Sistema.bio/fertilizer user manual

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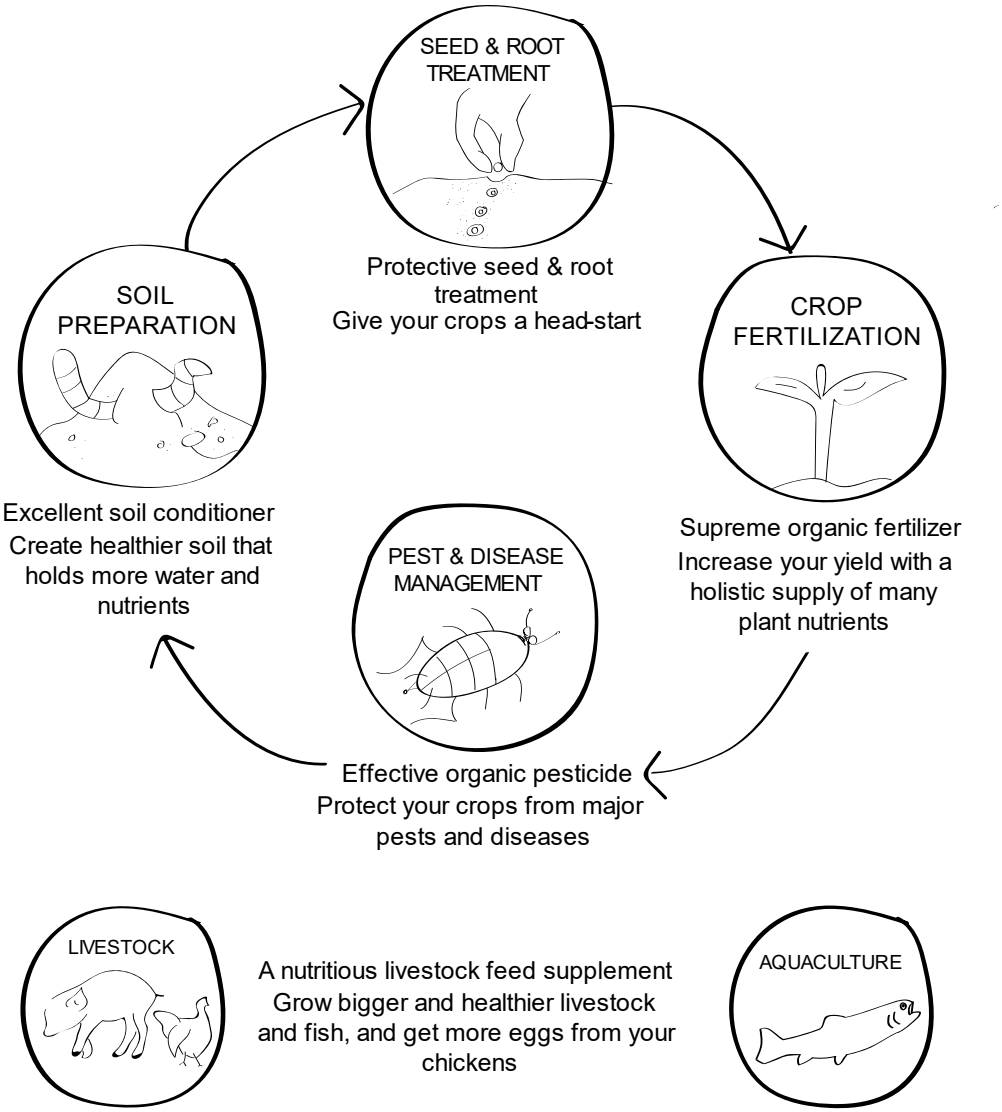

