PLAYBOOK

Best practices from rural livelihood projects supported by Axis Bank Foundation

RURAL LIVELIHOOD

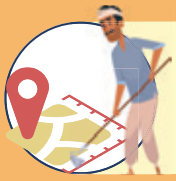
AGRICULTURE

How to prepare and use bio-inputs to prevent and manage agricultural pests and diseases after sowing

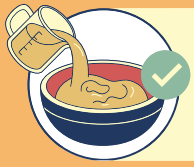
What
need does the playbook address?

- To increase agricultural yield and prevent diseases and pests, farmers have resorted to inorganic, pesticide-laden chemicals.
- This causes long-term health effects for farmers and consumers of the produce
- Destroys beneficial bacteria and micro-organisms in the soil and increases the possibility of pesticide-resistance among pests and diseases.
- This also incentivises misuse or over-use of these chemicals and creates a cycle of dependency on these chemicals which can be expensive for farmers.

This solution can be adopted if:



You are a small/marginal farmer



You have access to raw materials and ingredients mentioned in the bio-input recipes

You have enough space to prepare and store the bio-inputs

Who can use this Playbook: **Trainers, Community Resource Persons**

This playbook is designed using the expertise of TCL, which encourages organic farming among socio-economically disadvantaged communities & landless/marginal farmers in the Gangetic plains of Northern India.

What
are the benefits to farmers through use of bio-inputs?

It uses locally-available resources which is better for the soil (sustainable).

It preserves micro-organisms which improve soil quality

It saves money by reducing dependency on chemical inputs.

It is a better & safer produce for consumers by saying no to pesticides-laden chemicals.

It has no adverse effects through over-use

01

Matka Rasayana

An easy-to-make natural way to fight off pests and fungal infections.

This has been designed to use freely available leaves in the village. A total of 12 types of leaves can be used to prepare. A minimum of 7 of the first ingredients can be used.

Ingredients

0.5 kg

Madaar leaves

Calotropis Procera Leaves

0.5 kg

Bakayin leaves

Chinaberry leaves

0.5 kg

Bhet leaves

0.5 kg

Dhatura leaves

Jimsonweeds Leaves

0.5 kg

Sharifa leaves

Custard Apple Leaves

0.5 kg

Kander leaves

Nerium Oleander Leaves

125 gm

Chilli Fruit

62.5 kg

Rotten Garlic

0.5 kg

Neem leaves

Azadirachta Indica Leaves

0.5 kg

Besharam leaves

Pink Morning Glory Leaves

0.5 kg

Bhang

Preparation

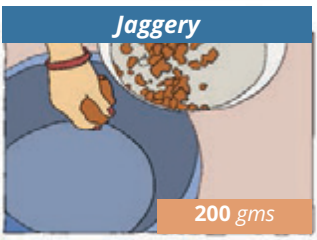
Separate the leaves from the twigs.

Cut the leaves into small pieces with a knife.

On a weighing machine, weigh the cut leaves.

Add all the cut leaves into a drum.

05 Add the following ingredient to the drum.



Mix them all well.

Store & cover the drum with a fine net/jute bag.

Strain the liquid after **15 days**

Application

Most effective when used to prevent diseases & pests v/s application after pests have attacked the plant

01 *Start using it **10-12 days** after the seed/**sapling has been planted** in the soil*

10-12 Days

02 *Mix **500-750ml of Matka Rasayana** in 15 liters of water. Apply through spray machine*

Matka Ramayana
500-750 ml

Water
15 lts

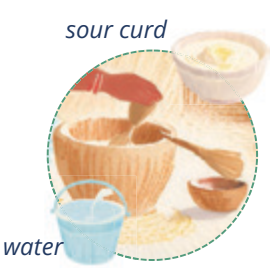
03 *Spray every **10-12 days on** plants in the **evening**. (Avoid spraying in the morning or the heat of the day).*

10-12 Days

02 Chaanch : use of buttermilk

Buttermilk can be used effectively to fight fungal infections in plants

Preparation using sour Curd



01
Sour curd is mixed and churned with **water**. No salt is added into it.

02
It is **stored in a copper vessel** (or, in an earthen/plastic pot with a **copper wire** dipped into it)

03
Let it **rest** in the **shade** for **1 week** (copper sulfate is absorbed by the buttermilk solution)."

Uses

01
200 ml
Mix 200 ml of solution with
15 lts
of water & apply over plants

02
Spray the mixture once in every
15 Days
in the evenings.

03
If the **fungal attack/flowering** is seen or if climatic conditions change, then spray it once in **7-8 days**

Benefits

For plant growth

Controls fungal growth

You can use foilar spray to apply the mixture you have made and stored.

