Soil Recipes

A how-to-do-it manual of soil nutrition and maintenance

(Text verified by experienced organic farmers)

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Why this Manual on Soil Recipes

One of the basic principles on which organic farming is based is that the farmer feeds the soil, not the plant.

This immediately distances organic farming from farming based on chemicals. With the latter, the farmers dose the root zones of plants (on the assumption that they must feed the plant itself) and then protect the plants themselves with chemical sprays.

With the entry of Genetically Modified Organisms (GMO) or GM seeds, the entire plant is made into a factory for generating toxins that are bound to affect living creatures that are the product of natural evolution over millennia. GMO-based agriculture takes the growing of plants even further away from adherence to natural principles (on which healthy life is based).

In other words, the entire focus of modernised, chemical-based agriculture is the plant and the nutrition of the plant. The entire focus of organic agriculture is looking after the soil.

Healthy soils support healthy crops. Healthy crops have no need of growth promoters. (This is similar to the fact that babies that are brought up on mother's milk have no need for formula milk.)

But, as the child grows, along with mother's milk, we give it some solid food as well. Similarly, we can also promote healthy plant growth by providing the soil with some maintenance inputs, using different preparations like amudham solution, coconut-buttermilk solution, and buttermilk-arappu solution, jeevamrut and panchagavya. What do all these solutions do? They largely enable the soil to re-stock its populations of beneficial soil microbes. They turn the soil into a living medium. The microbes supply the plant with the necessary nutritional requirements it has habitually got from the soil.

In contrast, soil in chemical agriculture is dead and sterile. All living creatures, including soil bacteria, earthworms and termites, all key actors in maintaining the living nature of the soil, have vanished.

We can also say with confidence that these preparations are useful to control disease because when we help the soil to raise healthy plants, they also develop the capacity to resist and fight diseases and insect attacks.

This simple manual of feeding the soil and soil maintenance has been prepared based on the various recipes available. The practices have been profusely illustrated by Isa Alvares, who is herself a person trained in agriculture.

The recipes have been vetted and verified by experienced organic farmers belonging to the Organic Farming Association of India.

Now, at last, you can fully say, bye, bye chemicals!

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Claude Alvares
Director
Organic Farming Association of India
AMUDHAM SOLUTION

This solution acts as a catalyst for plant growth. With very little work we can create this solution within twenty four hours.

Ingredients:

- 1 lt. cattle urine
- 1 kg dung
- 250 gm jaggery (gur)
- 10 lt. water

Preparation:

- Mix the dung thoroughly in water. Add urine and mix well.
- Powder the jaggery and dissolve it in small quantity of water or urine, add to the above, and mix well. Make sure there are no lumps.
- Cover and set the mixture aside for 24 hours in shade.

Instead of using jaggery (gur), you may use waste fruit in this manner: Tie one kilogram waste fruit into a nylon mesh and immerse this in the above solution. Let it soak for five days. This helps the fruit ferment well.

Applications:

Add for a 10% solution 10 lts. water + 1 lt. solution. And spray.

You must make sure to dilute the solution or else the leaves will get scorched (burnt).

For one acre, add 10 - 50 lts. of the solution in irrigation water. According to growth of the crop and convenience one can use it once at an interval of 7 - 15 days.

Benefits:

- This solution helps growth promotion activity in leaves directly. It also repels insects.

CONCENTRATED AMUDHAM SOLUTION

Ingredients:

- 5 lts. cattle urine
- 1 kg dung
- 1 lt. juice of any waste fruit

Preparation:

- Mix the dung thoroughly in the urine and the juice and mix well.
- Set aside the mixture for five days.

Usage:

Use 20-30 lts. per acre of this solution.

Note:

In this method, the use of jaggery (gur), an external input, is avoided. This mixture can only be used for irrigation and not for spraying.

Ordinary amudham solution used in irrigation requires 50-100 litres per acre.

