



Integrated Organic farming System (IOFS)

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Integrated organic Farming System(IOFS)

- Integrated Organic farming is the holistic production management system which promotes and enhances agriculture eco system health including biodiversity biological cycles and soil biological activities by integrating farming with livestock rearing ,agroforestry,fisheries and bee keeping.

Introduction

- In India the total live stock population is 529.7 million that contributes 15% of the total world live stock population.
- About 86% of the farmers doing cultivation along with live stock farming.
- Our present need is to produce healthy food ,lively wood and environment security.
- Only the solution is the integrated organic farming system.

Benefits

- To get continuous income through out the year.
- The output of one system will be the input for other system.
- To get employment for rural women and young enter pruners.
- To preserve the soil ecosystem and the environment .
- To produce on farm inputs so as to reduce the input cost upto 15%.

Concepts of IOFS

- The main concept of IOFS is to integrating all resources such as soil ,water,crop, live stock,labour,capital and energy.
- In addition to crop cultivation live stock ,agroforestry and allied activities are to be integrated in IOFS system.
- Habitat Management
- Diversity
- Integration of animals
- Conversion period

- 
- Contamination control
 - Soil and water conservation
 - Selection of seed and planting
 - Fertilization
 - Integrated Plant management
 - Equipments and storage
 - Bee keeping
 - Standards for animal production
 - Live fencing with green manure crops

Integrated Organic Farming

**Organic
Cattle
Feed**



**Healthy
Milk
Produce**



**Healthy Yield
through organic
Farming**



Professional composting

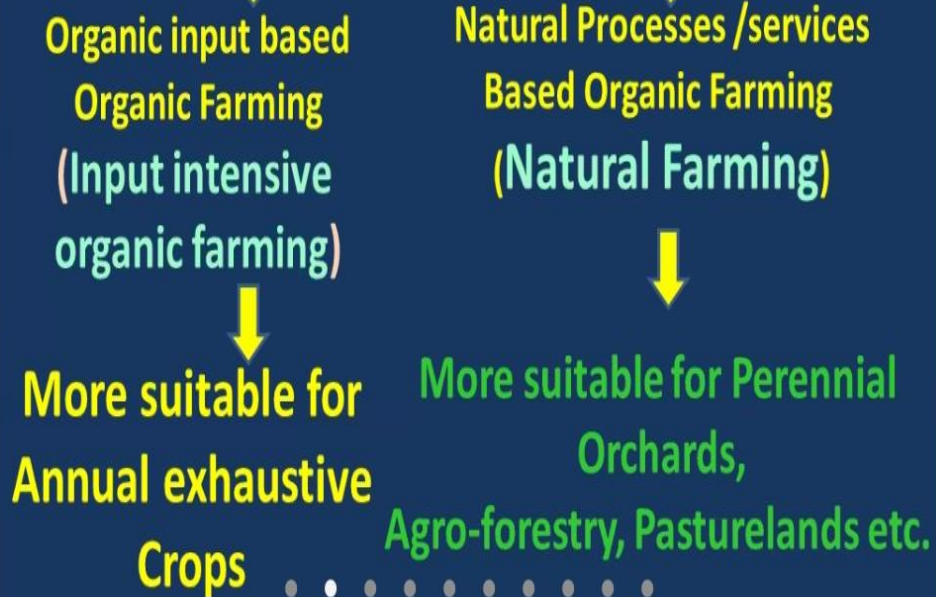
**Organic
replenishing
of land plots**





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"Organic Farming"





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National Centre Of Organic Farming



- NCOF is a nodal organization for promotion of organic farming from 2004 for implementing National Project on Organic Farming (NPOF)
- Promotion through technical capacity building, transfer of technology and input production
- Standards and testing protocols for biofertilizers and organic fertilizers.
- Promotion through low cost certification system-PGS India certification.
- Awareness creation and publicity through media





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National Programme for Organic Production (NPOP)

- It involves in the accreditation of Certification Bodies, standards for organic production, promotion of organic farming and marketing.
- Certification allows you to use the “India Organic” logo which conforms the NPOP standards.
- The unique feature of this scheme is to Promote group certification by capacity building through service provider where the service provider will help organic farmers by providing training.
- Provides standard for cultivation of crop, livestock, horticulture and allied activities



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Participatory Guarantee Systems

Zoom

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Participatory Guarantee Systems are based on collective guarantee by the producers