03 Bio-stimulant

This is the creation of a liquid that simulates plant hormones and allows it to grow faster.

Ingredients

Soyabeen Seeds	Jaggery	Moringa Leaves	Mahua Flowers	Bananas	Water
					
10 kgs	**05** kgs	**25** kgs	**28** kgs	**60** nos.	**120** lts

Preparation

01

Soak Soyabean, Moringa Leaves, and Mahua flowers in water for **3 days.**

10 *kg Soyabeen seeds*

25 *kgs Moringa leaves*

28 *kgs Mahua flowers*

02

Filter the above-mentioned mixture & **add 120 liters** of water to it

120 *lts Water*

03

Add jaggery & Banana & **mix thoroughly.** Let it sit for up to **20 days.**

05 *kgs Jaggery*

60 *nos. Bananas*

04

After 20 days, **filter** the liquid & **store** it in air-tight containers

20 Days

Uses

For small plants

350 ml

per 15 lts water in foilar spray

For big plants

500 ml

per 15 lts water in foilar spray

*spray **15-20 days** intervals, especially the tillering stages, flowering stage, and fruit.pod formation stage*

04 Organic Insect Repellents

The recipe is made by mixing three extracts: a bitter leaf extract, a seed/kernel extract, and a concentrate of Garlic and Onion

Leaf Extract: Ingredients

Bitter Leaf: **25 kgs**

Cow urine: **25 lts**

Water: **120 lts**

We can use one or more of the following leaves:

Behaya Leaves *Ratanjot Leaves* *Kaner Leaves* *Neem Leaves* *Dhatoora Leaves* *Madar Leaves*

Preparation

01

Mix 25 kg of leaves, and 20 litre of cow urine and **set aside for 3 days.**

25 *kgs Bitter Leaves*

25 *lts Cow urine*

02

Then **mix 120 lts of water** & to the above-mentioned mix.

120 *lts Water*

03

Mix **daily: 1 minute** in the **morning** & **1 minute** in the **evening**

01 Min

Morning

Evening

04

Preparation will be complete in **20-25 days**

20-25 Days

Seed Extract: Ingredients

Neem Kernel: ***18 kgs***

Mahua Seed: ***6kgs***

Karen Seed: ***6 kgs***

Cow Urine: ***20 lts***

Water: ***120 lts***

Preparation

01

Grind Neem, Mahua, and Karanj seeds and **soak them** for 3 **days in cow urine**

18 *kgs Neem Kernel*

06 *kgs Mahua seeds*

06 *kgs Karen seed*

20 *lts cow urine*

02

After **3 days**, make it into a **paste** and **mix** it with **120 liters of water**

120 *lts Water*

03

Preparation will be complete in **20-25 days**

20-25 Days

04

Mix **daily: 1 minute** in the **morning** & **1 minute** in the **evening**

01 Min

Morning

Evening

Garlic-Onion Concentrate: Ingredients

Garlic: ***10 kgs***

*Onion :****10 kgs***

Green Chilli: ***20 kgs***

Ginger: ***10 kgs***

Water: ***120 lts***

Preparation

01

Make a **paste** out of Garlic, Onion, Ginger and Green Chilli. **Soak** it in **warm water for 5 days**

10 *kgs Garlic*

10 *kgs Onion*

20 *kgs Green Chilli*

20 *lts Ginger*

02

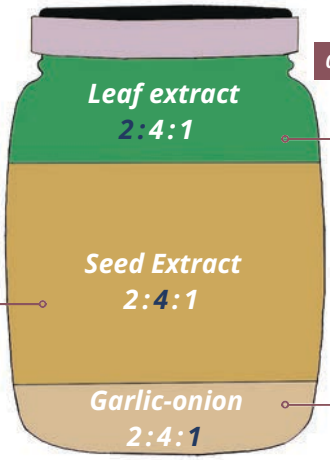
Then Filter the paste in 5 days.

03

Apply on plants when the weather turns **cloudy or when insects are seen in the field**. Apply every week when insects are spotted on crops

Application

Combine 2 leaf extract, 4 parts of Seed extract, & 1 part of Garlic-Onion Concentrate 2:4:1 ratio for leaf extract, seed extract, and garlic-onion concentrate.



