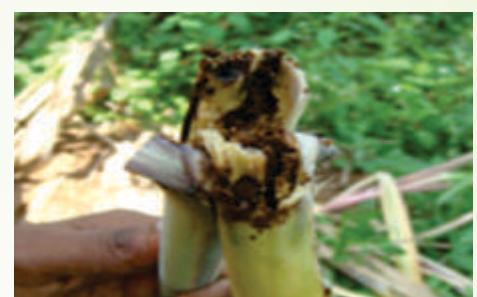
Rotten portion

Internode borer (*Chilo sacchiraphagus*)

Shortened internode



Bore hole with excreta



Frass on affected portion

Top Shoot borer (*Scirpophaga excerptalis*)

Bore hole



Parallel shot hole



Bunchy top appearance

Whiteflies (*Aleurolobus barodensis*)

Yellowing of leaves



Pinkish or purple leaves



White and Black dots

White grub (*Holotrichia consanguinea*)

Yellowing of leaves



Drying of entire crown



Affected canes



Affected roots

Termite (*Odontotermes obesus*)



Semi circular feeding



Drying of leaves



Setts filled with soil

Mealy bug, *Saccharicoccus sacchari*



Insects beneath leaf sheath



Sooty mould



Irregular yellowing of leaves



Dark encrustation

Grass hoppers, *Hieroglyphus banyan*



Feeding from margin of leaf blade



Left midrib after feeding



Poor germination



Shrivelling of canes



Drying of canes

COTTON INSECT - PESTS DAMAGE SYMPTOMS

Fruit borer/ American Boll worm (*Helicoverpa armigera*)



Feeding injury



Circular bore hole

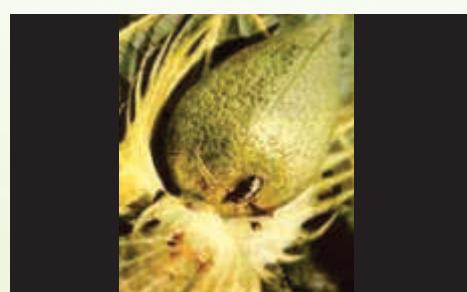


Damaged boll

Spotted boll worm (*Earias insulana*)



Drying terminal shoots



Bore holes and rotting



Flared square



Mealy bug attacked on stem



infested plant by mealy bug



Spodoptera litura damage leaves

Leaf Roller *Sylepta derogata*



Rolled leaves



Feeding on leaves

Whitefly



Thrips



PADDY INSECT - PESTS DAMAGE SYMPTOMS

Paddy stem borer (*Scirpophaga incertullas*)



Dead heart

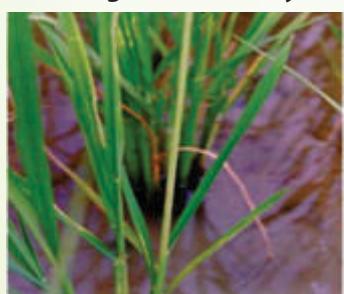


White ears



White and dried leaves

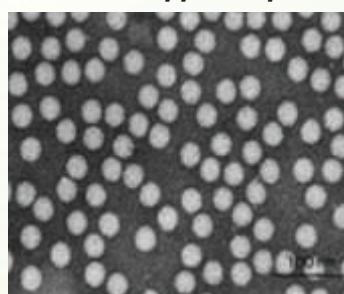
Gall midge: *Orseolia oryzae*



Tuber gall



Adult feeding

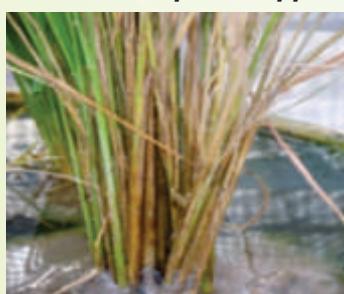


Virus particle under electron microscope



RTV-damage

White backed plant hopper: *Sogatella furcifera*



Completely De-sapped plant



Circular dry patches in field



Adult feeding on grains

Thrips: *Stenchaetothrips biformis*



Initial- inward rolling of leaves

Brown plant leafhopper: *Nilaparvata lugens*



Hopper burn

Mealybug: *Brevennia rehi*



Symptoms of mealy bug infestation



Mealy bug infested plant

BRINJAL INSECT - PESTS DAMAGE SYMPTOMS

Fruit and shoot borer (Leucinoides orbanalis) damaged plant symptoms



Hadda / spotted beetle: *H.vigintioito punctate*



Skeletonized-Grub damage

Brown leaf hopper: *Cestius phycitis*



Little leaf of brinjal



Ash weevils: *Myllocerus subfasciatus*, *M. discolor*, *M. viridanus*



Symptoms

V- shape notching

TOMATO INSECT - PESTS DAMAGE SYMPTOMS

Fruit borer (*Harmigera*)

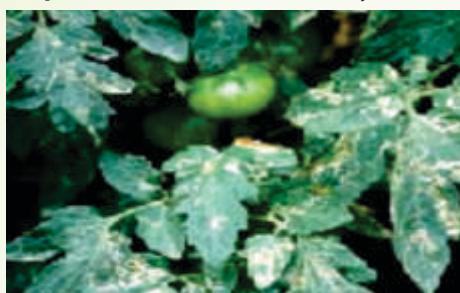


Larval damage fruit



Adult damage fruit

Serpentine leaf miner: *Liriomyza trifolii*



Leaf mining damage



Dried leaves



Serpentine leaf minor

Leaf eating caterpillar: *Spodoptera litura*



Larval feeding



Scrubbing



Foliage feeding



Flower damage

Whitefly: *Bemisia tabaci*



Fruit damage



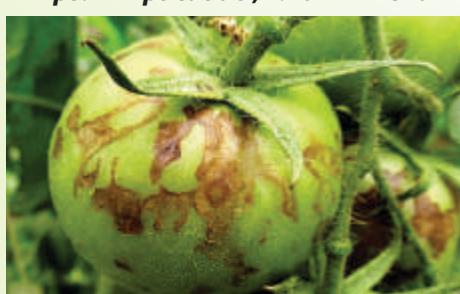
Silvery damage



Tomato leaf curl



Thrips: *Thrips tabaci, F. rankliniella*



Red spider mite: *Tetranychus spp*



Pin worm; *Tuta absoluta*



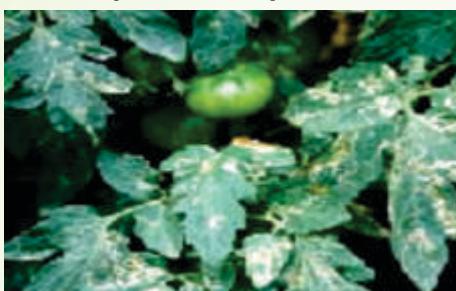
Pin hole in fruit



Symptoms

CHILLI INSECT - PESTS DAMAGE SYMPTOMS

Chilli thrips: *Scirtothrips dorsalis*



Green peach aphid: *Myzus persicae*



Chilli thrips infestation: Upward curling



Green peach aphid infestation - Crinkling

Yellow mite or muranai mite: *Polyphagotarsonemus latus*



Yellow mite infestation - downward curling of leaves

Chilli Borer (*Helicoverpa armigera*)



Bore hole



Infested plant of chilli

INDO MYCHORIZA

New Generation Microbial Fertiliser..

