BIO-INPUT RESOURCE CENTER

Natural Farming
Technical Process Manual

NATIONAL COALITION FOR NATURAL FARMING

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Finally, all this would not have been possible without the continuous guidance and mentorship of Ravindra A, Executive Director WASSAN and Dr Sabyasachi Das, Director RRA N.

Acknowledging that there is a lot more scope for additions be it in the processes laid out or the diversity of inputs; this is only the first version of the manual. We openly invite all to share additions and suggestions, thus beginning a continuous documentation process of agro-ecological input support systems.

Kuriakose Jr
Riya Rachel Simon

National Coalition for Natural Farming

Executive Summary

Agroecology is gaining ground in India and internationally. The broader principles of agroecology were laid out by FAO. The recent announcement by Prime Minister of India, Shri Narendra Modi, is further emphasizing on transforming the agriculture paradigm towards natural farming. Currently, India has more than a million farmers practicing agroecological farming but many of them struggle in sustaining it and subsequently are seen using synthetic fertilisers and chemical pesticides in the longer run.

Adopting natural farming practices and sustaining them poses many challenges for the farmers; particularly poor knowledge dissemination, increased efforts to procure raw materials, and lack of access to valued markets amongst others. Of which access to farm inputs can be cited due to the following reasons :

- Lack of exposure and knowledge of different bio-formulations and bio-inputs
- Unavailability of raw materials
- Lack of knowledge on handling, usage and storage of inputs
- Limited hand holding support
- Extra efforts required in procurement of the raw materials and their subsequent preparation
- Maintaining quality of the prepared bio-inputs

Bio-Resource Input Centers' (BRCs) are one of the possible input support systems that could help in resolving this issue of accessibility to natural farm inputs. Its promotion, as a single stop shop for all bio input needs will not only help farmers to learn but also adopt these technologies in their farm to sustain their livelihood and to make it professionally viable and profitable.

As the first version of the publication, the following pages, offers itself as a manual to set up such a center. Divided in three parts; the part 1 captures the enterprise aspects of the BRC. Laying out the center's objective; its desired audience, stakeholders and their respective roles; possible business models catering to diversity of economic demographics, and giving the outcomes that could be expected from the BRC.

While part 2 of the manual lays out the step by step process of setting up a BRC. Giving details of the physical infrastructure and equipment list required to set it up. Part 3 of the manual lays out details of the variety of products that could be sold in the center. The manual captures the biopesticides, biofertilizers, nutrient management, botanicals and non-botanicals based inputs. Details of the different inputs, its preparation, storage, required raw materials, and even the how and when these inputs could be used are mentioned. Thereby giving both the theoretical and practical aspects of the inputs.

Index

Part-I
Bio-Input Resource Center

Introduction

Part 1 :
Bio-Input Resource Center

Agro-ecology is gaining ground in India and internationally. The broader principles of agroecology were laid out by FAO. Niti Ayog has endorsed Natural Farming as one of the important directions for Indian agriculture; several programs at state and central levels (such as BPKP) are promoting natural farming. Currently, India has more than a million farmers practicing agroecological farming but many of them struggle in sustaining it and subsequently are seen using synthetic fertilizers and chemical pesticides in the longer run.
Adopting agroecology based farming practices and sustaining them poses many challenges for the farmers particularly ***poor knowledge dissemination, increased efforts to procure raw materials, and lack of access to valued markets amongst others.*** Of which access to farm inputs can be cited due to the following reasons :

- Lack of exposure and knowledge of different bio-formulations and bio-inputs
- Unavailability of raw materials
- Lack of knowledge on handling, usage and storage of inputs
- Limited hand holding support
- Extra efforts required in procurement of the raw materials and their subsequent preparation
- Maintaining quality of the prepared bio-inputs

Promotion of Bio Resource Centers, as a single stop shop for all organic input needs will not only help farmers to learn but also adopt these technologies in their farm to sustain their livelihood and to make it professionally viable and profitable.

Objectives

Part 1 :
Bio-Input Resource Center

A **Bio-Input Resource Centre (BRC)**, where time tested, locally prepared Inputs/formulations utilizing biological entities or biologically derived inputs useful for improving **soil health, crop growth, pest or disease management and habitat management** are made available for purchase by farmers in a defined geographical area.

The BRCs serve five purposes :

- Maintaining and sale of cultures of bio-fertilizers and bio-pesticides for multiplication and use by farmers
- Preparation and sale of ready-to-use organic inputs
- Training farmers on the preparations of botanical extracts and animal based inputs
- Sharing knowledge on natural farming practices
- Sale of pheromone traps, lures, sticky traps and others.

Audience group

BRCs are intended to be **for-profit enterprises run by individuals or groups who have expertise on Natural Farming**, a demo plot to demonstrate and some capital to invest. Their capacity building on recommended package of practices, production and handling of bioformulants, building a market and running a venture would be essential. **Natural Farmers or those interested in Natural Farming in the neighboring villages would be the ideal customers of BRCs.**

Certain prerequisites for potential BRC entrepreneurs

- Could be an SHG or a family
- 3 to 5 years Of Natural Farming experience
- Recognized as a progressive farmer in the village
- A demo plot for field visit
- Basic education to maintain data records and capture farmer feedback
- Potentially have a shed for production, storage and sales of bio-inputs (otherwise the capital expenses would be significantly higher) which is attached to their home or farm
- Financially sound enough to share the costs of setting up the BRC
- Should have access to cattle by products (either own or through village dairy)
- Good communication skills

Objectives

Part 1 :
Bio-Input Resource Center

The following support could be provided to BRC entrepreneurs from the project for BRC

- Capacity building - Technical trainings (PoPs of the local crops, production and handling of necessary bio-inputs, quality control)
- Support system setup (Access to resource organizations, other BRC entrepreneurs, knowledge documents, monthly Zoom sessions for a year)
- Exposure visit to other BRCs
- Establishing sources for procuring quality mother cultures, pheromone traps and other relevant inputs.
- Connections with microfinance institutions for loan
- Business model with a 3 year plan
- Refresher trainings

An example of the potential changes that may be visualized :

Crop	Item	Present Practice	Visualized Change in practice
Rice	Eco engineering	No specific practice	Gliricidia / Redgram on bunds
Rice	Soil fertility	FYM/Fertilizers	Green manure / Jeevamrut
Rice	Seed / Seedling treatment	No Practice	Pseudomonas /Azospirillum / Beejamrut
Rice	BPH / Leaf / folder/Stem borer	Imidacloprid / Dinoteferon	Ph traps / Botanicals / NSKE /Beauveria
Rice	Blast/Blight	Tricyclazole / Hexaconazole	Pseudomonas/Botanicals
Groundnut	Eco engineering	No specific practice	Pongamia/Neem for field borders
Groundnut	Soil fertility	FYM/Fertilizers	Ghana Jeevamrut
Groundnut	Seed / Soil treatment	M-45	Bijamrith, Trichoderma
Groundnut	Sucking pests	Imidacloprid / Mono	Sticky traps / NSKE / Verticillium
Groundnut	Leaf spot / stem rot	Saaf, Hexaconazole	Botanicals, Pseudomonas