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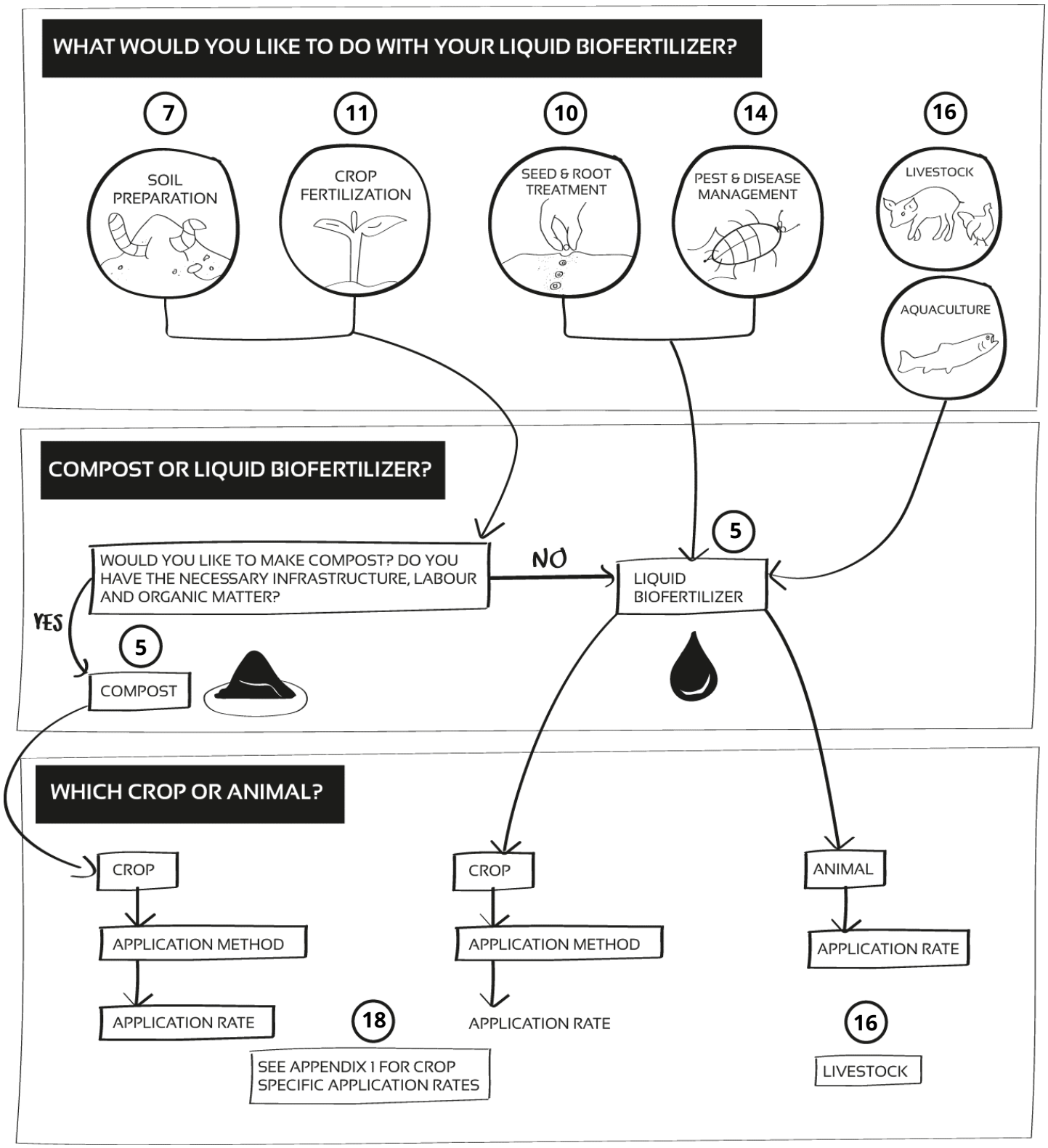
Content

The diagram below will help you decide how to apply biofertilizer on your farm.



◯ Page number

⚠ General guidelines

Risk prevention

- Wash hands with soap and water immediately after contact with biofertilizer.
- Prevent children and animals from accessing reactor and biofertilizer pit.
- Stop all biofertilizer application three weeks before harvesting.
- Do not use biofertilizer as a feed additive for cattle, goats or sheep.