Now unleash the Power of Roots

What is Indo Mychoriza?

- * New generation Bio-fertilizer having a number of species of mycorrhizae (fungi that associate with roots)
- * It enables plants to enhance nutrient and water uptake better than the normal roots.
- * On application to the crop, it gets associated with the roots of the plants, establishes inside the root hairs and send out thin and long mycelia in the soil.



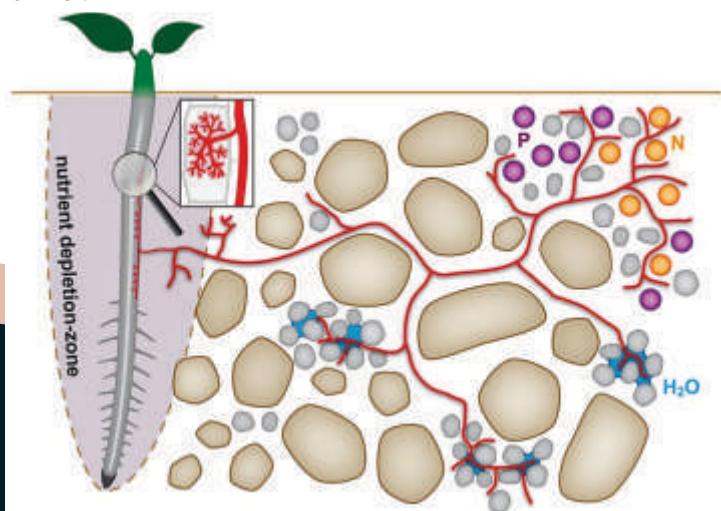
Advantages

- Crop absorbs more of nutrients and water from the surroundings and hence they become healthier and grow faster
- It helps the plants to get maximum benefits of phosphatic fertilizers
- It protects the plants from Nematodes and Soil Borne diseases.

Benefits

- Rapid crop growth with better tillering or branching
- Better flowering and fruiting
- Better quality of the produce

Thus Indo Mychoriza helps in increasing the profit of the farmer.



How is Indo Mychoriza different from others?

- Indo Mychoriza is a research based product having right mix of several endo and ecto Mychorrhizal species.
- It is effective in all agro-climatic conditions and in many crops
- It has additional nutrients such as
 - Sea weed extract
 - Humic acid
 - Other naturally derived Ingredients

Therefore it acts as a potent growth enhancer, soil conditioner and yield multiplier.

Use and Dosage:

We recommend use of Indo Mychoriza at the time of basal dressing of fertilizer.

Alternatively, it can be applied upto 30 Days after sowing / transplanting.

Crop	Dosage
Field Crops Wheat, Paddy, Pulses, Oil Seeds	4 kg/acre
Vegetables	8 kg/acre
Potato/Sugarcane/ Commercial Crops/ Flowers	8-12 kg/acre
Orchards	50-200



Ministry of Micro, Small and Medium Enterprises,
Government of India
MSME
MICRO, SMALL & MEDIUM ENTERPRISES
99999 44 4444
First Prize Winner
NATIONAL
AWARD-2013

Premium Sea Weed Based Plant Health Product

Indo Breeza is 100% natural water-soluble and is in the form of noodles. It is formulated from soluble black Seaweed extract derived from vegetative kelp Seaweed. It contains a sufficient amount of oceanic bio-active matter and other molecules such as Phycocolloid, Mannitol, Oligose, Polyphenol, Trehalase, Cytokinin, Lignin etc which are essential for improving germination, root development, leaf quality, general plant vigor and resistance to pathogens. It also increases the flower set and fruit production.



Key Features:

- Unique formula based on Sea Weeds, Amino Acids, Carbohydrates, Fulvic and Humic Acid.
- Suitable for Early Growth, Flowering and Fruiting
- Correct Imbalance of Nutrients
- Fights Abiotic Stress
- Induces Disease Resistance in plants
- Helps in Higher Production & Better Quality

Recommendations:

Cereals, Millets, Pulses, Oilseeds, Fiber Crops, Sugar Cane, Forage Crops, Plantation Crops, Vegetables, Fruits, Spices, Flowers, Medicinal Crops, Aromatic Crops, Orchards and Ornamentals.

Product Usage and Dose

- Dose for Spraying is 200-250 gm per acre
- For Drip, Dose may be increased to 400 gm per acre
- For best results, we recommend spray During Early growth period. repeat spray may be done 20-25 days after first spray.



Picaso® ULTRA



Bumper Harvest

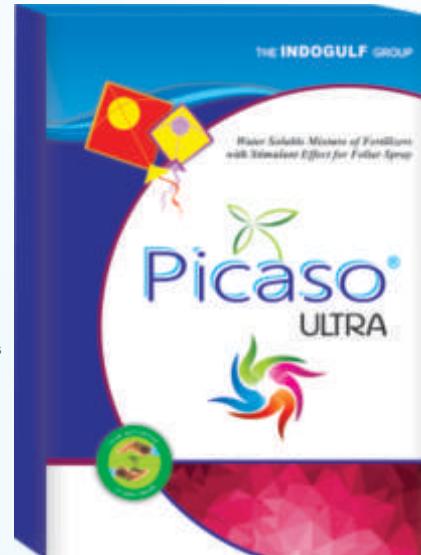
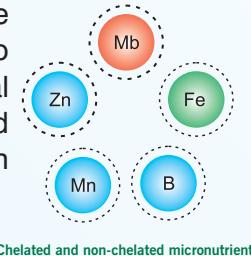


Product Description

PICASO ULTRA is a water soluble NPK fertilizer in the form of crystalline powder, which by its high content of Potassium, phosphorus and micronutrients favours the processes related to rooting, flowering and fruit set. Due to its balance of macro and microelements it is a nutritional supplement for cultivation, increasing production and quality. It can be applied as a foliar spray or by fertigation systems.