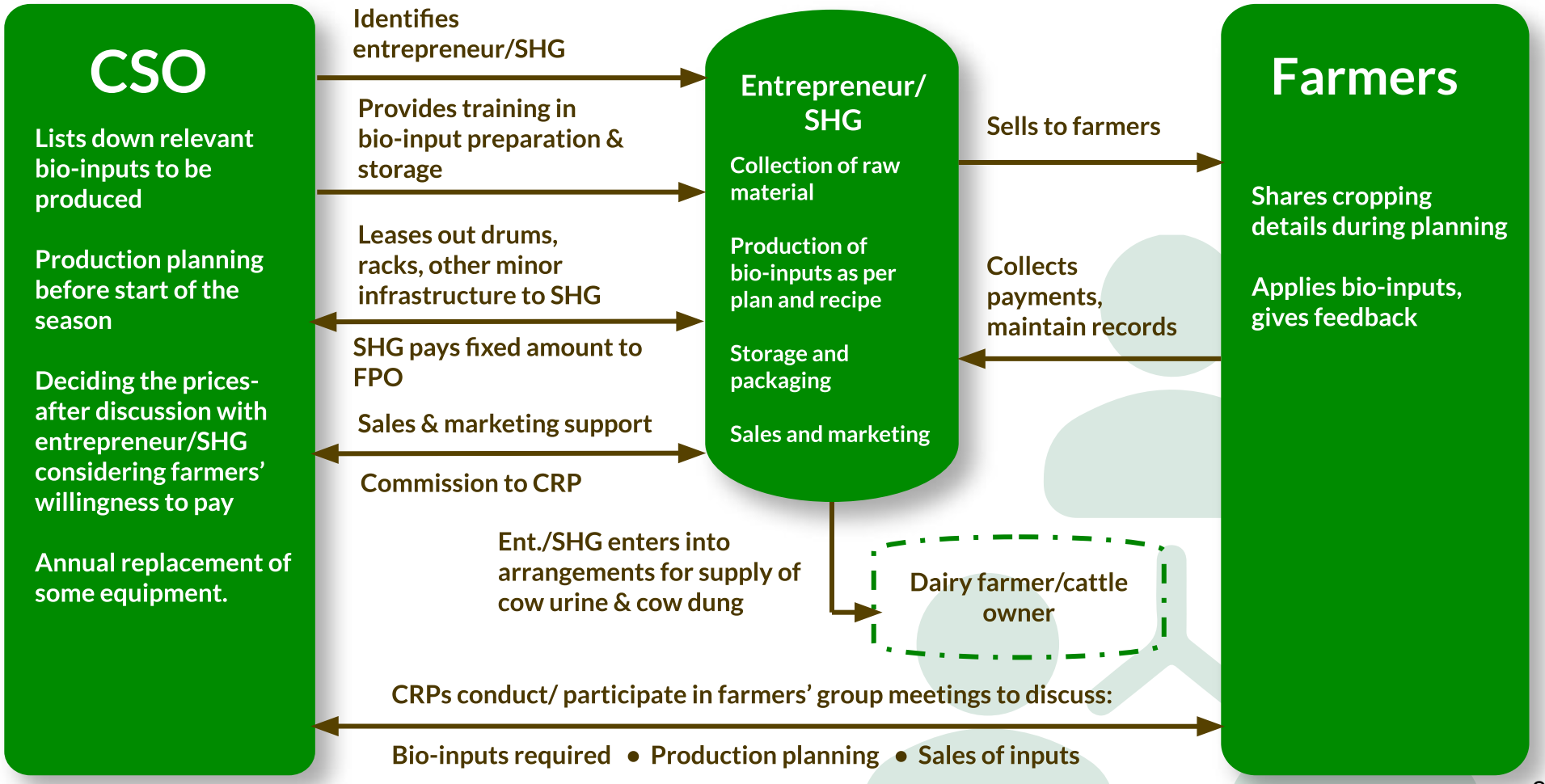
Possible role of CSO

- Prepare a 3 year business plan
- Selection of BRC entrepreneurs
- Sign MoU with BRC entrepreneurs
- Training of BRC entrepreneurs on technical and financial aspects of BRC
- Selection of Gram Panchayats
- Market Estimations
- Provide a grant (or a loan) for the capital expenditures (equipment and shed) of setting up BRC and a line of credit to the entrepreneur for handling operational expenses
- Extensive marketing support to the BRCs
- Sales support through CRPs or the field functionaries acting as commission agents. FPOs could directly sell the products
- Performance evaluation of BRCs
- Market assurance for six months to a year after initiating a BRC

Role of BRC entrepreneurs

- Maintaining and sale of cultures of bio fertilizers and bio pesticides for multiplication and use by farmers
- Preparation and sale of ready-to-use organic inputs
- Training farmers on the preparations of inputs
- Sale of other inputs pheromone traps, lures, sticky traps and others.
- Capturing farmer feedback
- Preparation of monthly accounts and share it with the CSO
- Invest a small amount for establishing and running the BRC

BIO-INPUT RESOURCE CENTER



Farmers

- Visiting BRCs for knowledge exchange and purchase of raw materials or ready-to-use inputs
- Share cropping details with the BRC entrepreneurs
- Provide feedback to the farmers after the use of the inputs

Others

Panchayats can play a very important role. They could support in providing land for BRC setup at extremely nominal rates. Their support could provide a big boost in the uptake of natural farming in the villages, thereby giving marketing support to the BRC.
Agriculture department (KVK, Block Development officers, Agriculture officers) can support largely in terms of providing access to various Govt schemes and technical training on various inputs amongst others.

Criteria for selection of Gram Panchayat

- CSO to be active in the panchayat for the next 3 years
- At Least 1000 farmers pursuing Natural farming or interested in it.

As a result of discussions two models have emerged with a lot of smaller variations. A ***low investment low income model (LIM)*** for tribal areas and the other could be a ***high investment high income model (HIM)***.

Low investment low income model (LIM)

- In the LIM model, a BRC entrepreneur gets a loan from an FPO at a 10% annual interest rate which is spent on capital expenses. It is assumed that the shed will be available with the BRC entrepreneur and only the equipment will have to be purchased. The duration of the loan is 3 years with annual EMI payments. It has been assumed that the equipment purchased would be depreciating assets with a life of 1 to 4 years. In the cost estimations, the packaging, branding and marketing costs have been estimated. The packaging and branding are extremely low cost versions. Labor costs have been considered, however it is recommended the family of the entrepreneur provide support in the production and sales thereby increasing the margins for the entrepreneur. Only 3 products are sold - Jeevamrut, Handikhata and Nimastra. The model also clearly shows that it is not a round the year kind of a work but seasonal work, in this particular case the May to November has been considered operational months. It will depend on the cropping seasons taken up in a particular region. It shows an estimated Profit and Loss statement with a growth trajectory for the first 3 years. It is a direct B2C model. Revenue through services has not been considered in this model. The cash flow indicates that a working capital of Rs 2132 is sufficient for the BRC to begin besides the support received from the FPO. Considering the low returns, LIM is more suited for individual champion farmers with support from their families and not SHGs.

High investment high income model HIM

- In the HIM model, largely the capital inflow comes as a grant from the CSO body helping the champion farmer or the SHG to set up the BRC. In this particular case, we are considering a mix of B2B and B2C models. It is assumed that land would be provided by the Panchayat or the SHG members free of cost. However, the construction of the shed and purchase of equipment have been accounted for. The equipment costs are significantly higher than the LIM models because of the increase in the range of products and inclusion of certain microbial cultures (azotobacter, trichoderma, verticillium) which need specialized equipment for production. It has been assumed that the equipment purchased would be depreciating assets with a life of 1 to 10 years and accordingly depreciation has been accounted for in the costs. Besides the inputs that are prepared and sold at the BRC, a service component has been included for inputs (Waste Decomposer, Jeewamrutham) that need to be prepared in bulk and transportation for the same would be extremely expensive, entrepreneurs will go to the farmers field to make such inputs and be paid a service fee for the same. Also the product list includes certain pheromone traps and sticky sheets which have to be procured and sold directly, NPM (non pesticidal management) techniques involve such methods. It has been assumed that 50% of the target area would be covered in the first year and all estimations have been made for the first year. On an average the margins have been kept at 50%, lower margins for products which are easy to prepare with a long shelf life or simply traded through the BRC (Pheromone traps). 10% commission has been assumed for the sales representatives (FPOs and field representatives of NGO). BRC entrepreneurs will need a loan of approximately 1L as working capital and will have to pay an interest for the same. Some products will remain unsold and subsequently there will be some losses. A target area of 1000 acres has been considered out of which only 30% would be captured in the first year and subsequently expansion would take place.

"Difference between LIM and HIM"

- Lead facilitating agency could be an FPO or a CSO
- BRC could be run by an SHG or a champion farmer. LIM is more suited for a champion farmer and HIM is more suited for an SHG
- Financial investments could be met through multiple channels - Loan or a grant from an NGO or an FPO, Government based grant could be a possibility, Panchayat support to meet some of the costs, the BRC entrepreneur could be making a small investment
- LIM is generally a B2B model, HIM could be B2B, B2C or a hybrid model
- Largely, the product and services selection is dependent on the cropping pattern and outlook of the farmers in the village. Services such as going to the farmer's home to make the inputs could also be a possibility. Paid training courses could also be conducted. Besides raw materials or ready to use inputs, other products could be sold such as seeds and seedlings. Matured BRCs could also be facilitating sales of end produce for the farmers.

Elaborate models OF both HIM and LIM can be shared upon request.

Steps to setup a BRC

Part 1 :
Bio-Input Resource Center

Step No.	Description	Remarks
1	Select BRC entrepreneurs	Criteria for selection of entrepreneurs has been shared as part of the
2	Selection of Panchayat / Target villages	Villages that can be catered through this BRC
3	Capacity Building of entrepreneurs on BRC	Capacity Building to cover technical guidance on inputs and farm practices as well as business model preparations
4	Selection of products to be sold	Select products whose demand is high or anticipated to be high
5	Finalise the prices of the products	Generally a 40% - 50% margin is suggested
6	Identifying reliable sources for mother culture of microbial inoculums	Inoculums like Verticillium, Pseudomonas, Azotobacter, PSB, KSB, others
7	Establish an investment plan (Capital Costs, Operational credit, Marketing costs, Buyback costs)	A small investment must come from the BRC entrepreneur as well
8	Create business model for each BRC	Soft copy of Sample Business model can be shared upon request
9	Exposure visit to other BRCs	-
10	Setup BRC shed(separate shed for production and storage)	One time expense, sometimes the shed is available with the entrepreneurs

Step No.	Tasklist	Remarks
11	Purchase of equipments	One time expense, approximate cost would be INR 60,000/-
12	Monitor quarterly accounts and performance evaluation	Soft copy of template to capture accounts can be shared upon request
13	Create a marketing model	How will the BRC products be marketed? Can it be through wall paintings or banners across villages? Or shall there be a one time activity of running a Public announcement system across the villages? Can regular messaging from entrepreneurs to potential customers help? Etc.
14	Create a sales model	Can the local FPOs, CRPs become sales agents?
15	Conduct marketing exercise across the target villages	Promotion of BRC products in all the target villages
16	Identify stakeholders and their roles	Can the local FPO, Panchayat, SHGs and other village level institutions support?
17	Buyback agreement with entrepreneurs for unsold products at cost to cost basis	A buyback agreement for the first 6 to 9 months till the monthly demand pattern is established
18	Q&A session with resource agency every month	Facilitate monthly session for entrepreneurs to engage with resource persons for support
19	Yearly quality tests of inputs	Will help in maintaining standards and may increase trust factor on the products being sold
20	Refresher training by sharing digital content with BRC entrepreneurs	

Expected Outcome

It is expected that the CSOs will open up new BRCs or upgrade existing BRCs that will leverage the experience of the existing BRCs.