To reduce the quantity and work we developed this combination. It ensures excellent growth.
EGG EXTRACT

This solution was originally conceived by Ms. Veeriachinnammal of Theni district (TN) as medicine for asthma.

Ingredients:

- 4-5 chicken or duck eggs
- Juice of 20-25 lemons
- Around 500 gm jaggery or molasses

Preparation:

Cut and squeeze the lemons into a bucket. Empty the juice in a plastic/glass or mud jar and place the eggs inside it in such a way that all the eggs are well immersed inside the lime solution. Never use metal container.

On the 10th day, the eggs along with the shells inside the solution would have become rubbery, like a rubber ball. Use your hands to mix the eggs (along with the shell) in the lime solution.

Close the jar with an air tight lid and keep it in the shade for about 10 days.

Take about 250 gm. jaggery and boil it in 1/2 lt. water. Once the jaggery dissolves keep it aside and let it cool.

For example, if there is 2 lts. of the lime egg solution, then add 2 lts. of jaggery solution; if there is 3 lts. of the lime egg solution add 3 lts. of jaggery solution and so on.

Then close the bucket tightly for about 10 days.

Applications:

About 10 to 50 ml of the formulation can be diluted in 10 lts. of water and sprayed.

The concentration varies according to the growth of the crop. Start with normal concentration (10 ml in 10 lts. to be sprayed and increase the concentration upto 50 ml in 10 lts. when plant growth enhances (more tillering, branching etc).

This formulation can be sprayed for any crops such as paddy, wheat, banana, vegetables, greens and fruit trees. It is important that the spray be done either in the morning or late evening.

Benefits:

This solution is a great nutrient for the plants and will boost plant growth.
GUNAPASELAM
(Fish masala or fish extract)

(A plant growth stimulant from fish waste widely used by organic farmers in Japan, Korea, etc.)

Ingredients and materials:

- Any variety of native fish or fish waste
- Jaggery or molasses
- Piece of jute or cotton cloth
- Strainer
- Mud pot or a plastic bucket or a glass jar or any another container with cover but NO metal container.

Preparation:

Chop the fish into fine pieces.

In a container that is just the size, measure the same quantity of fish, jaggery or molasses:

For 1 kg fish, 1 kg jaggery; for 1 kg of fish waste, add 1 1/2 kg of jaggery.

On the 5th day and during the next 20 to 30 days you have to stir the mix once a day every day. During this time you will notice how the smell changes from bad to sweet.

Around the 10th day the solution will be fermented but you can keep it 15 to 20 days more. You can judge by the smell: when the smell disappears, the solution is ready to use!

Decant the solution through a strainer and the filtrate looks like honey-like syrup.

Keep the filtrate in a glass jar or another container with cover and close it tight. The extract will remain in good condition for 6 months.

If you use fresh fish in 1” pieces, you can use these a second or third time to prepare the solution, but fish waste can be used only once. Every time you have to add an equal quantity of jaggery to the remaining fish and keep it for fermentation for 15 to 20 days.

Benefits:

Gunapaselam is an excellent plant tonic. It assists in plant growth providing nitrogen (8 to 10 % of plant’s requirement). It is a rich source of amino acids, microbes, micro and macro nutrients which also help to enhance the soil fertility. It is proved to be effective, both as a natural growth promoter as well as a pest repellent. Used in addition with other sprays, it helps in control of root grubs.
Fish protein is hydrolyzed from fish waste to serve as animal feed and plant supplement. This material was found to be nutrient rich, since it contains desirable macro (N, K, Ca, Mg, P, and S) and micro elements (Cl, Fe, B, Mn, Zn, Cu, Mo, and Ni) found in the viscera and head of fish.

**Application:**

Use it like a liquid foliar. Apply 3% to 5% in water as spray during dawn or dusk on any crop, for promoting growth, flowering and yield increase. It could also be mixed with irrigation water if one has more fish or fish waste. (proportion: of 2 lts. solution per hundred lts. water). When we prepare this extract from 3 – 10 kg of fish, then the quantity produced is sufficient for use in one acre of land.