Product Features and Benefits

- Convenient application with 100% Water Solubility.
- High Availability, containing chelated microelements to improve the absorption and plant nutrient efficiency.
- This combination is intended to stimulate root development, plant growth and fruit set.
- Reduces application times, dosage and nitrogen loss; saves labor.



Direction of Use

It can be used for all types of crops especially during fruiting stage which helps to improve quality of fruits and pod formation.

Foliar spray: Use 1.25-1.5 kg/Ha/application. Repeat each spray at 15 days interval.

Drip irrigation: 1.25-1.5 kg/Ha/application. Repeat each application at 15 days interval.

It is non-phytotoxic at recommended rates.

Products blended with irrigation water should be used immediately and not stored for long periods.

Proper coverage of plant is must for effective result.

Note: Recommendations are based on local soil and water analysis. Please contact your local speciality fertilizer adviser for your personalised fertilizer recommendation.



For Golden Harvest and Prosperity

gold

Picaso Gold is a liquid formulation of major and micro nutrients essential for plant growth and production

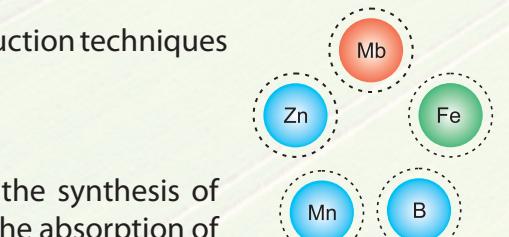
- It is in chelated form for easy and complete availability to the plant.
- Picasso gold is manufactured using Latest production techniques

Features

- It boost the plant metabolism which helps the synthesis of carbohydrates and proteins and also helps in the absorption of nutrients from soil.
- It enhances immunity of the plant against insect pests and diseases and its use enhances the quality of the produce
- It enhances the flowering and fruiting and prevents fruit drop
- It increases the fertiliser use efficiency.

Use Instructions

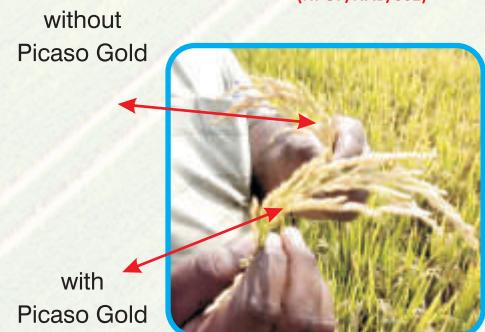
- Picasso Gold 250 ml per acre in 120-150 lit water
- Use after 25-30 days after sowing and repeat 15 days after the first spray.
- Crops- it can be used on all crops such as Cereals, Vegetables, Pulses, Oilseeds, Orchards, Plantation, Flower and Landscaping and Home Gardening etc.



Chelated and non-chelated micronutrients



Approved input for organic farming
as per NPOP standards
Attested by Ecocert India Pvt. Ltd.
(NPOP/NAB/002)



Bumper Harvest



Growth



Immunity



ROOT-O-MAX GOLD

GROWTH PARTNER OF YOUR CROPS

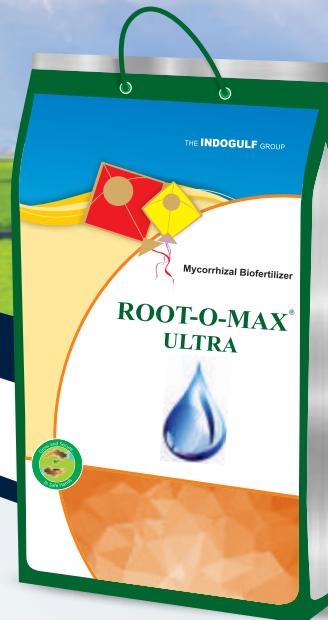
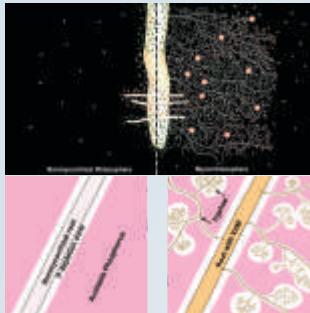
- Root O Max Gold is a new generation granular rooting stimulant and soil conditioner that provides all the elements necessary for the root initiation, vegetative and reproductive growth of the plant.
- It is manufactured by processing of rare seaweeds using advanced technology which naturally contains alginic acid, phytohormones and nutrients.

Benefits

- Stimulates root development by providing the necessary nutrients and plant growth hormones necessary for rapid root development.
- Enables early establishment of plant: Better number of tillers, green foliage due to production of chlorophyll.
- Conditions the soil by stabilizing the soil structure and increasing the water holding capacity of the plant.
- Protects plants from biotic and abiotic stress (excessively high or low temperature, water logging, drought, frost etc)



CROPS	DOSAGE
Field Crops (Wheat, Paddy, Pulses, Oilseeds etc)	4 – 5 Kg per acre
Vegetables & Commercial Crops	8 – 10 Kg per acre
Sugarcane	8 – 10 Kg per acre
Cotton	8 – 10 Kg per acre
Flowers	8 – 10 Kg per acre
Lawn & Kitchen Garden	2 – 3 gms per square meter
Plantation Crops	100 – 250 gms per tree based on age
Usage: Recommended quantity to be applied as basal dressing. It can also be used in standing crop mixed with fertilizers	



Root-O-Max Ultra

Root-O-Max Ultra is a powerful mix combination of **Root-O-Max Gold** that gives root and shoot developments. It is a bio – fertilizer in granular formulation that provides balanced nutrition to the plant.

It combines the power of Root-O-Max Gold and mycorrhizae. The mycorrhizae takes about 15 days' time to establish in the roots and spread in the soil. It helps in absorption of nutrient and moisture much more efficiently than the root hairs could alone manage.

Benefits :

- Helps the plant in early establishment
- Increases use efficiency of fertilizers. Hence the fertilizer applied in the crop gives significantly better nutrition to the crop as compared to control.
- Helps the plant to combat abiotic and biotic stress. Hence the plant can survive and maintain its productivity in adverse conditions also.
- Enhances the yield and quality of the produce. Thereby fetching better prices leading to the prosperity of the farmer.

Directions for Use

This product is in granular form and hence can be mixed easily with any fertilizer without impacting efficacy of the product. For best results, it should be incorporated in the soil along with the basal dose of fertilizers. If that is not feasible, it may be top-dressed in standing crop also. In orchards, it may be applied along with other fertilizers in ring around the trees.