Considering the fact that a BRC reduces the entry barrier to Natural Farming, increased uptake should be seen in the project areas since

- Effort required to practise Natural Farming will reduce
- Productivity of crops, vegetables, and fruit crops in the villages will improve
- Confidence levels of farmers with regard to use of organic and bio inputs will go up
- Quality of soil improved for future of agriculture
- The improved production levels of the village will pave a way to development of infrastructure facilities like Storage godowns, Market outlets etc.
- With increased family incomes, quality of life, family expenditure on education, health and amenities will improve
- Formation of commodity interest groups, FPOs may be possible that enables them for improved bargaining power, marketing and facilities.
- Few of the trained youth may assume the role of service providers in the domain of sustainable agriculture technology, provision of inputs, custom hiring and marketing etc.

Part-II
Setting up a BRC

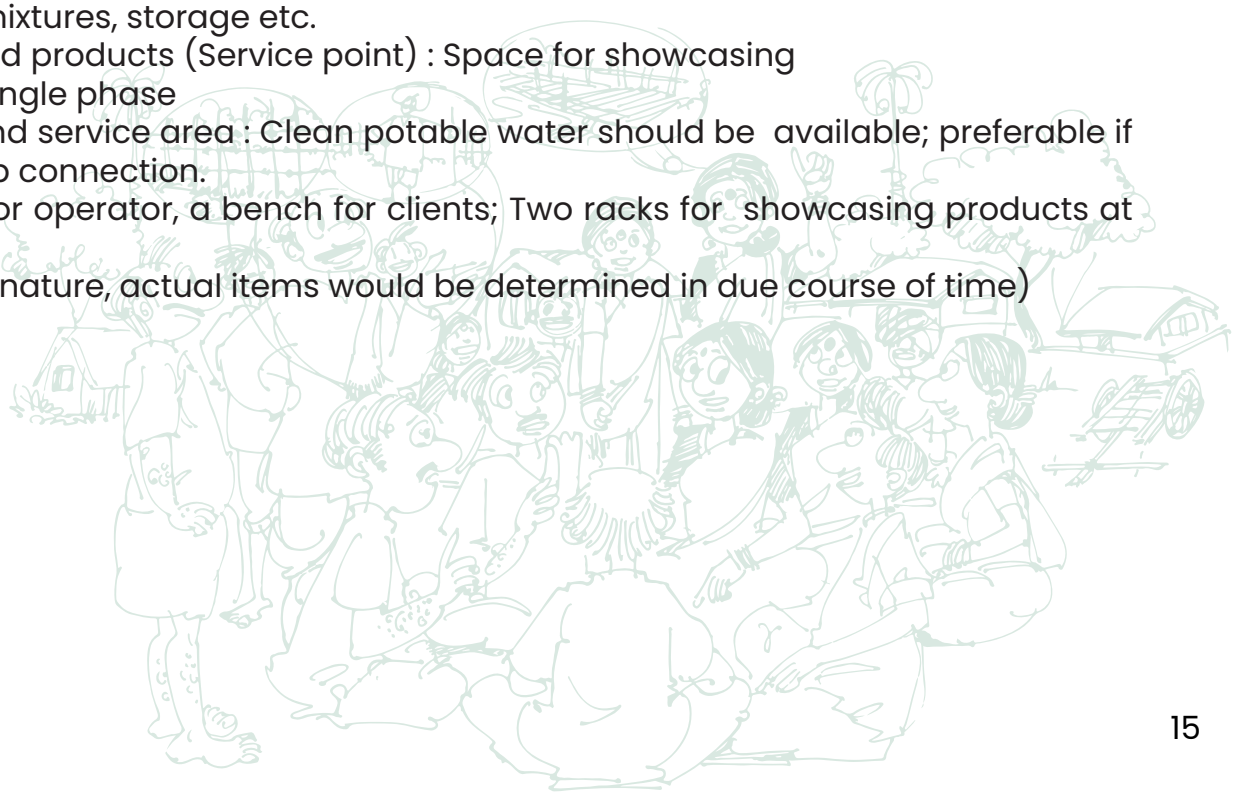
Equipment List

Sl.No	Item	QTY	Unit Cost (INR.)	Total Cost (INR.)
1	Plastic Drums 200 ltd	8	1,000	8,000
2	Plastic Drums 100 lt with lid	8	500	4,000
3	Gas Stove/Connection	1 set		7,000
4	Buckets and tubs	20	160	3,200
5	Cans 20 lt	10	350	3,500
6	Plastic drums 50 lt with tap and lid	10	500	5,000
7	Steel vessels big	5	800	4,000
8	Wet grinder	1		9,000
9	Plastic trays	12	150`x 12	1,800
10	PP covers & other packing material			1,000
11	Sealer	1		1,500
12	Racks	2	1,500	5,000
13	Tunnel shade net 100 sqm & Pro trays	Qs	2,500	6,000
14	Prestige Pressure cooker (20 lt)	1		5,000
15	Miscellaneous	Qs		5,000
	TOTAL			**69,000.00**

For establishing a BRC, the following Infrastructure and Equipments would be needed

Physical Infrastructure

- Working Area - Minimum of 5 cents of open space with entrepreneurs (Either owned/leased) for preliminary preparation of the raw materials, grading, washing, grinding etc. and a closed room (space) for housing of equipment, handling preparations, mixtures, storage etc.
- Room/Space for showcasing prepared products (Service point) : Space for showcasing
- Power connection at working area : Single phase
- Water facility both at working area and service area : Clean potable water should be available; preferable if it can have an overhead tank with tap connection.
- Furniture : At least 1 table and chair for operator, a bench for clients; Two racks for showcasing products at Service Centre.
- Plastic ware : (These are indicative in nature, actual items would be determined in due course of time)



Annexure II

Part 2 : BRC Inputs

The possible items in BRC could be

For Improving soil fertility and soil health

- Seeds of green manuring crops.
- Vermiculture / compost
- Neem / karanj cake
- Cow dung/cow urine
- Microbial preparations like Jeevamrut, Ghana Jeevamrith, Waste Decomposer, etc.
- Other inputs such as VAM, bv, Rhizobium, PSB, Azospirillum, Azotobacter, Potash / Zinc Mobilizers etc.

For habitat management:

- Seeds / Seedlings of Glyricidia, Drumstick, Pongam, Neem
- Seeds for Border crop/Intercrop/Cover crop.
- Navadhanya Seed Kits

For pest or disease management

- Seeds / seedlings of trap crops
- Botanical decoctions like Panchagavya, Dashparni, Neemastra, brahmastra, agniastra, NSKE
- Bio pesticides – Beauveria, Verticillium, Trichoderma, Pseudomonas, NPV formulations / cultures
- Pheromone traps, sticky traps, lights traps

Assumptions - The ingredient estimations, the cost estimations and various other details have been furnished to the best of our knowledge but it will vary across geographies.

1. Ghana Jeevamrutham

Prepration Time

1 week

Dosage

400 kg / acre

Usage

Should be incorporated into the field during the field preparation. Can also be broadcasted on the standing crop or at the base of perennials for 2-3 times in a season.

Preparation method

Spread the dung on the floor, spread urine, jaggery, flour and soil over the dung and mix thoroughly. Then make it in to small balls, dry them in shade. It should get dried in one week. After getting dried convert it in to powder, store in gunny bags.

Link of video

Tap the button

Remarks

It is not a fertilizer but it can enhance the micro-bial activity and convert all the nutrients in plant available form

Shelf life

6 months

Raw materials Required

- 100 kg cow dung
- 10 ltr cow urine
- 1kg to 2kg jaggery
- 1kg to 2kg pulse flour
- Handful of the best quality soil available (preferably from the base of an old tree or forest soil)

Estimated cost

- Jaggery Rs 120
- Flour Rs 140
- Urine Rs 50
- Cow Dung Rs 300

Total - Rs 610
(Rs 6 per kg)

How to store

Store it in a cool and dry place and moisture free area under a shade

Quality Assessment

-

Foliar Spray / Soil Application

Soil application

2. Type II-Ghana Jeevamrutham

Prepration Time

1 week

Dosage

400 kg / acre

Usage

Should be incorporated into the field during the field preparation and also can be broadcasted on the standing crop and also at the base of perennials for 2-3 times in a season.

Preparation method

Spread FYM on the floor, sprinkle 200L of jeevamrutham on it and mix it thoroughly. After 2-3 days, add another 200L of jeevamrutham. Mix it thoroughly and dry it in a shade.