PGS is open and transparent and involves participation of consumers



Provides full traceability including direct access to producers

Largely depend upon direct access and trust between producers and consumers



Unmute

PGS-INDIA
ORGANIC



Share



Participants 65

More 5

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Guarantee System

Three Systems of Quality Guarantee



Brand Guarantee
By seller



Third party
Guarantee



Producers
Participatory
Guarantee

and
Interestingly

TRUST

is the foundation
of all the three



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Brand Guarantee

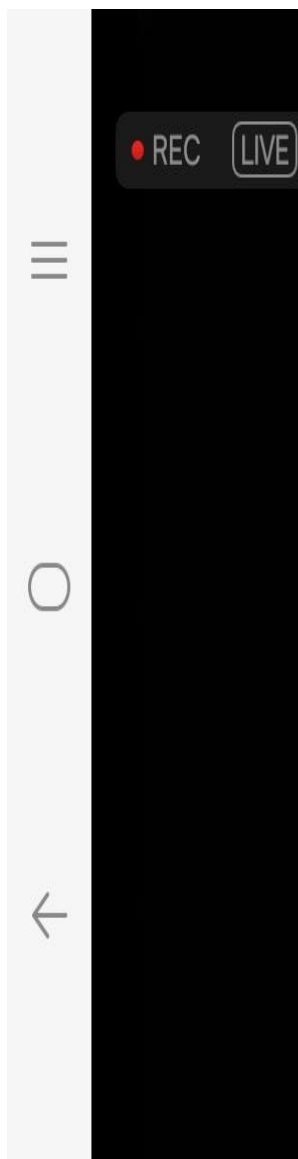
Brand guarantee is the assurance given by the seller and its acceptance is solely based on the trust of consumers

- Brand guarantee do not have any system of verification by consumers or any other agency
- There is no traceability
- And in case of default it is generally addressed by replacement of goods



Morarka
Organic





Jaivik Bharat Logo



- ✓ Circle represents holistic wellness, while symbolizing organic food with a letter "O".
- ✓ The Green leaf represents nature.
- ✓ Second leaf in the form of a Tick mark represents that FSSAI has certified the product.
- ✓ The Green colour symbolizes sustainable agriculture and healthy life.



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Integrated Pest Management

- Preventive measures given more preference (Preventive application of Organic pesticides)
- Increased biodiversity at organic farm
- Clean cultivation
- Cultural management
- Pest includes Weeds, Insect-pests, diseases, nematodes, wild animals/birds etc.



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Trap and antagonistic crops:

- Trap crops can be exploited to trap the juveniles before planting the actual crop. *Crotalaria* is an effective trap crop for root knot nematodes.
- Antagonistic crops secrete compounds which have toxic effect on nematodes, such as mustard, garlic, onion, marigold etc.