Recommended Dose :

Crop types	Dose per Acre (Kg)	Application window
Cereals, Pulses, Oilseeds	3.5	Basal or top dressing withing 30 DAS / DAT
Vegetables, Potato, Sugarcane, Flowers and other Commercial Crops	7 – 10	3.5 Kg as Basal, rest as top dressing after 30 DAP. In Vegetables, top dressing @ 2 Kg per acre after every picking
Fruit Trees	50 – 150 gm per Tree	Use as Basal while Planting. Subsequent application annually during fertilizer application. Dose depends upon the age of the tree.

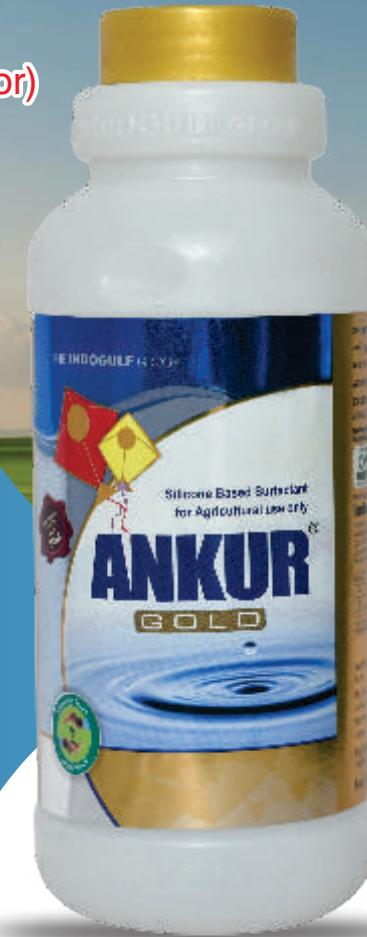
ANKUR

GOLD



Enhances the Performance of every spray (A Multipurpose silicone based super spreader and activator)

Ankur Gold is a new generation silicone based multipurpose super spreader and activator, that can be used to enhance the performance of any Insecticide, Fungicide, Herbicide, Water Soluble Fertilizer or Plant Growth Regulator



Features

- It rapidly spreads the spray droplets on the leaf surface to make a uniform layer on the leaf
- It reduces wastage of spray liquid, water and spraying cost.
- Ensures that every spray is effective and reliable within a few minutes of spraying, thus providing complete peace of mind to the farmer even during rains
- It is non ionic in nature, and hence doesn't change the nature of any agrochemical. Therefore can be mixed with all agrochemicals
- It is more effective than ordinary surfactants and sticking agents
- It also enhances spread of irrigation water, thus making the use of water more efficient

How to Use

Fill the tank 90% with agrochemical mixture as per the product Label, Add **Ankur gold** @ 2-3 ml per liter of spray solution. Mix well and then top up the spray tank

Quantity

4-8 ml per 15 Lit Spray tank or 60-100 ml per acre mixed with 10 Kg sand for Irrigation water spreading

Without Ankur Gold



With Ankur Gold



Can be applied in all crops and with all Agro Chemicals

Biogold

Organic Sea weed soluble Flakes

What is Biogold??

- Superior combination of cold water seaweeds taken from exclusive sources and processed with latest technology. It is 100 % Water soluble
- Helps in absorption of spectrum of nutrients (Micro and Macro) readily for plants
- It is an excellent Soil Conditioner
- Contains natural plant growth hormones - Cytokinins, Giberellins, Alginine, and Polyscccharides
- It is effective for seed treatment, soil application as well as Foliar spray.
- It can be applied in all crops- Cereals, Pulses, Oilseeds, Vegetables, Fruits and Plantation crops.

Advantages

- Increases the germination percentage and yield of crop.
- Enlarge and balance leaf growth,
- Improve Biotic and Abiotic Stress resistant capability.
- Promote flower bud differentiation, improve blossom and fruit set rate, increase yield and quality of crops, make fruit pre-mature 3 or 7 days and prolong the shelf life, provides uniform coloration and size of fruits

How to apply

Seed Dressing :

- For seeds with higher Seed rate e.g. Wheat, Rice, Pea, Gram etc- use 1 gm Biogold per kg seed.
- For small to medium sized seed, use 15-20 gm for seed per kg seed
- For tubers, sugarcane and seedling dip, use a slurry containing 5 gm Biogold per kg seed.

Foliar spray

- Use 100 gm Biogold per acre after 15-20 days of sowing/planting and repeat after 10-15 days.

Drip-

- Use 0.5-1 gm per litre of water applied through drip.
- In case of Phytotoxicity, use Biogold @ 200 gm per acre and repeat after 7 days.

Compatibility

Biogold can be mixed with any fungicide, insecticide or fertiliser. For best results, use Ankur gold for ensuring quick absorption in the plant system



Picaso[®] POWER

Powerful Nutrition for
YOUR CROPS

What is Picaso Power

- Picaso Power is the next generation chelated micronutrition product for catering to balanced nutritional needs of all crops in every agroclimatic condition. It is intended for spraying or use in drip irrigation also.
- Picaso Power has been enriched with ingredients that enhance plant growth and quality of the produce.
- The product is cleated and readily available food for the plant.

Benefits

- The product is 100% water soluble. It is presented in 30 gm pouch that can be easily used directly in a 15 ltrs spray tank.
- Being chelated, it is compatible with all fertilizers and agrochemicals.
- It has power of nutrition and naturally occurring ingredients. Hence it is much more powerful than traditional micronutrients and is safe for all crops.

Product Usage

- This product can be used in all cereals, pulses, vegetables, fruits and plantation crops.
- Dosage per 15 ltr tak is 1 pouch of 30 gm. Use 120 – 150 ltrs (8 – 10 tanks) water per acre.
- We recommend 1 spray at growth stage of most crops, repeat spray during flower initiation is advisable
- In multiple picking crops, spraying Picaso Power after each picking has been found befeical.

Packing

- 4 pouches of 30 gm each
- 500 gm bulk Jar



Crop- Okra- Treatment- Picaso Power



Empire



EMPIRE is a unique blend of plant nutrients along with naturally occurring chelating agents such as amino acids fulvic acid, seaweed extracts and humates. It is a revolutionary new formula for crop growth and optimal yields.

EMPIRE is readily absorbed and assimilated by the plant through leaves and roots when applied on foliage or in the soil.

EMPIRE is recommended to enhance root, shoot, leaves, flowers and fruits in all crops

Fruit trees: Citrus trees, Grape Vines, Guava, Pomegranate, Banana, Mango etc.

Food Crops: Wheat, Paddy, Barley, Pearl millet, Sorghum, Ragi etc.

Oilseed Crops: Mustard, Groundnut, Sesame, Linseed etc.

Pulse Crops: Greengram, Horsegram, Arhar, Rajmah, Chickpea, Blackgram, Soybean etc.

Commercial Crops: Cotton, Sugarcane, Coffee, Tea, Sunnhemp, Jute etc.