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**JEEVAMRUT**

**Ingredients:**

- 200 lts. of water
- 10 kg cow dung
- 1 kg lentil powder (besan)
- 1 kg black jaggery
- A handful of live soil
- 5 lts. cow urine
- 1 kg jaggery

**Preparation:**

Add 10 kg cow dung, 5 lts. of cow urine, 1 kg black jaggery, 1 kg lentil powder, handful of soil in 200 lts. of water. First lentil powder and jaggery are mixed and then cow dung is added.
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Keep the solution for 2 to 7 days in the shade for fermentation. The lid should be kept loose or should have holes for gases to escape.

During the fermentation, the solution is stirred daily.

Application:

For a liquid foliar spray, apply 5% to 10% in water, and for soil, use 100-200 lts. per acre during irrigation. According to growth of the crop and convenience, one can use it once at an interval of 7 – 15 days.

Spray during dawn or dusk on any crop, for promoting growth, flowering and yield increase.

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ARAPPU BUTTERMILK SOLUTION

Ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>5 lts. buttermilk</td>
<td></td>
</tr>
<tr>
<td>1 lt. tender coconut water</td>
<td></td>
</tr>
<tr>
<td>1.2 kg arappu leaves (Albizia amara) or, 250-500 gms leaf powder</td>
<td></td>
</tr>
<tr>
<td>500 gms waste fruit or 1 litre juice from waste fruit</td>
<td></td>
</tr>
<tr>
<td>Turmeric powder</td>
<td>100 gms</td>
</tr>
<tr>
<td>Asafoetida powder</td>
<td>10-20 gms</td>
</tr>
</tbody>
</table>

Preparation:

Mix the buttermilk, tender coconut water, turmeric powder and asafoetida powder.

If using waste fruit, add it to the crushed leaves and put this mixture in a nylon mesh and tie it.
Immerse the mesh in buttermilk-tender coconut solution.

If you use arappu leaf powder, use fruit juice instead of waste fruit. Mix all four ingredients and let the mixture ferment for seven days.

By using the nylon mesh we could avoid the need for filtering the solution while spraying.

Applications:

Mix ten litres water with 1/2 to 1 lt. solution and spray.
For irrigation, use 5 to 10 lts. of solution per acre.

Benefits:

This helps plant growth, repels insects, and adds resistance against fungal diseases.

Recommendations:

Wherever arappu is not available, you may use soapnut seed powder instead. In that case, we call it soapnut-buttermilk solution.

Many plant parts—when they ferment—release a sticky, gum-like liquid. You may add this liquid to the buttermilk and let it ferment. Leaves of Neem, Aloe Vera, Custard apple and Tulsi can also be used. Out of these, any two can be used.

Again, we wish to remind you about Prof. Dhabolkar's suggestion that every farmer should become an innovator.

COCONUT-BUTTERMILK SOLUTION

Ingredients:

- 5 lts. buttermilk
- 1 lt. tender coconut water
- One to two coconuts
- Asafoetida powder 10 to 20 gm
- 500 ml – 1 lt. juice from waste fruit (or 500 gm – 1 kg waste fruit, if extracting juice is not easy).

Preparation:

Mix the buttermilk, tender coconut, turmeric powder and asafoetida powder.
Grate the coconuts, add to the mixture, and let it soak. Or, mix grated coconut and fruit (if not in juice form).
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Put the mixture in a nylon mesh and tie it
Immerse it in the buttermilk solution. This solution ferments well in seven days.

Applications:
Mix 10 lts. water with 1/2 to 1 lt. solution and spray.
This can also be used in irrigation at the rate of 5-10 lts. per acre.

Benefits:
It helps to enhance plant growth, repel insects and increase resistance to fungal diseases. Also, it enhances flowering in plants. This solution has the same growth enhancing potential as that of any other chemicals.