General guidelines

- Ensure biofertilizer is covered during storage.
- Where possible add biofertilizer or compost to soil shortly before rainfall is expected.
- As a general rule, applications of 4-8kg of compost or 2-20 liters of liquid biofertilizer per m^2 can provide good results for most crops.
- If you normally use chemical fertilizer, gradually reduce the amount you use as you begin to use biofertilizer.
- Experiment to find the right amount of biofertilizer needed for your soil and crops -guidelines for crop specific application rates are provided in the appendix.
- Dilute liquid biofertilizer with water (2:1) when planting seeds or young plants and allow two days between biofertilizer application and vegetable seed planting.

Icon explanation

APPLICATION TYPE

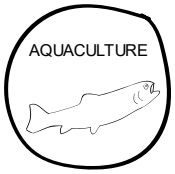
Soil preparation

Seed & Root treatment

Crop fertilization

Pest & disease management

Livestock



Aquaculture

BIOFERTILIZER FORM

Compost

Biofertilizer

APPLICATION METHOD

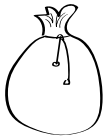
Seeds

Seedling

Mixture

Shovel

Pot



Cloth bag

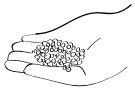
Watering can

Soil

Compost

Biofertilizer

Water



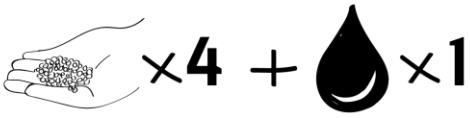
Animal feed

EXAMPLE OF DILUTION

2 parts water :
1 part biofertilizer

EXAMPLE OF APPLICATION METHOD

2 parts soil : 1 part compost



4 parts animal feed :
1 part biofertilizer

About biofertilizer

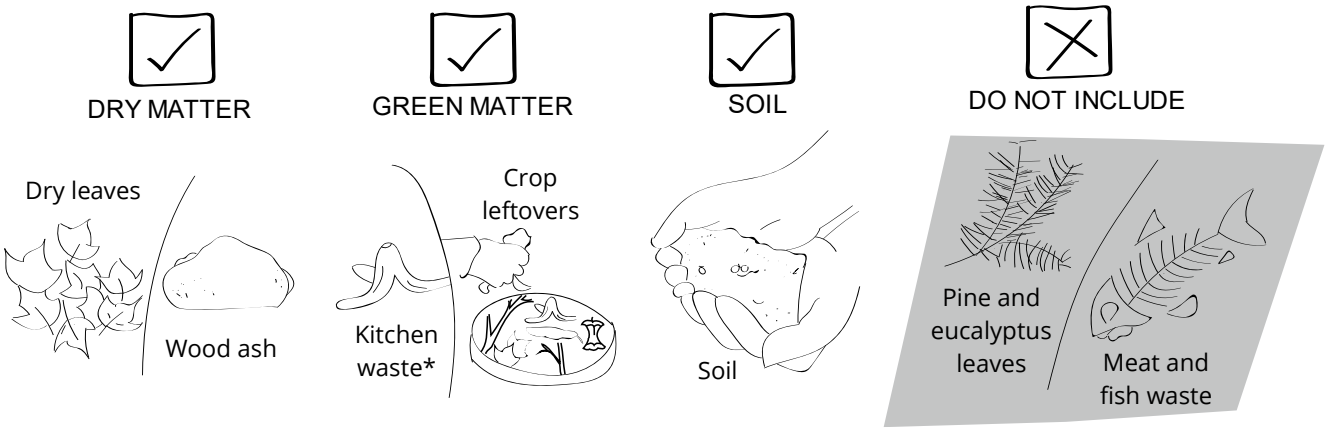
BIOFERTILIZER

- Biofertilizer is ready to use once it has left the reactor.
- However, most crops may require the biofertilizer to be diluted with water before use.
- Liquid biofertilizer can be handled easily using buckets, backpack sprayers, hosepipes and pumps, or irrigation systems. Speak to a technician about the best system for your farm.
- Biofertilizer should be covered while in storage to maintain its nutrient value and should be covered with soil and/or mulch after application to soil.