Vegetables Crops - Tomato, Brinjal, Cole crops, Potato, Chilli, Cucurbits, Onion, Leafy Vegetables.

Flowers and Ornamental crops: Rose, Dahlia, Jasmine, Chrysanthemum, Lily etc.

Medicinal Crops: Isabgol, Tulsi, Aonla, Mentha, Mehandi etc.

Fodder Crops: Berseem, Lucerne, Oat, Napier grass etc.

EMPIRE is recommended during active growth and at flowering stage. Its use in nursery and in young plantations is also recommended.



Empire helps the plant to recover from stress due to drought, hailstorm, flood phytotoxicity, pest infestation etc.

Dosage and use: **EMPIRE** has a flexibility of usages as foliar spray, soil application or fertigation. The number of applications & timing depends on the crops and stages. However application at the time of vegetative growth, flowering, fruit-setting, ripening stages are the most important.

Foliar spray: Empire is to be applied on all above crops as mentioned @ 240 gm per acre (2.5 gm per ltr. of water) and repeat 2-3 sprays at 15-20 days interval.

Packing

- 120 gm
- 240 gm

**Premium Organic Nutrition for
Royal Treatment for your Crops**



Indo APACHE

Description

INDO APACHE comprises a mixture of Humic Acid, Fulvic Acid and Potash, Indo Apache changes the fixation properties of the soil by increasing the buffering nature of the soil through cation exchange capacity, it is a unique and highly beneficial feature of Apache because many of the nutrients that plants need such as Magnesium, Calcium, Iron, and other trace minerals are easily available to the root system of the plant through Cation Exchange Capacity (CEC).

Product Features

- INDO APACHE increases cell wall permeability in plants. When cell membranes become more permeable, nutrients can more easily enter through the plant (often carried by fulvic acid)
- INDO APACHE increases the water infiltration and water holding capacity of the soil. It greatly improve the soil, increase the plant root growth and metabolism, and help plants deal with the environmental stresses
- INDO APACHE neutralizes both acidic & alkaline soil to release the beneficial metal ion, thus promote water absorption by plants.
- INDO APACHE enhances the photosynthesis of crops that makes vegetables grow vigorously, increases the yield per unit area.
- INDO APACHE promotes more flowers and fruit setting resulting in better quality produce.
- INDO APACHE can be used as Fertigation, Drip Irrigation and Foliar Spray thus vital for both the health of plants and for growers' economic well-being.



Recommendation

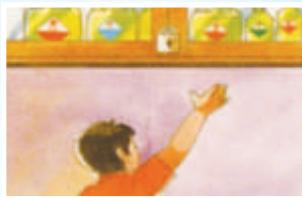
RECOMMENDED CROPS	DOSAGES/ACRE	
	Soil Application	Foliar Application
Rice, Wheat, Maize, Pigeon Pea, Black Gram, Gram, etc.	400-500 gm	200-250 gm
Sugarcane, Potato, Tomato, Brinjal, Okra, Chilli, Peas, Cucurbits, Tea, Cotton, Tobacco, Jute, Mentha, etc.	500-700 gm	300-400 gm
Banana, Mango, Pomegranate, Citrus, etc. As Top Dressing	2-3.5 gm	

Packing :- 250 gm | 500 gm | 1 kg

SAFE USE OF PESTICIDES



Buy pesticides in original packing with bill.



Store under lock and Keep out of reach of children.



Read label and leaflet before use.



Measure recommended quantity correctly.



Do spray along the wind.



Take bath and wash clothes after application.



Give first-aid in case of accidental poisoning and call the doctor.



Destroy and bury empty containers.



Do not smoke, drink or eat while spraying.



Do not allow children to spray.



Do not use leaky or damaged sprayer or duster.



Do not keep the food stuff near the site of application.



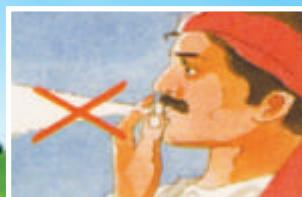
Avoid environmental contamination.



Do not transport pesticides along with food stuff.



Do not use pesticides containers for food or water.



Do not blow your mouth to clean nozzle.

Contents :

- Safety Glasses : 1 Pc
- Face Mask : 1 Pc
- Disposable Cap : 2 Pcs
- Surgical Gloves : 2 Pairs
- Apron : 5 Pcs



Safe Use of Pesticides by The Farmers While Purchasing, Handling and Use

While Purchasing

- ✓ Purchase pesticides/biopesticides only from Registered pesticide dealers having valid Licence. Do not purchase pesticides from foot path dealers or from un-licensed person.
- ✓ Purchase only just required quantity of pesticides for single operation in a specified area. Do not purchase pesticide in bulk for whole season.
- ✓ See approved labels on the containers/packets of pesticides. Do not purchase pesticides without approved label on the containers.
- ✓ See Batch No., Registration Number, Date of Manufacture/ Expiry on the labels. Never purchase expired pesticide.
- ✓ Purchase pesticides well packed in containers. Do not purchase pesticides whose containers are leaking/loose/ unsealed.

During Storage

- ✓ Store the pesticides away from house premises. Never store pesticide in house premises.
- ✓ Keep pesticides in original containers. Never transfer pesticides from original to another containers.
- ✓ Pesticides/weedicides must be stored separately. Do not store insecticides with weedicides.
- ✓ Where pesticides have been stored, area should be marked with warning signs.
- ✓ Pesticides be stored away from the reach of the children and live stocks. Do not allow children to enter the storage place.
- ✓ Storage place should be well protected from direct sunlight and rain. Pesticides should not be exposed to sunlight or rain water.

While Handling

- ✓ Keep pesticides separate during transportation. Never carry/transport pesticides along with food/fodder/other eatable articles.
- ✓ Bulk pesticides should be carried tactfully to the site of application. Never carry bulk pesticides on head, shoulder or on the back.



While Preparing Spray Solution

- ✓ Always use clean water. Do not use muddy or stagnant water.
- ✓ Use protective clothing viz., hand gloves, face masks, cap, apron, full trouser, etc. to cover whole body. Never prepare spray solution without wearing protective clothings.
- ✓ Always protect your nose, eyes, ears, hands, etc. from spill of spray solution. Do not allow the pesticide/its solution to fall on any body parts.
- ✓ Read instructions on pesticide container label carefully before use. Never avoid reading instructions on container's label for use.
- ✓ Prepare the solution as per requirement. Never use left out spray solution after 24 hours of its preparation.
- ✓ Granular pesticides should be used as such. Do not mix granules with water.
- ✓ Avoid spilling of pesticides solutions while filling the spray tank. Do not smell the spray tank.
- ✓ Always use recommended dosage of pesticide. Do not use overdose which may affect plant health and environment.
- ✓ No activities should be carried out which may affect your health. Do not eat, drink, smoke or chew during whole operation of pesticides.

