

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**



Beta, pass the Jeevamrut solution to me.

Here, papa. We can make another batch soon, as all the ingredients are locally-available.

But will these be helpful to prevent pests and diseases which infest the crops?

Oh Yes! We can make similar recipes like matka rasayana, which can act as pesticides and even increase resistance after continuous use over years.

Yes and seems like all these recipes can be made at home. But will these be as effective as the chemicals we get in the market?

Papa, we were told in the training that even though it takes time compared to chemical based pesticides, their effectiveness in reducing pest populations and minimizing the need for chemicals can result in cost savings and increased profitability over time.

You are right. Let's start with arranging ingredients for these bio-input recipes.

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.



Yes



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

No



It has no adverse effects through over-use

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



Preparation



01 Separate the leaves from the twigs.



02 Cut the leaves into small pieces with a knife.



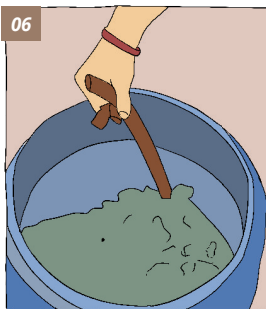
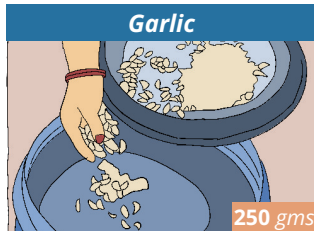
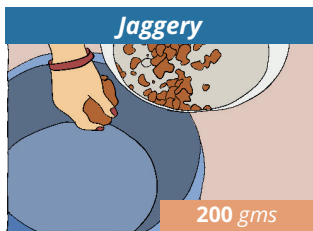
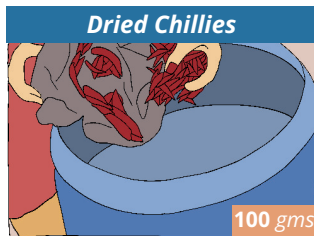
03 On a weighing machine, weigh the cut leaves.



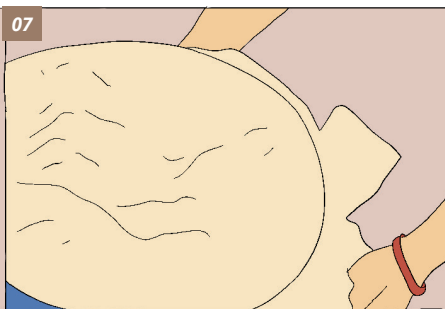
04 Add all the cut leaves into a drum.



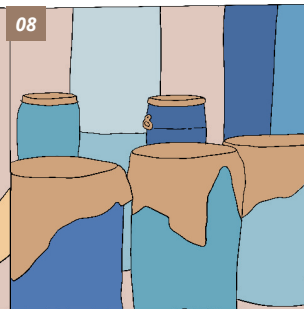
05 Add the following ingredient to the drum.



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 Rasayana

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

Buttermilk can be used effectively to fight fungal infections in plants

Preparation using sour Curd

sour curd



water

copper wire



01 rest week



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.



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

Ingredients

Soyabeen Seeds



10 kgs

Jaggery



05 kgs

Moringa Leaves



25 kgs

Mahua Flowers



28 kgs

Bananas



60 nos.

Water



120 lts

Preparation

01

Soak Soyabeen, 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



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

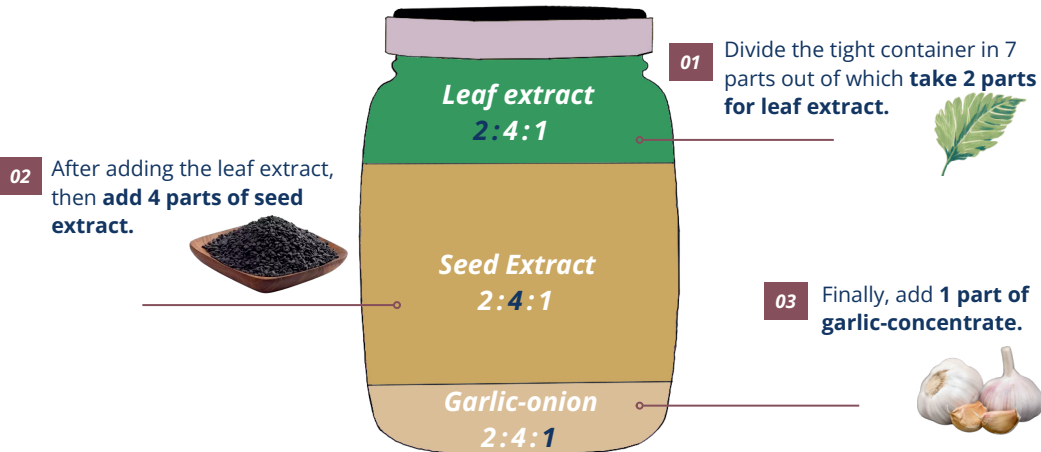
Then Filter the paste in 5 days.

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.



For small plants

350 ml

per 15 lts water in foilar spray

For big plants

500 ml

per 15 lts water in foilar spray



Recipe

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



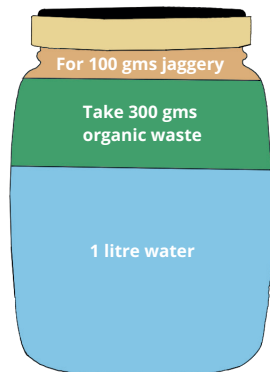
Jaggery:
1 part



Vegetable and bio waste:
3 part



Water:
10 part



A. Creating “Mother Culture”

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