Link of video

Tap the button

Remarks

It is not a fertilizer but it can enhance the microbial activity and convert the all nutrients in the available form

Raw materials Required

- 400 litre liquid jeevamrutham
- 1500 kg to 2000 kg FYM (a tractor load would be sufficient)

Shelf life

6 months

Estimated cost

- FYM Rs 3500
- Jeevamrutham Rs 1000

Total - Rs 3600 (Rs 2 per kg)

How to store

Store it in a cool and dry place and moisture free area under a shade

Quality Assessment

-

Foliar Spray / Soil Application

Soil application

2

3. Bio-Urea/Bio-soil:

Prepration Time

2- 3 months

Dosage

1000 kgs/Acre

Usage

Soil Fertility (Replace-ment for Chemical nitrogenous fertilisers)

Preparation method

Dig a pit in a size at least 5X5X5Foot (Dimensions), Fill the pit with the soil or with the sand and allow the all urine and washes from cattle shed to the pit contin-uously for 2-3 months, then drainage all the liquid composition and collect the soil from the pit and allow it to dry in shade and the bio-urea/ bio-soil will get ready for use.

Link of video

Remarks

It is not a fertilizer but it can enhance the microbial activity and convert the all nutrients in the avail-able form

Raw materials Required

A pit(Size as per Convenience)
Soil from pond/sandy soil to fill the pit
A cattle shed with lining to collect all washes into the pit

Shelf life

6 months to 1 year

Estimated cost

- FYM Rs 3500
- Jeevamrutham Rs 1000
Total - Rs 3600
(Rs 2 per kg)

Quality Assessment

-

Foliar Spray / Soil Application

Soil application

How to store

Can be store in shade for 1 year

4. Vermiwash

Prepration Time

7-10 days

Dosage

1000 kgs/Acre

Usage

It enhances the growth and resistance of the crop

Preparation method

Take aplastic can with eider mouth, drop-stones to ¼ part as an initial layter, and then arrange another layer as coconut coir to half of the container, and then arrange FYM as another layer, which is the topmost layer, and drop half KG of container, then pour a litre of water, allow the vessel to settle down for a week, but ensure moisture presence inside. After 1 week again pour 1 litre of wate and can obtain vermiwash from the bottom. This process of pouring water and collecting vermwash can be done 4-5 times.

Shelf life

6 months to 1 year

Raw materials Required

-Tank/Plastic can from 25 liters - 100 liters capaci-ty as per our convenience
- Stones
-Coconut coir
-FYM
-Water
-Earth worms

Estimated cost

Plastic can- 300rs

5. Beej Amrutham

Prepration Time

12 to 14 hours

Dosage

Sprinkle beej amrutham on seeds until all the seeds are wet, allow them to dry in the shade and then sow them in the field. Seedlings can be dipped in beej amrutham for 10 to 15 minutes before planting.

Usage

Treatment of seed and seedling with beej amrutham is helpful in better germination rates, helps in controlling the incidence of seed and soil borne disease

Preparation method

Take 20 liters of water in small bucket or tank and suspend cow dung in it over night by hanging into water in a cloth, pour cow urine,drop lime and soil into water allow for fermentation and can be used for next Day

Link of video

Remarks

Lime is using here to reduce the acidity in cow urine and beej amrutham cannot be mostly recommended for groundnut seed treatment.

Raw materials Required

- 5kgs of cow dung
- 5 liters of cow urine
- 50gm of lime powder in 20 liters of water
- Handful of the best quality soil available (preferably from the base of an old tree or soil from the forest)

Estimated cost

- Cow urine Rs 25
- Cow dung Rs 10
- Lime powder Rs 10

Total - Rs 45

Quality Assessment

Appearance of bubbles and using adequate quantity of ingredients during preparation

How to store

Cannot be stored

Foliar Spray / Soil Application

Seed coating

Shelf life

6 months to 1 year

6. Beejaraksha

Prepration Time

2 hours

Dosage

10 grams /kg of seed

Usage

Can be used for seed treatment especially for seeds having thin layer of seed coat eg: groundnut

Preparation method

All the ingredients should be converted into fine powder by using Mesh and sprinkle cow urine on the ingredients and mix the powder thoroughly and allow to dry in shade

Link of video

Tap the button

Remarks

Especially could be used for seed,having thin seed coat

Raw materials Required

-Red soil-100 grams
-Hill soil-100 grams
-Ash from sticks/Cow dung-100 grams
-Asafoetida powder-20 gms
-Turmeric powder-20 gms
-Cow urine-10 ml

Shelf life

6 months

Estimated cost

Asafoetida - Rs 50

How to store

Can be stored in small pots,or plastic vessels, see that beejaraskha should be stored in dry place

Quality Assessment

-

Foliar Spray / Soil Application

Seed coating

6

7. Jeevamrutha

Prepration Time

1 Days for preparation and allow 6 days for fermentation

Raw materials Required

-200 Liters of water
-2-5 Kgs cow dung
-5-10 Liters cow urine
-1 Kgs of jaggery
-1 Kgs of Pulse flower
-A Handful of chemical free soil

Dosage

- 1st spraying@15 days 100 liters water+5 liters DJ
- 2nd spraying@30 days 100 liters water+10 liters DJ
- 3rd spraying@45 days 100 liters water+15 liters DJ
- 4th spraying@60 days 100 liters water+20 liters DJ
- 5th spraying@75 days 100 liters water+25 liters DJ
- 6th spraying@ 90 days 100 liters water+ 30 liters DJ

after 6th spraying 30 liters for every 15 days can be recommended

Usage

Can be directly used with irrigation (ferti-gation) can also be use for sprayings with dilution,
used for growth and to increase soil fertility

Estimated cost

-Cow dung- Rs 30
-Cow urine- Rs 50
-Jaggery- Rs 60
-Flour- Rs 70
-Total- Rs 210

Preparation method

Pour 200 liters of water in a drum 1 kg of Jaggery, 1 kg of Flour, dung and urine, handful of chemical free soil in the drum and mix thoroughly

How to store

Plastic drums

Link of video

Tap the button

Quality Assessment

Appearing bubbles and
good smell of jaggery and floor

Foliar Spray / Soil Application

Both

Remarks

Microbial population will increase upto 7 days and will start reducing after 7 days as per scientific study See such that,Each and every part of the plant should be get wetten thoroughly

Shelf life

7 days from preparation

8. Neemastram

Prepration Time

1 Days for prepara-tion
and allow 2 days for Fermentation

Dosage

Should have to spray for every 20 days for better results and to avoid the incidence of all pests

Usage

Should be used directly without dilution.
Used for controlling sucking pest.

Preparation method

Pour 200 liters of water in a drum,cow dung and cow urine in it and allow the mixture to fermentate,

Link of video

Tap the button

Remarks

Uncertainty regarding shelf life but palekar said that can be stored upto 6 months
Each and every part of the plant should be get wetten thoroughly
Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-200 Liters of water
-5-10 Kgs of neem leaf paste
-2 Kgs of dung
-5 Liters of urine

Estimated cost

- Cow urine Rs 50

Quality Assessment

By physical appearance

How to store

Plastic drums

Foliar Spray / Soil Application

Foliar Spray

Shelf life

3 months

9. Vavilaku kashyam(vitex negundo solution)

Prepration Time

1 day- (3-5 hours)

Raw materials Required

-Vitex negundo leaves-5 kgs
-Surf-100 gm
-10 liters of water

Dosage

For effective results,it should be sprayed twice in 10 days effective results can obtain during initial stages of pest infestation, during the initial stages of crop (30-45 days-100 liters of diluted solution/acre) middle stages(60-90 days-150 liters of diluted solution) final stages(90-120 days- 200 liters of diluted solution)

Usage

Can be used for control of sucking pest,leaf curl diseases,to control the incidence of helicoverpa armigera

Estimated cost

-50 rs for boiling and grinding the leaves

Preparation method

Take 5 kgs of leaves paste and boiled in 10 liters of water, the solution should be boiled till the water shrinks to 5

Link of video

Tap the button

Quality Assessment

10 liters of liquid should be boiled until it becomes to 5 liters

Foliar Spray / Soil Application

Foliar Spray

Remarks

Each and every part of the plant should be get wetten thoroughly

How to store

Cannot be stored

Shelf life

0 days

10. Agnastram

Prepration Time

Required only one day(3-5 hours) of doing all activities but it should be kept aside for 48 hours after preparation

Dosage

For Effective results, we have have apply this bio insecticides when infestation is at Economic threshold level, This is the powerful coconction which can control all most of all pests, (3-5 liters of Agnastram into 100 liters of water and can be applied for 1 acre)

Usage

It can be used for all types of stem borers, fruit borers, hidden caterpillars, pod borers and all kinds of bollworms

Preparation method

Take 20 liters of cow urine into a pot and place all ingredients in to the pot and allow to boil it for 1 hour on small flame and allow to cool it for 48 hours and stir it in the morning and evening

Link of video

Tap the button

Remarks

High dosage may cause damage to the crop Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-20 liters of cow urine
-2-5 kgs of neem leaves paste
-1/2 kgs of Tobacco powder
-1-2 kg of chilli paste
-1/2 kg of garlic paste
-Pot for boiling

Estimated cost

-Cow urine - Rs 50
-Neem leaves paste - Rs 50,
-Garlic paste - Rs 60
-Chilli paste - Rs 100
-Tobbaco powder - Rs 60
- Total - RS 320