Selection of Equipments

- ✓ Select right kind of equipments. Do not use leaky or defective equipments.
- ✓ Select right sized nozzles. Do not use defective/non- recommended nozzles. Do not blow/clean clogged nozzles with mouth. Instead use tooth brush tied with sprayer.
- ✓ Use separate sprayer for insecticides and weedicides. Never use same sprayer for both weedicides and insecticides.

While Applying Spray Solutions

- ✓ Apply only recommended dose and dilution. Never apply over-dose and high concentrations than recommended.
- ✓ Spray operation should be conducted on cool and calm day. Do not spray on hot sunny day or strong windy conditions.
- ✓ Spray operation should be conducted on sunny day in general. Do not spray just before rains and immediately after the rains.
- ✓ Use recommended sprayer for each spray. Emulsifiable concentrate formulations should not be used for spraying with battery operated ULV sprayer.
- ✓ Spray operation should be conducted in the wind direction. Do not spray against wind direction.
- ✓ After spray operation, sprayer and buckets should be washed with clean water using detergent/soap. Containers and buckets used for mixing pesticides should never be used for domestic purpose even after thorough washing.
- ✓ Avoid the entry of animals/workers in the field immediately after spray. Never enter in the treated field immediate after spray without bearing protective clothings.

After Spray Operation:

- ✓ Left over spray solutions should be disposed off at safer place viz. barren isolated area. Left over spray solution should not be drained in or near ponds or water lines etc.
- ✓ The used/empty containers should be crushed with stone/stick and buried deep in soil away from water sources. Empty containers of pesticides should not be re-used for storing other articles.
- ✓ Wash hands and face with clean water and soap before eating/smoking. Never eat/smoke before washing clothes and taking bath.
- ✓ On observing poisoning symptoms give the first aid and show the patient to doctor. Also show the empty container to doctor. Do not take the risk by not showing the poisoning symptoms to doctor as it may endanger the life of the patient.



Pesticides Toxicity Symbols Denote Toxicity To Human Beings And Animals

WARNINGS

CATEGORY -I

Keep out of reach of Children. If swallowed or if symptoms of poisoning occur, call physician immediately.
 LD_{50} (oral) (Mg/kg) 1 to 50

CATEGORY -II

Keep out of reach of children
 LD_{50} (oral) (Mg/kg) 51 to 500

CATEGORY-III

Keep out of the reach of Children
 LD_{50} (oral) (mg/kg) 501-5000

CATEGORY-IV

Keep out of the reach of children
 LD_{50} (oral) (mg/kg) More than 5000

SYMBOLS

EXTREMELY TOXIC



HIGHLY TOXIC



MODERATELY TOXIC



SLIGHTLY TOXIC



Antidote & Medical Aid

- Symptoms of poisoning are headache, giddiness, vertigo, nausea, vomiting, blurred vision, sweating, excessive lacrimation and salivation.
- In case of contact with skin, wash all the affected body parts thoroughly with soap and water several times. Remove patient to fresh air. If eyes are affected, drain with clear water for 15 minutes. Atropine sulphate is antidote for severe poisoning.
- Atropinize the patient immediately by repeated doses of 2 to 4 gm at every 5-10 minutes interval till the symptoms disappear.
- 2 PAM is also an antidote.
- Administer 1-2 gm of 2-pyridine-2 aldoxime methyl iodine (2-PAM), dissolve in 10 ml distilled water and inject intravenously taking 10-15 minutes.
- Storage/Disposal of pesticides :-
- Should be stored in separate well ventilated room under lock and key. Do not allow children, pest or animals to enter the room. Food and feed stuffs should not be stored with the pesticides. Empty containers should not be reused for any purpose and should be destroyed.
- All information in this book are for educational purpose only. Users are advised to consult to local agricultural experts before applying any product.



Some Important Abbreviations

Code Term

AB	Grain bait
AE	Aerosol dispencer
AL	Any other liquid
AP	Any other powder
BB	Block bait
BR	Briquette
CB	Bait concentrate
CF	Capsule suspension for seed treatment
CG	Encapsulated granule
CL	Contact liquid or gel
CP	Contact powder
CS	Capsule suspension
DC	Dispersible concentrate
DL	Driftless formulation #
DP	Dustable Powder
DS	Powder for dry seed treatment
DT	Tablet for direct application
EC	Emulsifiable concentrate
ED	Electrochargeable liquid
EG	Emulsifiable granule
EO	Emulsion, water in oil
EP	Emulsifiable powder
ES	Emulsion for seed treatment
EW	Emulsion, oil in water
FD	Smoke tin

Code Term

FG	Fine granule
FK	Smoke candle
FP	Smoke cartridge
FR	Smoke rodlet
FS	Flowable concentrate for seed treatment
FT	Smoke tablet
FU	Smoke generator
FW	Smoke pellet
GA	Gas
GB	Granular bait
GE	Gas penetrating product
GF	Gel for seed treatment
GG	Macrogranule
GL	Emulsifiable gel
GP	Flo-dust
GR	Granule
GS	Grease
GW	Water soluble gel
HN	Hot fogging concentrate
KK	Combi-pack solid/liquid
KL	Combi-pack liquid/liquid
KN	Cold fogging concentrate
KP	Combi-pack solid/solid
LA	Lacquer
LS	Solution for seed treatment

Code Term

MC	Mosquito coil
ME	Micro-emulsion
MG	Microgranule
MV	Vaporizing mats
OD	Oil dispersion
OF	Oil miscible flowable concentrate (oil miscible suspension)
OL	Oil miscible liquid
OP	Oil dispersible powder
PA	Paste
PB	Plate bait
PC	Gel or paste concetrate
PO	Pour-on
PR	Plan rodlet
PS	Seed coated with a pesticide
RB	Bait (ready for use)
SA	Spot-on
SB	Scrap bait
SC	Suspension concentrate (=flowable concentrate)
SD	Suspension concentrate for direct application
SE	Suspo-emulsion

Code Term

SG	Water soluble granule
SL	Soluble concetrate
SO	Spreading oil
SP	Water soluble powder
SS	Water soluble powder for seed treatment
ST	Water soluble tablet
SU	Ultra-low volume (ULV) suspension
TB	Tablet
TC	Technical material
TK	Technical concentrate
TP	Tracking powder*
UL	Ultra-low volume (ULV) liquid
VP	Vapour releasing product
WG	Water dispersible granule
WP	Wettable powder
WS	Water dispersible powder for slurry seed treatment
WT	Water dispersible tablet
XX	Others
ZC	A mixed formulation of CS and SC
ZE	A mixed formulation of CS and SC
ZW	A mixed formulation of CS and EW