COMPOSTED BIOFERTILIZER

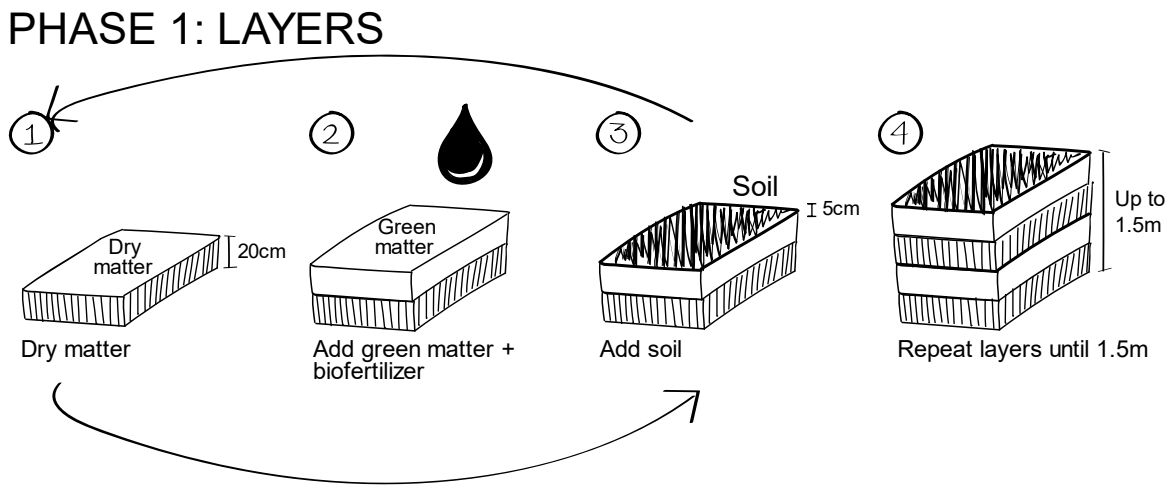
If you need to store your biofertilizer for a long period of time, composting is the best solution. Compost made with biofertilizer also improves yields and soil quality.

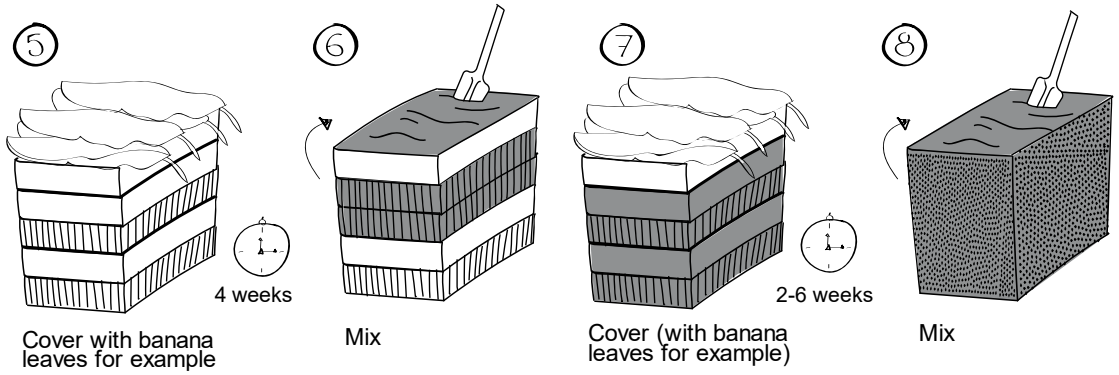
Compost is made by mixing biofertilizer with:



*The kitchen waste should be shredded before adding to the mixture.

How to make compost?





INSTRUCTIONS

- **When to turn compost?**

It is best to turn the compost after it has heated up. To see if the pile is hot, insert a stick in the center. Remove it after a few seconds – if the end of the stick feels hot, the pile will be ready for turning in a few more days. Add water if pile is dry.

- **When is compost ready?**

Compost is ready when it is a dark brown colour and smells pleasant. It will take roughly 8-16 weeks, depending on the temperature and how often you turn the pile.

Application methods

This section provides guidelines on how to apply biofertilizer for soil health, crop development, pest and disease management, and livestock farming.