Biological control methods

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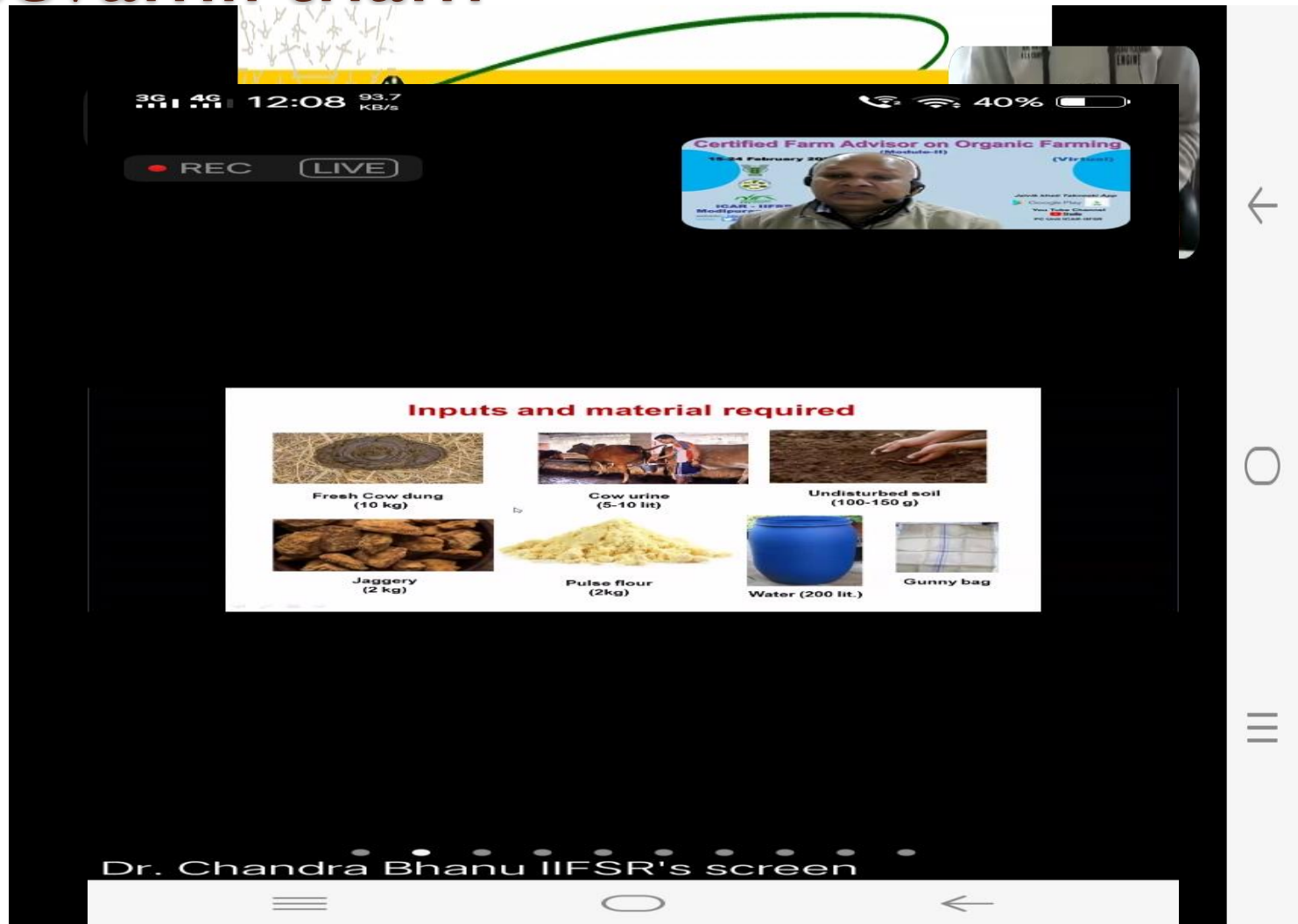
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Biological control of plant parasitic nematodes includes the use of predacious or parasitic organisms such as fungi, bacteria, viruses, protozoa, nematodes, tardigrades, terbellarians, collembolans, mites & enchytraeids etc. Among them fungi and bacteria constitute the most important group of nematode antagonists which has great potential for the management of plant parasitic nematodes in the field condition. As rhizospheres are complex environment where several microorganisms interact with each other. Number of microorganism, which play role of antagonist of plant parasitic nematodes, are the important component of rhizosphere. As now days we are more inclined for organic farming due to adverse effect of chemicals on environment and human health. In such farming system we must take lot of care to maintain the rich population of useful organisms in the soil to make soil more suppressive to plant diseases.

kamal khilari's screen



Jeevamirtham



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Method of application of Jeevamrit

Crop duration	Crop stages and Jeevamrit spray concentration		Total number of spray
	1 st spray and Concentration	Interval of subsequence spray and Concentration	
Short duration (60-90 days)	21 days after sowing/ planting @ 5%	20-25 days interval @ 10% concentration	Three (3)
Medium duration (90-120 days)	21 days after sowing/ planting @ 5%	20-25 days interval @ 10% concentration	Four (4)
Medium-long (120-135 days)	21 days after sowing/ planting @ 5%	20-25 days interval @ 10% concentration	Five (5)
Long duration (135-150 days)	21 days after sowing/ planting @ 5%	20-25 days interval @ 10% concentration	Six (6)
Fruit plants	2-5 lit. of jeevamrit should be applied in the basin once in a month.		



Beejamirtham preparation

Preparation protocol

Take 5 kg cow dung in a cloth and bound it by tape and hang this in the 20 liter water for 12 hours



Take one liter water and add 50 g lime in it, keep for a night.