SOIL CONDITIONER		BRAND NAME		TECHNICAL	
BRAND NAME	TECHNICAL	BRAND NAME	TECHNICAL	BRAND NAME	TECHNICAL
Indo Mychoriza	- Mycorrhiza	Rusmitre-50	- Ethion 50% EC	Rusphort	- Cholorpyriphos 10% GR
Root O Max Gold	- Sea Weed Extract	Spine-505	- Chlorpyriphos 50% + Cypermethrin 5% EC	Srigent	- Fipronil 0.3% GR
Root O Max Ultra	- Mycorrhiza Speical	Dawn Super	- Imidacloprid 30.5% SC	Domistar	- Emamectin Benzoate 3 % + Thaimethoxam 12 % WG
Bio King	- Sea Weed Extract	Paarth	- Dinotefuran 15% + Pymetrozine 45% WG	Pyrifen	- Pyriproxyfen 10 % + Bifenthrin 10 % W/W EC
SOIL NUTRIENT CORRECTOR		Srigent Ultra	- Fipronil 00.60 % W/W GR	Spiderman	- Spiromesifen 22.9% SC
Zinc Super Plus	- Micronutrient Mixutre	Abamite	- Abamectin 1.9% EC	BIOSTIMULANT	
Zinc Super Gold	- Micronutrient Mixutre	Acer	- Carbendazim 12% + Mancozeb 63% WP	FOLIAR NUTRIENT CORRECTOR	
Kargil 909	- Sulphur 90% WDG	Buzzer	- Difenconazole 25% EC	Indogulf B 20	- Boron
BIOSTIMULANT		Fang-75	- Sulphur 65% + Tebuconazole 10% WDG	Jagromin 99	- Micronutrient Mixutre
Empire	- Seaweed Extracts, Amino Acid, Fulvic Acid, Protein Derivatives	Logic	- Azoxystrobin 18.2% + Difenconazole 11.4% SC	Picaso Gold	"Chelated Micronutrients With EDTA Iron (Fe), Zinc (Zn), Manganese (Mn), Copper (Cu)"
Indo Apache	- Humic Acid; Fulvic Acid; K2O	Indogulf Valida	- Validamycin 3% L	Picaso Power	Iron (Fe), Zinc (Zn), Manganese (Mn), Magnesium (Mg), Copper (Cu), Boron (B), Amino Acid
Indo Breeza	- Sea Weed Extract (US Tech)	Collector	- Thifluzamide 24% SC	Picaso Ultra	Potassium (K2O) Phosphorous (P2O5), Iron (Fe), Manganese (Mn), Magnesium (Mg), Boron (B), Molybdenum (Mo), Zinc (Zn)
Indo Biogold	- Sea Weed Extract	Kargil	- Sulphur 80% WDG	Sona Shree 33	Zinc Sulphate 33%
FOLIAR NUTRIENT CORRECTOR		Nector Plus	- Hexaconazole 5% SC	Sona Shree Gold	Chelated Zinc 12%
Indogulf B 20	- Boron	Refery	- Azoxystrobin 11%+Tebuconazole18.3% SC	Pradhan	Npk 19:19:19
Jagromin 99	- Micronutrient Mixutre	Remote Power	- Captan 70% + Hexaconazole 5% WP	Pradhan Plus	Npk 13:0:45
Picaso Gold	"Chelated Micronutrients With EDTA Iron (Fe), Zinc (Zn), Manganese (Mn), Copper (Cu)"	Rexcel	- Tebuconazole 2% DS	Indogul Can	Calcium 18.5% + Nitrates 15.5%
Picaso Power	Iron (Fe), Zinc (Zn), Manganese (Mn), Magnesium (Mg), Copper (Cu), Boron (B), Amino Acid	Sandesh	- Isoprothiolane 40% EC	Green Valley	Calcium Based Liquid
Picaso Ultra	Potassium (K2O) Phosphorous (P2O5), Iron (Fe), Manganese (Mn), Magnesium (Mg), Boron (B), Molybdenum (Mo), Zinc (Zn)	Aman	- Thiophanate Methyl 70% WP	FOLIAR VIGOUR ENHANCER	
Sona Shree 33	Zinc Sulphate 33%	Coprus	- Copper Oxy.Chloride 50% WP	Sona Shree Gold	Chelated Zinc 12%
Sona Shree Gold	Chelated Zinc 12%	Indogulf C50	- Captan 50% WP	Pradhan	Npk 19:19:19
Pradhan	Npk 19:19:19	Indogulf Z80	- Ziram 80% WP	Pradhan Plus	Npk 13:0:45
Pradhan Plus	Npk 13:0:45	Jannat	- Propineb 70% WP	Indogul Can	Calcium 18.5% + Nitrates 15.5%
Indogul Can	Calcium 18.5% + Nitrates 15.5%	Orozeb	- Mancozeb 75% WP	Green Valley	Calcium Based Liquid
Green Valley	Calcium Based Liquid	Srilaxyl	- Metalaxyl 8%+Mancozeb 64% WP	PLANT GROWTH REGULATOR	
Gajab Ultra	- Gibberallic Acid 0.001% L	Srilaxyl 35	- Metalaxyl 35% WS	Sriculan Plus	- Triacontanol 0.01%
Ruspon	- Ethephon 39% SL	Srizol	- Propiconazole 25% EC	Jolt	- EwPaclobutrazole 23 %
PLANT GROWTH REGULATOR		Veer	- Tricyclazole 75% WP	Sriculan Gold	- SCTriacontanol 0.05% GR
Sriculan Plus	- Triacontanol 0.01%	Figon	- Tebuconazole 25.9% EC	Jolt	- EwPaclobutrazole 23 %
Jolt	- EwPaclobutrazole 23 %	Tango Super	- Propiconazole 13.9% + Difenaconazole 13.9% EC	Sriculan Gold	- SCTriacontanol 0.05% GR
Sriculan Gold	- SCTriacontanol 0.05% GR	Wind	- Myclobutanil 10 % WP	STRESS MANAGEMENT	
Ankur Gold	- Adjuvants	Gulf Top	- Pyrazosulfuron Ethyl 10% WP	Ankur Gold	- Adjuvants
Bactro Plus Gold	- Immuno Modulator	Jai Ho +	- Clodinafop Propargyl 9% Metribuzin 20% WP	Bactro Plus Gold	- Immuno Modulator
INSECTICIDE		Orion Gold	- Bispyribac Sodium 10% SC	Baton	- Lamba Cyhalothrin 4.9% CS
Baton	- Lamba Cyhalothrin 4.9% CS	Indogulf Alto	- Metsulfuron Methyl 20% WP	Dawn-7000	- Imidacloprid 70% WG
Dawn-7000	- Imidacloprid 70% WG	Indomix Power	- Chlorimuron Ethyl 10% + Metsulfuron Methyl 10% WP	Dhamaal-50	- Pymetrozine 50% WDG
Dhamaal-50	- Pymetrozine 50% WDG	Krift Plus	- Pretilachlor 37% EW	Dominator	- Emamectin Benzoate 5% SG
Dominator	- Emamectin Benzoate 5% SG	Bound Off	- Glyphosate 41% SL	Farrate	- Lambda Cyhalothrin 5% EC
Farrate	- Lambda Cyhalothrin 5% EC	Cut Off	- 2,4-D Ethyl Ester 38% EC	Indogen	- Chlorantraniliprole 18.5% SC
Indogen	- Chlorantraniliprole 18.5% SC	Cut Off - 58	- 2,4-D Amine Salt 58% SL	Jabar	- Thiamethoxam 75% SG
Jabar	- Thiamethoxam 75% SG	Cut Off 80	- 2-4D, Sodium Salt 80% WP	Plano Gulf	- Thiamethoxam 12.6% + Lambda Cyhalothrin 9.5% ZC
Plano Gulf	- Thiamethoxam 12.6% + Lambda Cyhalothrin 9.5% ZC	Factor	- Fenoxaprop-P-Ethyl 9.3% EC	Prominent	- Dinotefuron 20% SG
Prominent	- Dinotefuron 20% SG	Fire	- Paraquat Dichloride 24% SL	Savera	- Thiamethoxam 30% FS
Savera	- Thiamethoxam 30% FS	Jai Ho	- Clodinafop-Properygl 15% WP	Indogulf Sitara	- Thiamethoxam 25% WG
Indogulf Sitara	- Thiamethoxam 25% WG	Krift	- Pretilachlor 50% EC	Spine	- Bifenthrin 10% EC
Spine	- Bifenthrin 10% EC	Meta Smart	- Fluazifop-P-Butyl 11.1% + Fomesafen 11.1% SL	Indo Twins	- Imidacloprid 40% + Fipronil 40% WG
Indo Twins	- Imidacloprid 40% + Fipronil 40% WG	Oxytech	- Oxyfluorfen 23.5% EC	Avon 25	- Lambda Cyhalothrin 2.5% EC
Avon 25	- Lambda Cyhalothrin 2.5% EC	Parker	- Pyriproxybac Sodium 6% + Quizalofop Ethyl 4% MEC	Spot	- Chlorpyriphos 16% + Alphacypermethrin 1% EC
Spot	- Chlorpyriphos 16% + Alphacypermethrin 1% EC	Peak	- Pinoxaden 5.1% EC	Srigent Plus	- Fipronil 5% SC
Srigent Plus	- Fipronil 5% SC	Penda Shree	- Pendimethalin 30% EC	Corsa - 808	- Profenofos 40% + Cypermethrin 4% EC
Corsa - 808	- Profenofos 40% + Cypermethrin 4% EC	Ruszine	- Atrazine 50% WP	Dawn 2000	- Imidacloprid 17.8% SL
Dawn 2000	- Imidacloprid 17.8% SL	Tower	- Ammonium Salt Of Glyphosate 71% SG	Furtex	- Chlorantraniliprole 0.4% GR
Furtex	- Chlorantraniliprole 0.4% GR	Trick	- Metribuzin 70% WP	Indomite	- Propergite 5 % EC
Indomite	- Propergite 5 % EC	Weeder	- Sulfosulfuron 75% Wg	Kranti-4G	- Cartap Hydrochloride 4% GR
Kranti-4G	- Cartap Hydrochloride 4% GR	Arjun 32	- Pendimethalin 30% + Imazethapyr 2% EC	L-Drint-20	- Chlorpyriphos 20% EC
L-Drint-20	- Chlorpyriphos 20% EC	Indo Everfast	- Quizalofop Ethyl 10% EC	Lehar	- Fenobucarb, B.P.M.C. 50% EC
Lehar	- Fenobucarb, B.P.M.C. 50% EC	Penda Power	- Pendimethalin 38.7% CS	Prize	- Acetamiprid 20% SP
Prize	- Acetamiprid 20% SP	Shaktiban	- Imazethapyr 10% SL	Rogorus	- Dimethoate 30% EC
Rogorus	- Dimethoate 30% EC	Super Mix	- Butachlor 50% EW	Rusban	- Chlorpyriphos 20% EC
Rusban	- Chlorpyriphos 20% EC	Alkazar	- Tembotrione 34.4 % SC	Rusdol	- Chlorpyriphos 1.5% DP