01 Divide the tight container in 7 parts out of which **take 2 parts for leaf extract.**

02 After adding the leaf extract, then **add 4 parts of seed extract.**

03 Finally, add **1 part of garlic-concentrate.**

For small plants

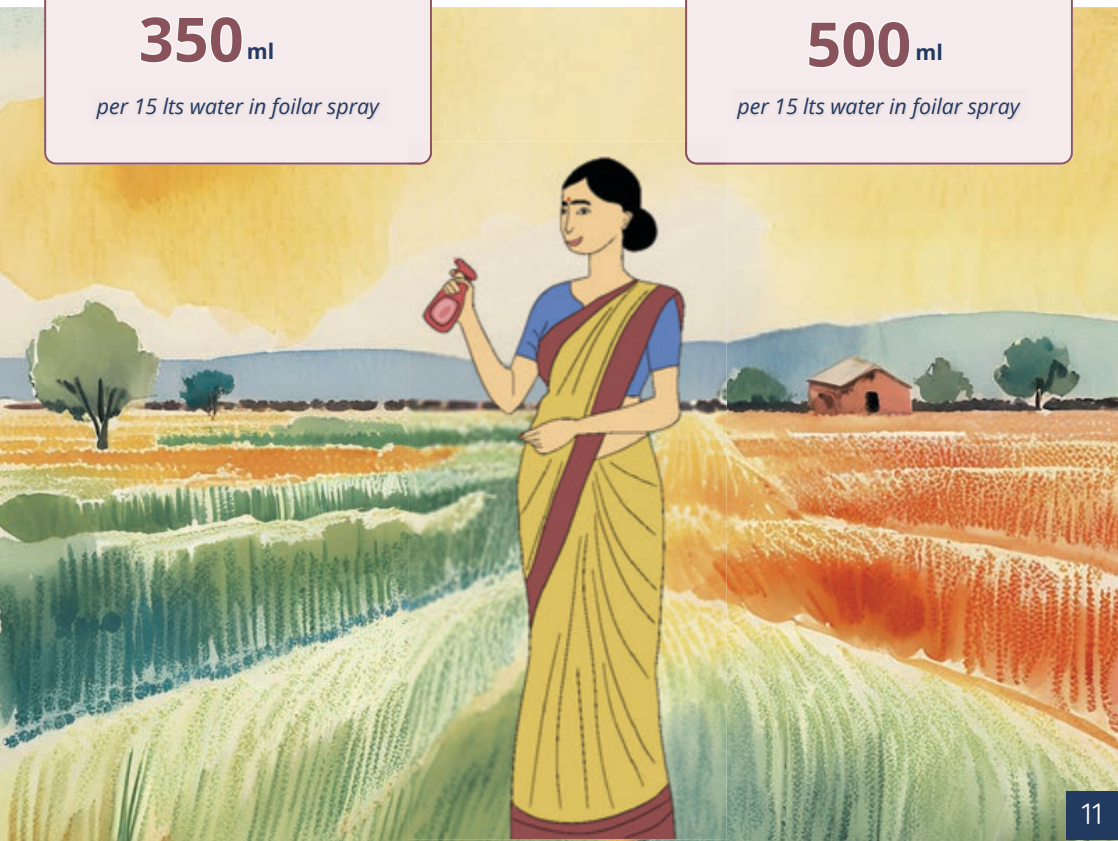
350 ml

per 15 lts water in foilar spray

For big plants

500 ml

per 15 lts water in foilar spray



Bio-enzymes

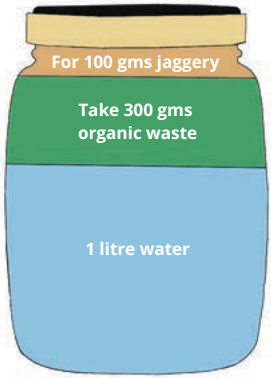
Recipe

The ratio to be followed is ***1:3:10***

Jaggery: ***1 part***

Vegetable and bio waste: ***3 part***

Water: ***10 part***



A. Creating "Mother Culture"

01

For the **first batch**, let the mixture **sit for 90 days.** **90 Days**

02

This mixture can be put in **successive batches** to hasten the fermentation process

03

For successive batches where mother culture is added, it will take **45-60 days**.

45-60 Days

B. Nuturing the mixture

01

In the **first month**: **Remove** the **container lid** for a few seconds **weekly** to release built-up gasses.

02

In the **second, and third months** (for the first batch): **remove the lid** of the container **every 10-15 days**

Signs that the process is working

01 **Sweet-sour vinegar-like** smell starts **developing**

02 Over time, **organic waste** starts settling **down**, & clear **bio-enzymes** liquid **appear**

03 pH should be around 2.5-3 **2.5-3 pH**

04 Once the solution is ready, filter out the mixture.

The liquid can be stored in air-tight containers; the pulp can be used in the compost pit or as mother culture for successive batches.

How to use bio-enzymes

01

Dilute bio-enzyme mixture: for **1 litre of** bio-enzyme, use **50-100 litre** of water.

02

Use through foliar **spray** once in **7-10 days** for **vegetables & flowers &** once in **15 days** for other **crops & fruit orchards**

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