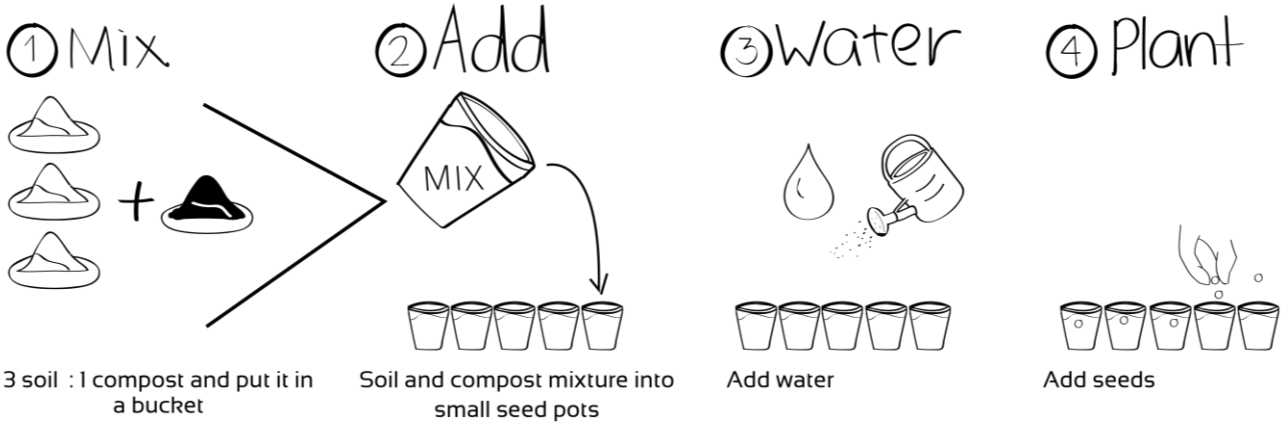
SOIL PREPARATION

Effective soil preparation is the foundation of a good harvest and can lead to: higher yields and crop quality; improved soil structure and water retention; reduced risk of pest and disease; improved seed germination rate; better plant growth; and increased plant root mass.

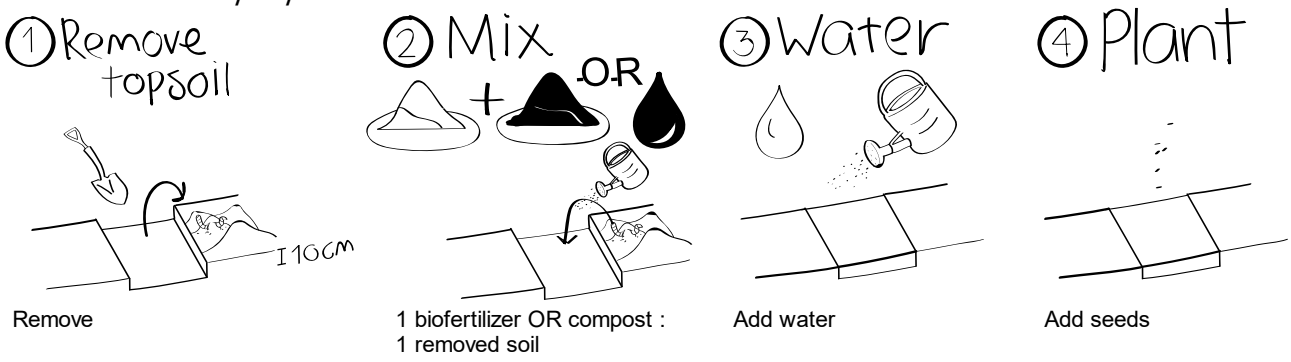
This section provides best practices for preparing soil with biofertilizer in order to plant perennial and annual crops. Choose methods that are most appropriate to your farm and check the crop specific applications in the appendix before applying biofertilizer.