CSR
ACTIVITIES



The Agri Training School and Soil Testing Bus flagged off at Moradabad in February as a first collaboration between Nodal Training Institute, Agri Business Centre Scheme and The Indogulf Group. The running cost and the Soil testing facility has been provided by The Indogulf Group. The bus travels from village to village everyday and train farmers about new crops and methods of farming, the pests and safety of crops.

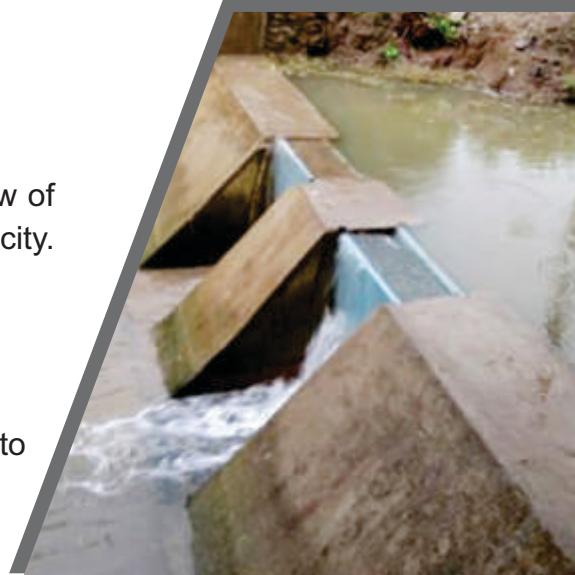
AGRI SCHOOL ON WHEELS



A check dam placed in the ditch, swale, or channel Interrupts the flow of water and flattens the gradient of the channel, thereby reducing the velocity. In turn, this obstruction induces infiltration and reduces eroding.

INDOGULF CROPSCIENCES LTD.

in collaboration with **Rotary Club of Delhi Rendezvous** is glad to announce another great initiative to build a Check Dam at Alwar





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