Squeeze this bundle of the cow dung in water 2-3 times to extract material



Add the soil of same farm and stir it well



Add 5 liter cow urine in that solution & add the lime water and stir it well

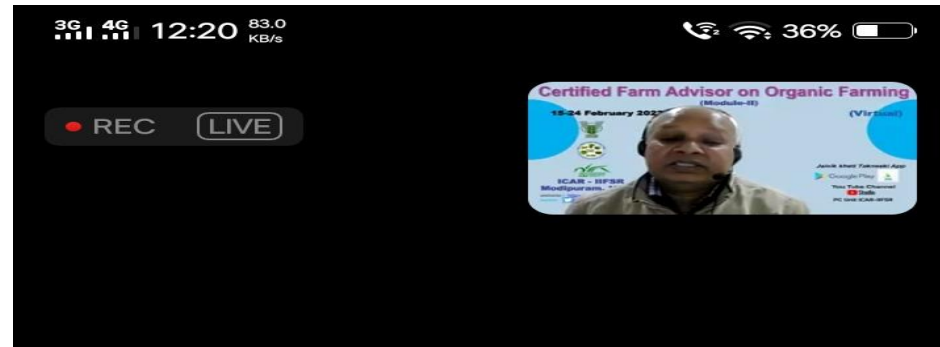


Beejamrit is ready to treat the seeds



Preparation of Ghana jeevamirtham





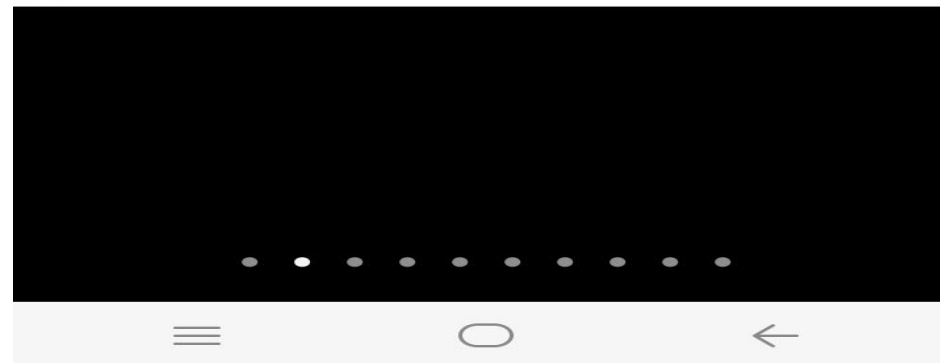
Ghan-Jeevamrit

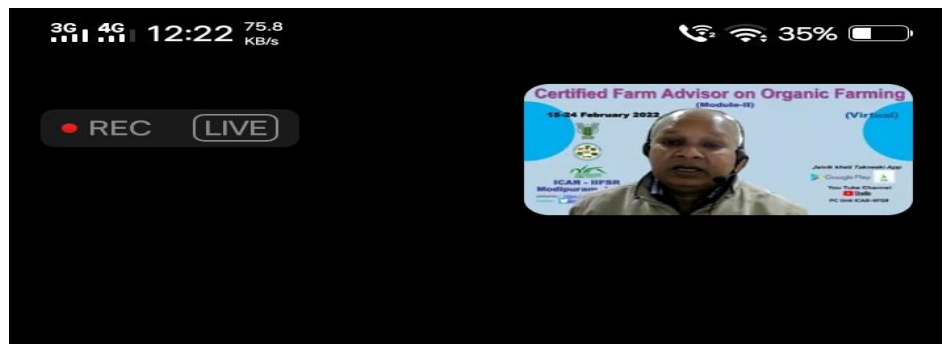
It is a concentrated from of Jeevamrit

It is the rich sources of beneficial micro flora which support, stimulate the plant growth



ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut (U.P.)





Preparation and Application

100 kg Desi Cow dung
(air dried for 4-5 days)



1 kg Gur (Jaggery)



1 kg Besan (Pulse flour)



2-3 lit Desi cow urine



250 g forest soil



Application: 250 kg/ha Ghanjeevamrit along with 250 kg/ha FYM

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Panchgavya

Panchgavya consists of nine products viz., cow dung, cow urine, milk, curd, jaggery, ghee, banana, tender coconut and water.

The product of local breeds of cow have potency than exotic breeds.

Method of preparation:

1. Mix 7 kg cow dung and 1 kg cow ghee (keep for 3 days)
2. Mix 10 lit. of cow urine and 10 lit. of water(Keep for 15 days)
3. Mix cow milk (3 lit.), cow curd (2 lit.), tender coconut water (3 lit.), jiggery (3 kg) and well ripened poovan banana (12 nos).
4. Panchgavya will be ready after 21 days.