Planting nursery

1. *Pot or seed tray preparation*

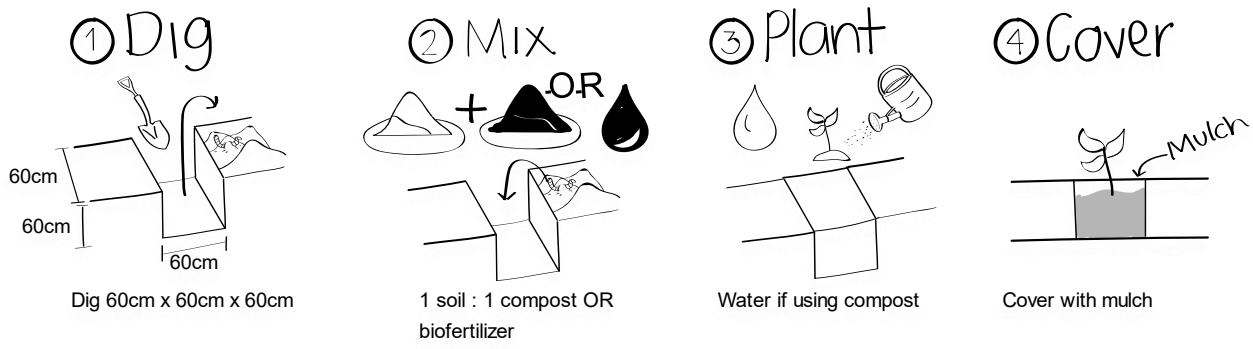


2. Seedbed preparation



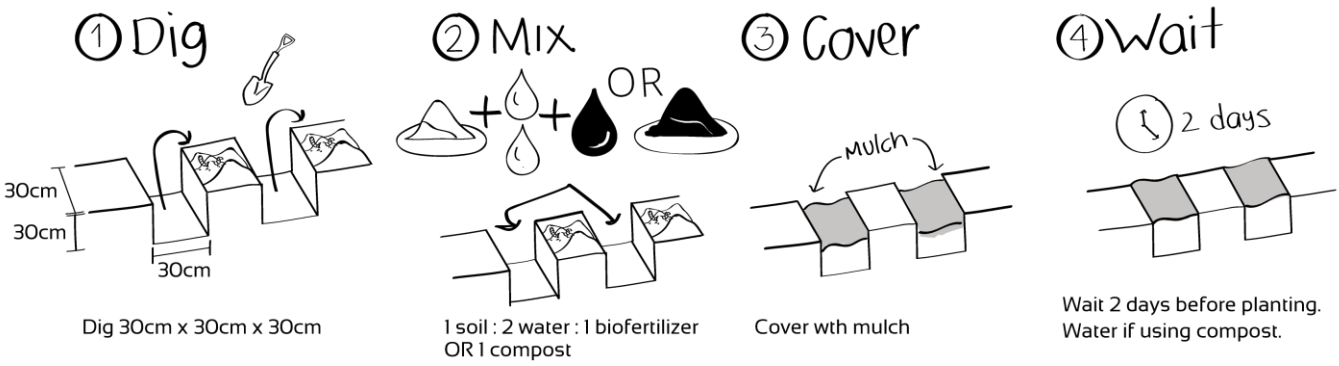
Perennial crops (e.g. banana, coffee, tea, fruit trees and shrubs, nut trees)