How to store

Filter the liquid Can be stored in pots upto 3 months

Quality Assessment

Use exact ingredients and follow procedure to get effective Results

Foliar Spray / Soil Application

Foliar Spray

Shelf life

3 months

11. Brahmastram

Prepration Time

Required only one day(3-5 hours) of doing all activities but it should be kept aside for 48 hours after preparation

Dosage

For Effective results, we have have apply this bio insecticides when infestation is at Economic threshold level, This is the coconction which can control all sucking pest and small bollworms,(6-8 liters of Brahmastram into 200 liters of water and can be applied for 1 acre)

Usage

To control all types of Bollworms and all types of sucking pest

Preparation method

Take 20 liters of cow urine into a pot and place all ingredients in to the pot and allow to boil it for 1 hour on small flame and allow to cool it for 48 hours and stir it in the morn-ing and evening

Link of video

Tap the button

Remarks

Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-20 liters of cow urine
-2 kg of Neem leaves pulp
-2 kg pongamia leaves
-2 kg custard apple leaves pulp
-2kg datura leaves pulp
-2kg castor leaves pulp

Estimated cost

-Cow urine - Rs 50
-Neem,pongamia,-custard apple,datura Castor leaves into paste/pulp -Rs 50

- Total - Rs 100

How to store

filter the liquid Can be stored in pots upto 3 months

Quality Assessment

use exact ingredients and follow procedure to get effective Results

Foliar Spray / Soil Application

Foliar Spray

Shelf life

6 months

12. Dashparni kashayam

Prepration Time

40 days to complete the process of preparation

Dosage

For Effective results, we have have apply this bio insecticides when infestation is at Economic threshold level, This is the powerful coconction which can control all most of all pests, (3-5 liters of Agnastram into 100 liters of water and can be applied for 1 acre)

Usage

To control all types of pest

Preparation method

Take 200 liters of water and drop 20 liters cow urine and 2 kgs of cow dung into the drum and cover it with gunny bag and keep it a side for 2 hours and after 2 hours add 500 grams of turmeric powder and 500 gms of ginger pulp and 10 gm of asafoetida and mix it thoroughly and allow it for fermentation over the night,in the next day morning add 1 kg of tobacco powder,2 kg of hot green chilli pulp and add half kg of garlic pulp and keep it in the shade for 24 hours in the next morning add all the 10 kinds of leaves and allow it for fermentation for 30-40 days,avoid to interact directly with sunlight and water,after 30 -40 days we have to filter this with cloth and can be stored for 6 months

Link of video

Tap the button

Remarks

Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-200 liters drum
-20 liters of cow urine
-2 kgs of cow dung
-500 gms of turmeric powder
-500 gms of ginger paste
-10 gms of asafoetida
-1 to 2 kgs of chillies
-Half kg of garlic solution
-1 kg of tobacco powder
- 2Kgs of neem leaves
-2kg of pongamia leaves,
-2kgs of Datura leaves
-2 kgs custard apple leaves
-2kgs of Bael leaves
-2 kgs of tulasi leaves
-2 kgs pieces of mari-gold plant
-2kgs of rui leaves
-2kgs of mango leaves
-2kgs of guava leaves
-2 kgs of papaya leaves
-2 kgs of pomegranate
-2kgs of Vitex bendigo leaves
2kgs of lantana camara
2 kgs of ginger leaves
2 kgs of Hibiscus leaves
2 kgs of ber leaves
2 kgs of Cassia tora leaves

Estimated cost

-Cow Urine Rs.50
-Ginger-500gms- Rs60
-Asafoetida - Rs.30
-Tobacco Powder -Rs 100
-chillies-Rs 100
-Garlic-Rs 80
-Collecting and crushing leaves - Rs.150
Total Rs. 570/-

Quality Assessment

Use the quantity of Raw material as per recommendation and allow for the fermentation as per schedule which was recommended

Shelf life

3 months

How to store

Plastic drums

Foliar Spray / Soil Application

Foliar Spray

13. Panchagavya

Prepration Time

Requires 21 days to complete the process of preparation

Dosage

3 Liters/Acre

Usage

It can be useful to enhance the Flowering and fruit growth and also vigorous growth of the crop

Preparation method

Take 5 kgs of dung in to small tub and mix it thoroughly with ghee,do it for 4 days in the morning and evening, After the 4 days mix all other ingredients such as the milk, urine, coconut water, palm wine, jaggery into it and mix it thoroughly and store it by covering with cloth and allow it to fermentate for 15 Days.., then the solution ready for usage

Link of video

Tap the button

Remarks

Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-Cow dung - 5kgs
-Cow urine- 3 liters
-Cow's curd- 2 liters
-Cow milk- 3 liters
-Cow ghee-3 Liters
-Coconut water-3 Liters
-Bananas-12
-water-3 liters
-Jaggery-1KG
-Palm wine-3 liters

Shelf life

6 months to 1 year

Estimated cost

-Cow milk- Rs 180
-Cow Curd- Rs 120
-Cow ghee- Rs 500
-Coconut water- Rs180
-Bananas- Rs 60
-Jaggery - Rs 60
Total - Rs 1100

Quality Assessment

-

Foliar Spray / Soil Application

Foliar Spray

How to store

store in the plastic drum or in a pot

14. Saptha Dhanyakura Kashayam:

Prepration Time

2 days

Dosage

Obtained 10-15 liters of liquid into 100 liters of water and can be sprayed

Usage

To control the flower and fruit droppings,to increase the quality of the produce

Preparation method

Take all 6 types of dhanteras in 1 bowl and sesame dhanya in another bowl pour water allow it to get soaked for 12 hours and next to that tie these dhanya's in two different cloths as they soaked and allow they to keep in shade for 12-24 hours we can observe the sprout-ings from the seed,we should have to grind the all types of dhan-ya's at a time and deposit such mixture into the 10 liters of urine and add the entire content into 100 liters of water and can be used for 1 acre

Link of video

Tap the button

Remarks

Each and every part of the plant should be get wetten thoroughly

Raw materials Required

-100 gm sesame
-100 gm Red gram
-100 gm Red gram
-100 gm Bengal gram
-100 gram Horse gram
-100 Black gram
-100 Dhaincha

Estimated cost

-7 dhanyas -Rs 100

How to store

Store in the plastic drum or in a pot

Quality Assessment

-

Foliar Spray / Soil Application

Foliar Spray

Shelf life

2 days

15.Sour Butter milk

Prepration Time

3-4 days

Dosage

20 DAS(Days after sowing) -6 liters of sour buttermilk in 100 liters of water

Usage

To control the fungal infection

Preparation method

Take 2-3 liters of milk and make it into curd and convert that curd into buttermilk and allow it fermentate for 4-6 days

Link of video

Tap the button

Remarks

Each and every part of the plant should be sprayed thoroughly,It can be also applied for the soil along with water

Raw materials Required

Buttermilk

Shelf life

No shelf life

Estimated cost

- Milk 2 liters- Rs 120

How to store

cannot be stored

Quality Assessment

-

Foliar Spray / Soil Application

Both

15

16. Cow dung asafoetida solution

Prepration Time

4 days

Dosage

3ltr per acre

Usage

it will provide some resistant to crop to survive against the drought, It can able to prevent upward leaf curl in chilli and other crops

Preparation method

Mix cow dung cow urine and water, in a drum and keep it for fermentation for 4 days. Stir it well morning and evening in these four days. Then add asafoetida and lime to the solution and mix it thoroughly. Keep it aside for sedimentation and then filter the liquid out using a cloth

Link of video

Tap the button

Remarks

Each and every part of the plant should be sprayed thoroughly

Raw materials Required

-Cow dung 5 kg
-Cow urine 5 ltr
-Lime- 150grm
-Asafoetida 200 gms

Shelf life

No shelf life

Estimated cost

-Cow urine - Rs 50
-Asafoiteda - Rs 75
-Total - Rs 125

How to store

Cannot be stored

Quality Assessment

-

Foliar Spray / Soil Application

Foliar Spray

16

17. Waste decomposer

Prepration Time

4- 6 days

Dosage

Fertigation- providing along with irrigation
-First 15-20 days after sowing take a drum fill 25% with waste decomposer rest 75% with water mix it well and spray it
- From 40-50 days 50% waste decom-poser and 50% water mix it well and spray it.
- From 65-70 days 75% of drum decom-poser and 25% water and spray it
- From 85-90 days 100 % WDC

Usage

Enhances soil fertility
breaks the soil salinity
enhances the growth of crop
controls diseases and pest to an extend

Preparation method

Take 200 ltr drum, pour 200 ltr of water add 2 kg jaggery and add mother culture mix it well.