Compost

- ❖ An organic matter (plant and/or animal residues), which has been degraded by the **action of microorganism** i.e. bacteria, fungi, actinomycetes etc. over a period of time is **known as compost**.
- ❖ Many types of organic matter, such as leaves, straw, fruit and vegetable peelings, and manures can be used to make compost.
- ❖ The degraded **end product** is very different from the original materials. It is **dark brown, crumbly** and has a pleasant smell.



Preparation of Compost

- ❖ Compost can be prepared using many materials produced in households and agricultural farms which we call otherwise.
- ❖ There are many methods of making compost out of which you may also know about many of these.
- ❖ Traditionally organic residues are piled up in a pit or as an open heap in the compound and left unmanaged.
- ❖ On the other hand a managed compost heap/ pit restores higher amount of nutrients when the compost is used.



Techniques for effective composting

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Pile size:

- ❖ Pile size should be sufficient enough to avoid anaerobic creation in too large piles and loss of heats in too small piles. (Generally 2 M wide and 1.5 M height, not less than 1 by 1 M)

Ventilation:

- ✓ Different techniques of ventilation such as punch holes, insertion of bamboo poles in piles, elevated platforms, use of perforated nets at the base etc. are useful for proper ventilation.

Turning

Proper turning at different time interval is essential.

Inoculation

- Inoculation with suitable microbes viz. *Trichoderma* sp, *Pleurotus* sp. Etc.



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Various Composting techniques

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Anaerobic Composting

- Bangalore Method
- Passive Composting of manure piles

Aerobic Composting

- Coimbatore Method
- Indore Method (Pit Method and Heap method)
- Chinese rural composting (High temperature method)
- Berkley rapid composting method - shredding and frequent turning
- Effective Microorganism based composting
- IBS Rapid composting
- NADEP composting
- Windrow composting
- Vermicompost
- Enriched composting • • • • • • • •



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Biodynamic Agriculture and composting

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- ✓ Biodynamic agriculture is an advanced organic farming system that emphasizes food quality and soil health.
- ✓ Biodynamic agriculture was developed out of eight lectures on agriculture given in 1924 by Rudolf Steiner, an Austrian scientist and philosopher.
- ✓ A basic ecological principle of biodynamics is to conceive of the farm as an organism, a self-contained entity.
- ✓ Emphasis is placed on the integration of crops and livestock, recycling of nutrients, maintenance of soil, and the health and wellbeing of crops and animals; the farmer.
- ✓ A fundamental tenet of biodynamic agriculture is that food raised biodynamically is nutritionally superior and tastes better than foods produced by conventional methods.
- ✓ While biodynamics parallels organic farming in many ways; especially with regard to cultural and biological farming practices. It is set apart from other organic agriculture systems by its association with the spiritual science of anthroposophy founded by Steiner, and in its emphasis on farming practices intended to achieve balance between the physical and higher, non-physical realms.



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The biodynamic agricultural practice beliefs fall into three categories

1. Beliefs about the nature of reality with regard to agriculture (ontological beliefs)
2. Beliefs about the nature of the relationship between the practitioner and agriculture (epistemological beliefs)
3. Beliefs about how the practitioner should go about working with agriculture (methodological beliefs).



The Biodynamic Composting Preparations

- ❖ A distinguishing feature of biodynamic farming is the use of nine biodynamic preparations described by Steiner for the purpose of enhancing soil quality and stimulating plant life.
- ❖ They consist of mineral, plant, or animal manure extracts, usually fermented and applied in small proportions to compost, manures, the soil, or directly onto plants, after dilution and stirring procedures called dynamizations.
- ❖ The original biodynamic (BD) preparations are numbered 500–508.



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Vermicomposting

- ❖ Vermicompost (also called worm compost, vermicast, castings, worm humus or worm manure) is the end-product of the breakdown of organic matter by some species of earthworms.
- ❖ Vermicompost is a nutrient-rich, natural fertilizer and soil conditioner. The process of producing vermicompost is called *vermicomposting*.
- ❖ The earthworm species (or composting worms) most often used are Brandling Worms (*Eisenia foetida*) or Red Wigglers (*Lumbricus rubellus*).



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orvense). It helps to cope with fungus diseases.

What worms require ?