1. Plantation pits

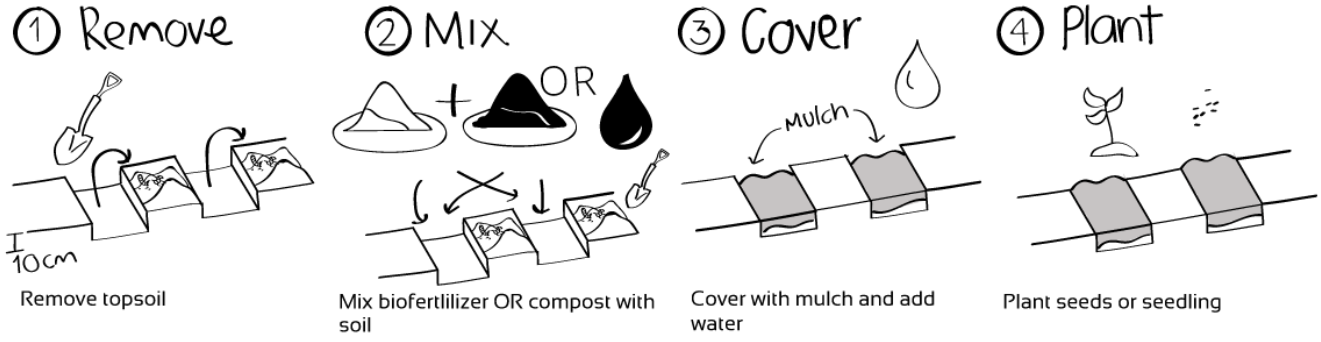


Annual crops (e.g. maize, cereals, and vegetables)

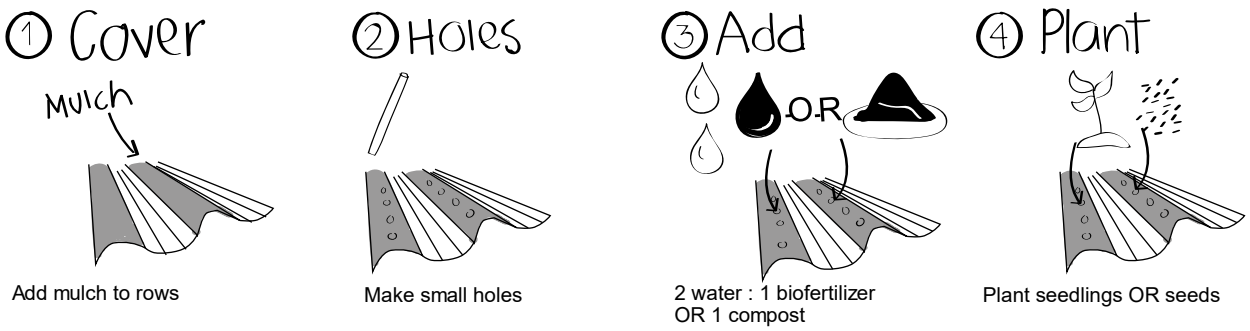
1. Covered trenches – best used when soil quality is poor



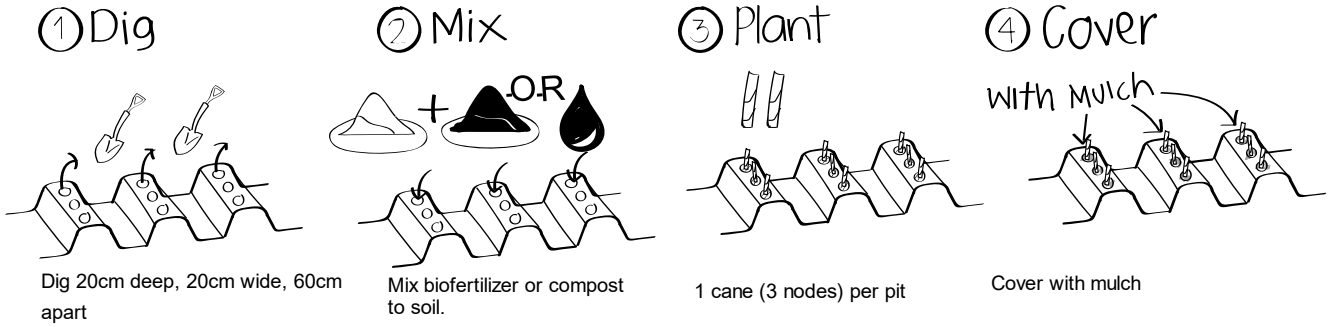
2. Mix and Mulch – best used when soil quality is good to maintain soil structure



3. Planting Pits – a good option for maize generally, and also for other vegetables in dry areas

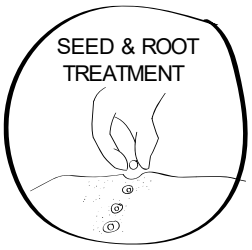


Sugar cane & fodder crops (e.g. Napier grass/Brachiaria grass)