Link of video

Tap the button

Remarks

It can be prepared again and again by keeping 30-40 liters of WDC as mother culture in 200 liters of drum and fill the drum again with water and 2 Kgs of jaggery,then we can prepare 200 liters of jeevamrutham

Raw materials Required

-WDC mother culture
-200 Liter of water
-2 kg Jaggery

Estimated cost

-2 kgs Jaggery - Rs 140
Mother culture -Rs 20
-Total - Rs 160

Shelf life

2 years

Quality Assessment

-

Foliar Spray / Soil Application

Both

How to store

Plastic drums

18.Amruthajalam:

Prepration Time

3 Days

Dosage

Fertigation- The whole 200 ltrs can provided along with irrigation

Usage

It provides NPK to crops
it can enhance the growth of the crop and will gives the

Preparation method

In 200 litres of water mix all the mentioned ingredients then allow it for fermentation for three days

Link of video

Tap the button

Remarks

It is not a fertilizer but it can enhance the microbial activity and convert the all nutrients in the available form

Raw materials Required

-10 ltr cow urine
-2 kg cow dung
-15 kg of neem powder
-400gm sesame oil
-2 kg of jaggery
-2kg pulse floor
-200 litres of water

Estimated cost

-Neem powder - Rs 300
-Sesame oil -Rs 80
-Jaggery - Rs 120
-Pulse flour - Rs 140
Total - Rs 640

How to store

Store it in a cool and dry place and moisture free area under a shade

Quality Assessment

-

Foliar Spray / Soil Application

Soil application

Shelf life

1 week

19. Neem seed kernel Extract:

Prepration Time

1 day

Dosage

3 litres/acre

Usage

For Controlling of small bollworms and sucking pest

Preparation method

Soak neem seed kernel powder in 20 litres of water using a cotton cloth for one night. Remove the cloth next day and add the soap nut powder to it and mix it thoroughly, the solution gets prepared

Link of video

Tap the button

Remarks

-

Raw materials Required

-5kg Neem seed kernel
-20 litres - water
-Soapnut powder 100gm

Shelf life

No shelf life

Estimated cost

-Neem seed- Rs 100
-Soapnut - Rs 50

-Total - Rs 150

How to store

Cannot be stored

Quality Assessment

-

Foliar Spray / Soil Application

Foliar spray

19

20.Bael Leaves kashayam

Prepration Time

1 day

Dosage

5 lts of kashayam poured into the 100 liters of water and can be sprayed on the crop

Usage

It can be used efficiently to control the blast of Rice with in a week should be sprayed 2 times for effective results

Preparation method

Take a pot and pour 10 liters of water into pot and drop these 5 kgs of bael in the pot and boil on the small flame until the liquid comes to 5 liters then allow the liquid to get cool,then the kashayam is ready for the use

Link of video

Tap the button

Remarks

It is not a fertilizer but it can enhance the microbial activity and convert the all nutrients in the available form

Raw materials Required

-5 kgs of bael leaves
-Soap powder-100 gms/
-Soap nut powder -500gms

Shelf life

No shelf life

How to store

Cannot be stored

Quality Assessment

-

Foliar Spray / Soil Application

Soil application

20

21.Onion kashayam:

Prepration Time

3 days

Dosage

Obtained liquid is to be poured in 100 liters of water and should be sprayed on the crop

Usage

for controlling the white and yellow flies and Red mites effectively

Preparation method

Take 5 kgs of onion and grind it into paste and take a pot and pour 20 liters of water and deposit this onion paste into that,allow it to fermentate for 48 hrs and then filter the liquid after 48 hours,then deposit all ingredients which were mentioned and mix it with 200 liters of water and can be sprayed

Link of video

Tap the button

Remarks

Effective for controlling the red mites

Raw materials Required

-Onion-5 kgs
-Jaggery -2 Kgs
-Coconut water-2 liters
-100 gms turmeric powder

Estimated cost

-Onion -250Rs
-Jaggery-120 Rs
-Coconut water-200 Rs
- Total-570 Rs

Quality Assessment

-

How to store

Cannot be stored

Foliar Spray / Soil Application

Seed coating

Shelf life

No shelf life

22.Tobacco Kashayam

Prepration Time

1 days

Dosage

Obtained liquid is to be poured in 100 liters of water and should be sprayed on the crop

Usage

For controlling of sucking pests, larvae

Preparation method

Take 1 kg of Tobacco paste and 10 liters of water into a pot and boil it
and Add surf powder to it before spraying

Link of video

Tap the button

Remarks

Tie cloth to the mouth and nose while boilingIt can be used 1-2 times in 5-7 days,then after spray jeevamrutham/cow dung asafoetida solution for better results

Raw materials Required

-Tobacco leaves-1kg
-Surf powder -100gm
or Soap Nut powder

Shelf life

6 months

Quality Assessment

-

Estimated cost

Tobacco paste-50Rs

How to store

Cannot be stored

Foliar Spray / Soil Application

Foliar spray

22

23.Thutikada Kashayam(ipomea solution)

Prepration Time

1 days

Dosage

Obtained liquid is to be poured in 100 liters of water and should be sprayed on the crop

Usage

For effective control of Brown plant Hopper

Preparation method

Cut the ipomea leaves in to small pieces, Boil this ipomea leaves in 15 liters of cow urine, by using the pot until 4 boils and allow to cool it down then filter the liquid by using the cotton cloth and can be used

Link of video

Tap the button

Remarks

Tie cloth to the mouth and nose while boiling Effective for controlling the red mites

Raw materials Required

-10 kgs ipomea leaves
-15 liters desi cow urine

Estimated cost

-Cow dung- Rs 30
-Cow urine- Rs 50
-Jaggery- Rs 60
-Flour- Rs 70
-Total- Rs 210

Quality Assessment

Appearing bubbles and good smell of jaggery and floor

How to store

Cannot be stored

Foliar Spray / Soil Application

Foliar spray

Shelf life

No shelf life

25.Green Chilli Garlic Solution

Prepration Time

5 days

Dosage

3-5 ml/liter

Usage

For fungal infections and for leaf spots

Preparation method

Take 1 liter of water which is obtained after washing the rice And store it a side for 2 days in a liter or 2 liter bottle And after these 2 days pour 3 liters of milk into this starch water Allow the solution for fermenta-tion for 3 days By covering it with some cotton cloth Three layers will be formed after 3 days The above 2 layers which are thick should removed and the 3rd layer which is thin we can use it We can use this solution for controlling of all fungal infections and to enhance the flowering and fruiting . Dosage 3-5ml of liquid with 1 liter of water

Link of video

Tap the button

Raw materials Required

-Rice starch (water obtained after washing the Rice)
-3 Liters of raw cow milk,
-Jaggery for storage
-Small plastic drum

Shelf life

2 years

Estimated cost

3 liters milk-180Rs

How to store

For storage add liquid jaggery to the solution which is equal to quantity of the solution(LAB) and should stored in fridge

Quality Assessment

Foliar Spray / Soil Application

Foliar spray

26.Egg amino acid

Prepration Time

27 days

Dosage

50 mL /15 liters of sprayer(taiwan sprayer)

Usage

use for vigorous growth and provide resistant to the plant and can able to control the many pest

Preparation method

Take a small plastic tin and deposit black jaggery and eggs and cut the lemon into 2 pieces and deposit in the plastic tin and close the tin with cap and shake morning and evening thoroughly, After 27 days the solution will get ready

How to store

Plastic tin/jar

Raw materials Required

-1 kg jaggery
-12 Desi eggs
-30 lemons

Shelf life

6 months

Estimated cost

-1 kg jaggery- Rs 60
-12 desi eggs- Rs 120
-30 lemons -Rs 150
-Total - Rs 330

Foliar Spray / Soil Application

Foliar Spray

26

27.Ocimum kashayam

Prepration Time

1 day

Dosage

5 liters/acre

Usage

For controlling of alternaria leaf spot and some other fungal diseases

Preparation method

Take a Pot and pour 10 liters of water into it and add 5 kgs of Ocimum leaves and boil it till comes to 5 liters of liquid and allow it to cool down and can be diluted and sprayed for 1 acre of land

Link of video

Tap the button

Remarks

For effective results Spray twice in a week

Raw materials Required

-5kgs Ocimum
-10 liters of water
-100 gms soap powder

Shelf life

2-3 days

Estimated cost

-Cow urine - Rs 50
-Neem leaves paste - Rs 50,
-Garlic paste - Rs 60
-Chilli paste - Rs 100
-Tobbaco powder - Rs 60
- Total - RS 320

Quality Assessment

Use exact ingredients and follow procedure to get effective Results

How to store

Cannot be stored

Foliar Spray / Soil Application

Foliar Spray

28.Herbal Tea

Prepration Time

7 Days

Dosage

Obtained liquid to be diluted in 200 liters of water.

Usage

It will be useful for controlling of many pests and control of many leaf spots and it will enhances the growth of the crop it can be mostly used in all most all types of vegetable crops

Preparation method

Grinde 5 types of leaves and make it as a paste. Add 5 liters of cow urine,5kgs of cow dung in a pot and add these 5 types of leaves paste into it Stir it every morning and evening thoroughly for 7 days,add 5 liters of water to it and filter the liquid,then herbal tea is ready for use

Link of video

Tap the button

Shelf life

0 days

Raw materials Required

-Ocimum-1kg
-Tobacco leaves-1 kg
-Papaya leaves-1kg
-Aloe Vera leaves-1kg
-Bougainvillea leaves-1kg
-Teak wood tree leaves-1kg
-Neem leaves-1kg
-5 kgs cow dung
-5 liters of cow urine
-5 liters Neem leaves
-100 grams jaggery

How to store

Cannot be stored

Foliar Spray / Soil Application

Foliar Spray

29.Fish Amino acid

Prepration Time

27 days

Dosage

Obtained liquid to be diluted in 200 liters of water.