The Five Essentials

Compost worms need five basic things:

1. An hospitable living environment, usually called "bedding"
2. A food source (should be low in protein content)
3. Adequate moisture (around 50% water content by weight)
4. Adequate aeration
5. Protection from temperature extremes therefore beds must be constructed under shade

Jairam Choudhary (IIFSR)'s screen

Oil cakes

- **Edible oil cakes:** linseed, groundnut, rapeseed and cotton seed
 - **Non-edible oil cakes:** castor, neem, mandus, karanja
- Neem cake contains the alkaloids-nimbin and nimbicidine which effectively inhibits the nitrification process
- They are insoluble in water but their N become quickly available to plants about a week or 10 days after application.



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Application of Trichoderma

Method of Application

1. **For farm residue decomposition:** Make the suspension of formulation of Trichoderma @5g/L water and spray over the farm residue. Spray sufficient quantity of suspension to moisten the substrate. Make the heap/pile of residue for about 15 days and thereafter residue is subjected for composting.
2. **For plant pathogens/nematode control and growth promotion:**
 - **Seed Treatment and bio-priming:** Make suspension of Trichoderma formulation @5-10g/L water. Add jaggery in suspension @1%. Take 50 ml of suspension and mix well with 1kg of seed. Keep the treated seed in shade for overnight and sow the seeds in morning (bio-priming).
 - **Seedling dip:** Mix 5-10 g of Trichoderma formulation in one litre of water. Dip the root portion of seedlings in the suspension for about 20 minutes and then transplant the seedlings.
 - **Soil application:** Apply 5 kg of Trichoderma formulation in soil at last tillage during land preparation. It can also be applied through soil drenching in standing crop. For this mix 5 kg of Trichoderma formulation in 1000 litres of water. Spray thoroughly over the soil.
 - **Foliar spraying:** For Rhizoctonia leaf spot/blight and some other foliar diseases of crops, mix 5-10 gram of Trichoderma formulation in 800 litres of water and spray over the crop.

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Fermented buttermilk

➤ Fermented buttermilk is prepared from buttermilk after its fermentation for 2-3 weeks

➤ It can be used to prevent a variety of crop diseases @1 lit in 10 lit of water



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Application of Neemastra

- The neemashta or neem-cow urine extract are easy to prepare on farm within 2-4 days.
- Fresh neemashta or 5 percent neem-cow urine extract is sprayed on crops to control insect-pests like aphids, jassids, mealy bugs, thrips, whiteflies, small caterpillars and other sucking pests.
- For spraying one hectare of crop 800-1000 L solution is required.



Preperation of neem seed extract

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Protocol

Take 5kg of well dried neem seed kernels (3-8 months old) from which external hair removed

Grind the powder gently to make fine powder with precaution that oil should not extract during grinding

Soak the kernel powder in 10 litre of water for overnight

In the next morning stir the mixture with wooden plank till the solution become milky white

Filter and squeeze the content with double layer fine cloth

Make the volume to 100 litres by adding fresh water

Take 200 g of khadi soap, make the paste of it and add in the solution

Mix the solution thoroughly and use for spray

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Preparation of Agniastra

➤ Agniastra is a botanical formulation prepared by using neem leaves, chilli fruits, garlic and cow urine.

➤ It can be prepared instantly for the management of a variety of insect-pests



Preparation of Brahmastra

- It is a cow urine and botanicals based formulation used to manage **larger caterpillars** in the crop.



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Preparation of Chilli-Garlic-Extract

➤ As the name denotes, it is a chilli and garlic based formulation with cow urine, neem and besharam (*Ipomoea carnea*) leaves.



Hot chilli

Garlic

Neem leaves

Ipomoea
Or Bush M.
Glory

Cow Urin

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Application of Dashparni Extract

- Dashparni extract is useful to manage all kind of insect-pests of crops and orchards.
- Take 300ml of dashparni extract and dilute in tank containing 15 L of water (freshly prepared), 500ml/tank (3-4 months old), 1000ml/tank (5-6 months old)
- Spray 1000 L solution in 1ha crop or 2000 L in orchard

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Advantages of liquid biofertilizer

- Longer shelf life -12-24 months.
- No contamination.
- No loss of properties due to storage upto 45 °C.
- Greater potentials to fight with native population.
- High populations can be maintained more than 10^9 cells/ml upto 12 months to 24 months.
- Easy identification by typical fermented smell.
- Cost saving on carrier material, pulverization, neutralization, sterilization, packing and transport.





THANK YOU