The contents of the nylon bag could be reused a few times in subsequent solutions by adding a small quantity of grated coconut every time.

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PANCHAGAVYA

Ingredients:
2 lts toddy, papaya or grape juice.
2 lts cow milk
3 lts tender coconut water.
3 lts cow urine

For preparing panchagavya, we need a wide mouthed mud pot, concrete tank or plastic cans.

1/2 lts cow ghee.
2 lts cow curds.
3 lts sugarcane juice, or 1 kg jaggery
12 ripe bananas

5 kg cow dung

2 lts toddy, papaya or grape juice.
**Preparation:**

Put the fresh cow dung, cow ghee and sugar cane juice or jaggery into the container and mix thoroughly twice daily for 4 days. Cover it with a wet cloth to avoid drying up of the mixture in shade.

On the fifth day, add the rest of the ingredients and stir twice daily for 15 days.

The panchagavya stock solution will be ready after the 20th day.

The panchagavya stock solution will be ready after the 20th day. It should be stored in the shade and covered with a wire mesh or plastic mosquito net to prevent house flies from laying eggs and the formation of maggots (worms) in the solution.

If sugarcane isn’t available, add 1 kg of jaggery dissolved in 3 litres of water. Likewise, if toddy isn’t available, add 100 grams of yeast powder and 100 grams of jaggery to 2 lts of warm water. After 30 minutes, add this solution to replace toddy.

Another method is to take 2 lts of tender coconut water + 100 grams jaggery and keep this in a closed plastic container for 10 days. After fermentation, it becomes toddy. This solution can be prepared beforehand and used to replace toddy. When stirred twice daily, the panchagavya solution can be kept for six months without any deterioration in its quality. Whenever the solution becomes thick due to evaporation of water over a long period, suitable quantity of water can be added to keep it in a liquid state.

**Parting Shot:**

The recipes you have tried from the earlier pages were all invented by innovation-bent organic farmers belonging to the Organic Farming Association of India.

We thank S. R. Sundara Raman and Dr T. Natarajan from Erode, Tamil Nadu, for their sincere efforts to verify these practices and add crucial details.

These recipes are based on the sound theory of living soils and healthy plants. However, all of them are based on practice and are therefore tested in hundreds of fields brought up the organic way.

The results of the use of these solutions have been analysed, tested and validated in laboratories of agricultural universities in different parts of the country.

The use of these solutions has made the organic farmer completely independent of loans from banks to purchase expensive fertilisers and synthetic pesticides, whose use anyway damages the soil, the environment and the food supplied by farmers to consumers, urban and rural.

All the technologies demonstrated in this manual are simple to understand and use. They harbour no toxic element and are safe when used or stored in the presence of children and domestic animals and pets.

They do not require great wealth to produce. Jeevamrut and panchagavya can be prepared from the dung of cows who no longer provide milk and are put out to living the rest of the lives (instead of being sent to slaughter houses).

Fish masala can be prepared from fish waste and trimmings found at fish markets.

For a living planet, one requires living soils. For life-giving food, one needs a living soil.

This is the way to go.
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About OFAI

OFAI is India's largest association of organic farmers and organic farming promoters. Its members come from every State and its membership includes most state-level organic farming associations as well.

The association was set up in 2003 to bring together the collective wisdom, insights and innovative techniques of organic farmers for the express purpose of re-orienting Indian agriculture towards sustainability.

The association's primary goals are to promote organic farming, especially among small and marginal farmers; strive for the conversion of India's consumers to protect their health by providing them with poison-free food; lobby for the adoption of policies that support organic farming; assist organic farmers with marketing their organic produce; and engage the experience of pioneering organic farmers for generating an educational programme that will stimulate youngsters (especially the children of organic farming families) to love work on the land and the growing of food.

The association does not support the export of organic products from the country, with its members insisting that Indian consumers should have first priority when it comes to having access to safe and healthy food.