Usage

It can gives the vigours growth of the plant

Preparation method

Take a small plastic tin and deposit black jaggery and add 1 kg of fish and 1 liter of water to it close the tin with cap and shake morning and evening thoroughly, allow it to fermentate After 27 days the solution will get ready

Link of video

Tap the button

Remarks

Raw materials Required

-1 kg of jaggery
-Fishes and fish wastes 1 kg
-1 liter water

Estimated cost

-Jaggery - 60 Rs
-Fish -100Rs
-Total -160Rs

Foliar Spray / Soil Application

Foliar Spray

Shelf life

6 months

How to store

Plastic tin/jar

29

30.Dried ginger(Sonti/sonth)-milk Kashayam

Prepration Time

3 hours

Dosage

Obtained liquid to be diluted in 200 liters of water.

Usage

All types of diseases

Preparation method

Make sonti into fine powder and deposit in 2 liters of water and boil it thoroughly until the liquid comes to 1 liter At the same time boil the milk upto one boil and allow them to cool down and then mix the both liquids together and can be used for spraying by diluting in 200 liters of water

Link of video

Tap the button

Foliar Spray / Soil Application

Foliar Spray

Raw materials Required

-Sonti-200 grams
-Water-2 liters
-Cow or Buffalo milk-5 liter

Shelf life

No shelf life

Estimated cost

-Sonti Rs 50
-Milk-5 liters-300 Rs
-Total -350Rs

How to store

Cannot be stored

30

31. Cow Pat Pit (CPP)

Prepration Time

30 days

Dosage

1 Kg CPP 40 Lit of water for 2 acre 1 Kg CPP in 5 Lit of water, dip the roots of the plant before planting

Usage

Nourish the new roots , while doing seed treatment Help to heal wounded plants

Preparation method

Dig a 3ft x 2 ft x 1ft deep pit, layer the boundary with wet bricks. The pit should be empty on its lower surface. Collect 60 to 65 Kg of cow dung from healthy milk giving cows (if possible) , add 200gms of eggshell powder or seashell powder and 200gms of powdered basalt or rockdust. Knead this mixture for 10 mins. Fill the kneaded cow dung mixture upto 10 inches. After the mixture is settled, make sure to punch 5 holes of 2 inches. Add 2 sets of B.D 502-506 in the punched holes and cover them up with Organic Fertilizers. Add 350 ml of B.D 507 in clean water and sprinkle it all over the pit evenly and cover it with a wet jute bag. After a month passes on, stir it after each 15 days

Link of video

Tap the button

Shelf life

6 months

Raw materials Required

Cow dung- 60-65 Kg
Egg Shell powder - 200g
Two sets of bio dynamic prescription

Estimated cost

How to store

Pit

31

32. Plant growth Factor Soyabean Tonic

Prepration Time

30 Day

Shelf life

6 months

Usage

250gm to 500gm of fluid when mixed with 16 liters of water and sprinkled occasion-ally helps in healthy growth of flowers & fruits. When mixed with irrigation water (5 to 7 liters per Acre) helps in land fertility and growth.

How to store

Pit

Link of video

Tap the button

Raw materials Required

1 KG Soybean Seeds
250gm of Mahua Flower
Half Kg Jaggery
6 Bananas
250 gms of Drum-stick leaves
1 Kg Marigold Flower
10 Liters of water

32

Non Botanicals

Nutrient Management | Multiplication Process

1. Azotobacter (Free Living)

Nutrient fixed

Nitrogen

Type

Bacteria

Raw materials Required

Mother culture (liquid or powder), FYM

Crops

vegetable seeds, wheat, Maize, Mustard, cotton, potato etc.

Usage Seed Treatment

Seed Treatment - It can be used in seed treatment to most of the cereals,Especially used in the seed treatment of all vege-tables,10-20 gms of Azotobacter to be used in 1 kg of seed treatment. In case of liquid biofertilizer,For seed treatment 250 ml of azotobacter to be mixed 2-3 liters of water and spread and mix thoroughly with 50-60 kgs of seeds and allow them to dry and to be sown immediately,In the case of seedling treatment, 250 ml of liquid to be mixed with 4-5 liters of water and soak the seedlings for half an hour and sow immediately,

Usage Soil application

Soil application - 1-2 Kgs of Azotobacter can be mixed with 100 kgs of FYM and mix it thoroughly for 2-5 days,give little mois-ture to the content daily,the white colour appearance seems on the FYM which was mixed, it the symbolic representation,that mixed FYM is ready for use In case of liquid biofertiliser, 500 ml of liquid azotobacter to be mixed with 100 kgs of FYM and spread it throughout the field

Dosage

10 gm of azoto-bacter for 1 kg of seed
1-2 kg/ 500ml of azotobacter to be mixed with 100 kgs of FYM

Mother culture cost

100 Rs/KG
120 Rs/Liter

Shelf life

3 months

2. Azospirillum

Nutrient fixed

Nitrogen

Type

Bacteria

Raw materials Required

Azospirillum culture-1-2 kgs
FYM-100 kgs

Crops

Mostly used in Sorghum,Paddy,-sugarcane,Millets etc

Usage Seed Treatment

250ML of azotobacter to be mixed 2-3 liters of water and spread and mix thoroughly with 50-60 kgs of seeds and allow them to dry and to be sown immediately,In the case of seedling treatment, 250 ml of liquid to be mixed with 4-5 liters of water and soak the seed-lings for half an hour and sow immediately,
soil application :500-750' ml of liquid azospirillum to be mixed with 100 kgs of FYM and spread it throughout the field.If it is powder form- 1-2 Kgs of Azospirillum can be mixed with 100 kgs of FYM and mix it thoroughly for 2-5 days,give little moisture to the content daily,the white colour appearance seems on the FYM which was mixed, it the symbolic representa-tion,that mixed FYM is ready for use

Dosage

Seed treatment-Half Kg of Azospirillum is mixed with the stretch of paddy and sprinkled on sprouted paddy seeds and mix it thoroughly and for seedling treatment half kg azospirillum is mixed with 4-5 liters of water and soak the seedlings for half an hour and can be sown

Mother culture cost

100 Rs/KG
120 Rs/Liter

Shelf life

3 months

3. Rhizobium

Nutrient fixed

Nitrogen

Type

Bacteria

Usage

Jaggery syrup is made by boiling it,and add 500 -800gm of Rhizobium culture is to be mixed with jaggery solution and sprinkle over the seeds such that ensure small coating over the seed (Jaggery syrup and Mother culture should be mixed as per the size of the seed) It fixes the nitrogen into the soil due to the presence of leghaemo-globin

Dosage

200 gms for 10-15kgs of seed

Mother culture cost

100 Rs/KG
120 Rs/Liter

Raw materials Required

Rhizobium culture and Jaggery

Crops

All pulses except kidney beans (kidney beans do not fix nitrogen in the soil)

Shelf life

3 months

4. PSB (Phosphate solubilising Bacteria)

Nutrient fixed

Phosphorus

Type

Bacteria

Usage

It can solubilize the phosphorous present the soil and supplies to the plants in available form.

Dosage

Soil Application :500-700ml of PSB to mixed with 100kgs of FYM and give moisture to the mixed FYM for 5 days then white colour appearance was developed above the surface of the FYM,which indicates that substance is ready for use

Mother culture cost

120 Rs/Liter

Raw materials Required

PSB culture
FYM

Crops

All crops

Shelf life

3 months

5. VAM (vesicular Arbuscular Mycorrhiza)

Nutrient fixed	Type	Usage	Dosage	Mother culture cost
Phosphorus	Bacteria	It can solubilize the phosphorous present the soil and supplies to the plants in available form and promotion of growth as much as possible	Soil Application :500-700ml of VAM to mixed with 100kgs of FYM and give moisture to the mixed FYM for 5 days then white colour appearance was developed above the surface of the FYM,which indicates that substance is ready for use	120 Rs/Liter

Crops
All crops

5. KSB (Pottsium solubilising bacteria)

Nutrient fixed	Type	Usage	Dosage
Potassium	Bacteria	It solubilizes the potassium present in the soil,	Soil Application :500-700ml of VAM to mixed with 100kgs of FYM and give moisture to the mixed FYM for 5 days then white colour appearance was developed above the surface of the FYM,which indicates that substance is ready for use

7. ZSB (Zinc solubilising Bacteria)

Nutrient fixed	Type	Usage	Dosage
Zinc	Bacteria	It solubilizes the zinc present in the soil and provides to plants in required form	Soil Application :500-700ml of VAM to mixed with 100kgs of FYM and give moisture to the mixed FYM for 5 days then white colour appearance was developed above the surface of the FYM,which indicates that substance is ready for use

8. Trichoderma Viridae

Nutrient fixed

NA

Type

Bacteria

Crops

All crops

Usage

It can be used for controlling of all types of fungal diseases,It can control root rot,Bulb rot and can control the all kinds of fungal diseases and it can control the wilt in chilli and tomato if given as the fertigation can be mixed with FYM and can incorporate during the last ploughings can also be used as foliar spray

Dosage

Seed treatment :10 gms/1 kg of seed In case of tubers,bulbs and suckers,1 kg of T viride should be deposited in 100 liters of water and soak them for half an hour and can be sown/Planted soil Application: 100kgs of FYM mixed with 2 kgs of Tviridae can be incorporated into the field Foliar Spray : 3-5 gms/3-5 ml per 1 liter of water

Mother culture cost

100-120 Rs/kg

Shelf life

3 months

9. Pseudomonas

Nutrient fixed

NA

Type

Bacteria

Crops

All crops

Usage

It can be used for the control of all types of Bacterial infections and Blight diseases etc can be mixed with FYM and can incorporate during the last ploughings can also be used as foliar spray

Dosage

(seed treatment) :10 gms/1 kg of seed In case of tubers,bulbs and suckers,1kg of Pseudomonas should be deposited in 100 liters of water and soak them for half an hour and can be sown/Planted soil Application:100kgs of FYM mixed with 2 kgs of Tviridae can be incorporated into the field

Foliar spray : 3-5 gms/3-5 ml per 1 liter of water

Mother culture cost

100-120 Rs/kg

Shelf life

3 months

10. Verticillium Lecanii

Nutrient fixed	Type	Usage	Dosage	Mother culture cost
NA	Fungi	Used for the control of Whitefles, Green scale, Mealybugs, Aphids and jassids	Foliar Spray :3-5gms/3-5 ml per 1 liter of water	100-120 Rs/kg

Crops	Shelf life
All crops	3 months

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11. Beauveria

Nutrient fixed	Type	Usage	Dosage	Mother culture cost
NA	Fungi	Used for the control of Bugs, All caterpillars, thrips, armyworms, Whiteflies, Borers etc	Foliar Spray : 3-5gms/3-5 ml per 1 liter of water	100-120 Rs/kg

Shelf life
3 months

12. Metarhizium

Nutrient fixed

NA

Type

Fungi

Crops

All crops

Usage

Used for the control of beetles and weevils

Dosage

Foliar Spray : 3-5gms/3-5 ml per 1 liter of water

Mother culture cost

100-120 Rs/kg

Shelf life

3 months

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Multiplication Process

Bacteria - Method 1
(Azotobacter, Azospirillum, Pseudomonas, Rhizobium)

Prepration Time

7 days

Dosage

3 gm of Mother culture into media

Estimated cost

-7 dhanyas -Rs 100

Raw materials Required

Jaggery - 10 gms
Pressure cooker- 20 liters
NACL-1gm
Mother culture

Shelf life

6 months-1 year based on the expiry date

Operations/procedure to be done

Take the 1 liter capacity glass vessels or jars as many as possible which can fit into the pressure cooker,fill the glass jars/bottles with 10gms of jaggery and 2gm of NACL in each bottle and Close the bottles with airtight non absorbent cotton, sterilize the in the pressure cooker upto the 7 whistles and cool them at room temperature until it reaches to 38 degree centigrade then transfer the mother culture in Sterilized room and by keeping the vessels close to the burning spirit lamp then agitate continuously for 2 days and transfer tand allow the solution to settle down for 1 week then the solution is ready

Bacteria - Method 2

(Azotobacter, Azospirillum, Pseudomonas, Rhizobium)

Prepration Time

7 days

Dosage

3 gm of Mother culture into media

Estimated cost

-7 dhanyas -Rs 100

Operations/procedure to be done

Take the 1 liter capacity glass vessels or jars as many as possible which can fit into the pressure cooker,fill the glass jars/bottles with 5gms peptone ,3 gms of yeast,meat/beef extract-2gm and NACL-5 gms and Close the bottles with airtight non absorbent cotton,sterilize the in the pressure cooker upto the 7 whistles and cool them at room temperature until it reaches to 38 degree centigrade then transfer the mother culture in Sterilized room and by keeping the vessels close to the burning spirit lamp then agitate continuously for 2 days and transfer tand allow the solution to settle down for 1 week then the solution is ready

Raw materials Required

"Pressure cooker-20 liters
Peptone -5gms
Yeast-3gms
Meat/beef
Extract-2gms
Nacl-5gm"

Shelf life

6 months-1 year based on the expiry date

Fungi - Method 1

(Trichoderma viridae, Baeuveria, Verticillium lacani, Metarhizium)

Prepration Time

7 days

Dosage

3 gm of Mother culture into media

Shelf life

6 months-1 year based on the expiry date

Raw materials Required

Polypropalene Covers(10 cm x7 cm)
Jowar -250 gms
Water -175 ml
PVC pipe pieces for closing the covers
Non-absorbant cotton
Silver foil/news paper
Mother culture

Operations/procedure to be done

Soak the jowar for night and make them half boiled,and take the PPcovers and fill upto 1/4th(300gms of jowar),close the cover by using small pieces of PVC pipes,non absorbant cotton and silver foil/news paper and take the pressure cooker and fill the it with 4-6 inches of water and allow it to sterilize for half an hour and allow it to cool down at room temperature,Then transfer the mother culture in a room on a table by creating aseptic environment in the presence of burning sprit lamp,keep it a side for 7-14 days at room temperature,then the content fistly turns into white colour and then turns into blue colour and sterilize the tray and transfer the content to the tray and dry it at room temperature then the entire culture will get dried and make it into powder and the content is ready for use or mix the obtained content with 2 liters of water and collect the liquid solution,the liquid solution is ready for use.

Fungi - Method 2

(Trichoderma viridae, Baeuveria, Verticillium lacani, Metarhizium)

Prepration Time

7 days

Dosage

3 gm of Mother culture into media

Shelf life

6 months-1 year based on the expiry date

Raw materials Required

"Polypropalene Covers(10 Cm length and 7 width)
Each cover capacity -300 gms
CaCo3-20gms/Kg
CaSo4-5gms/kg
PVC pipe pieces for closing the covers
Non-absorbant cotton
Silver foil/news paper
Baveria mother culture"

Operations/procedure to be done

Soak the jowar for night and make them half boiled,and take the PPcovers and fill upto 1/4th(300gms of jowar) and caso4-20gms/kg of seed and Caco3-5gm/kg of seed, close the cover by using small pieces of PVC pipes,non absorbant cotton and silver foil/news paper and take the pressure cooker and fill the it with 4-6 inches of water and allow it to sterilize for half an hour and allow it to cool down at room temperature,Then transfer the mother culture in a room on a table by creating aseptic environment in the presence of burning sprit lamp,keep it a side for 7-14 days at room temperature,then the content fistly turns into white colour and then turns into blue colour and sterilize the tray and transfer the content to the tray and dry it at room temperature then the entire culture will get dried and make it into powder and the content is ready for use or mix the obtained content with 2 liters of water and collect the liquid solution,the liquid solution is ready for use.

Bacteria Multiplication (Laboratory conditions)

(Azotobacter, Azospirillum, Pseudomonas, Rhizobium)

Prepration Time

3 days

Dosage

3 gm of Mother culture into media

Shelf life

6 months-1 year based on the expiry date

Raw materials Required

"Pressure cooker-20 liters
Peptone -5gms
Yeast-3gms
Meat/beef Extract-2gms
Nacl-5gm"
Water-500ml in each flask

Operations/procedure to be done

Take the 1 liter capacity Conical flasks as many as possible which can fit into the pressure cooker,fill the glass jars/bottles with 5gms peptone ,3 gms of yeast,meat/beef extract-2gm and NACL-5 gms and Close the bottles with airtight non absorbent cotton and close it with silver foil/new paper,sterilize the media in the auto-clave for 15minutes with 15 LB pressure at 121*C and cool the at room temperature till reaches 38*C, thenkeep all media bottles in Laminar air flow chamber and switchon UV light for 2 minutes for steriliza-tion,then transfer the mother culture in Laminar air flow chamber by keep-ing the vessels close to the burning spirit lamp, then agitate continuously for 2 days in the agitator/shaker and transfer and allow the solution to settle down for 3 days, then the solution is ready

Fungi Multiplication (Laboratory conditions)

(Trichoderma viride, Beauveria, Verticillium lecanii, Metarhizium)

Prepration Time

7 days

Dosage

3 gm of Mother culture into media

Shelf life

6 months-1 year based on the expiry date

Raw materials Required

Pressure cooker - 20 liters capacity
Water - 500 ml
Jaggery -50 gm
Yeast - 3 gm
Chloramphenicol Capsule-50 mg

Operations/procedure to be done

Take 1 liter capacity conical flasks as many as possible which can fit into the pressure cooker,pour 500 ml of water and add jaggery - 50 gms, yeast-3gms and chloramphenicol tablets-50 mg in each bottle and Close the bottles with airtight non absorbent cotton and close it with silver foil/newspaper,sterilize the media in the autoclave for 15minutes with 15 LB pressure at 121*C and cool the at room temperature till reaches 38*C, thenkeep all media bottles in Laminar air flow chamber and switchon UV light for 2 minutes for sterilization,then transfer the mother culture in Laminar airflow chamber by keeping the vessels close to the burning spirit lamp, then agitate continuously for 2 days in the agitator/shaker and transfer and allow the solution to settle down for 1 week, then the solution is ready

NATIONAL COALITION FOR NATURAL FARMING

The National Coalition for Natural Farming is a collaborative platform to build knowledge and capacities in multiple dimensions among all stakeholders to accelerate the practice and policy related to agroecology-based farming in its multiple variants in India. The effort is to facilitate the empowerment of a significant number of small and marginal farmers covering a substantial area of land. With special emphasis on socially marginalized groups and regenerating environmentally vulnerable areas, with farmers' collectives as the foundational basis and women farmers in leadership roles.