End of section: SOIL PREPARATION

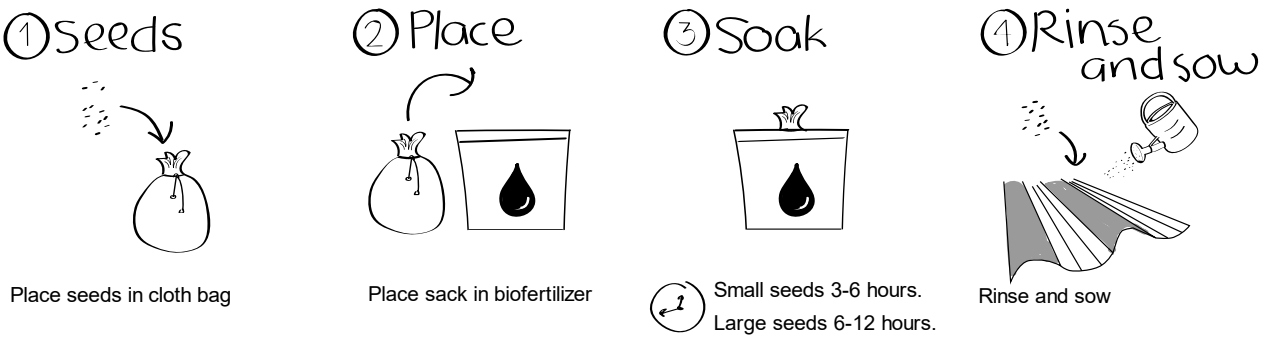
SEED & ROOT TREATMENT



Liquid biofertilizer can be used to coat crop seeds and roots before planting. This treatment can improve seedling development and help prevent pests and diseases. This section provides best practices for pre-treating seeds and roots. Choose the method that is appropriate for your farm. Crop specific applications can be found in the appendix.

All crops (annuals & perennials)

1. *Seed soaking*

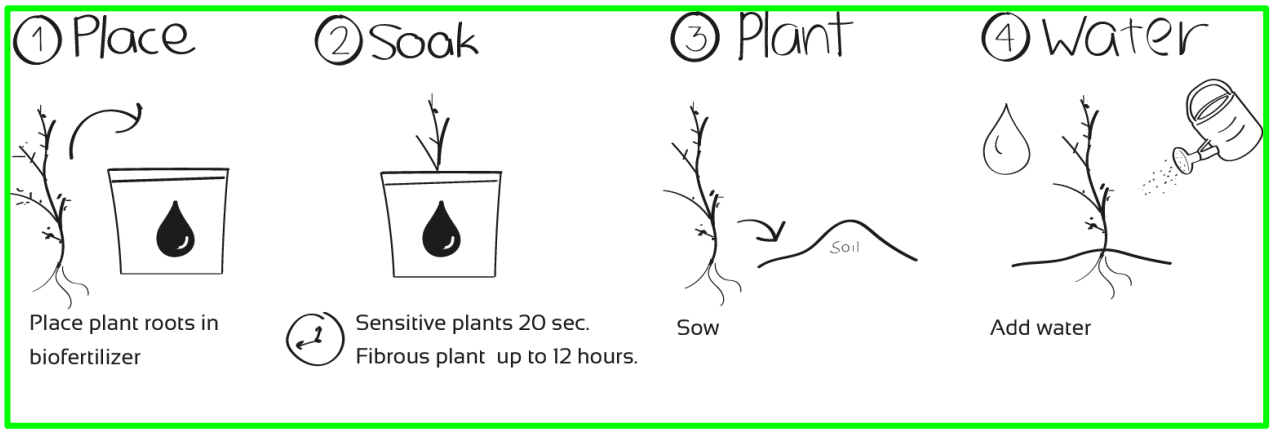


Leave small seeds in biofertilizer for up to 6 hours, and larger seeds for 6-12 hours. *There are many exceptions to this general rule, so you should check the crop specific application rates in the appendix.*

2. *Root soaking*

This application is particularly useful for perennial crops, fodder crops, and any plants that are reproduced without seeds.

Leave sensitive plants for a maximum of 20 seconds. Fibrous plants (plants with tough woody stems and



roots) can be left for up to 12 hours. *There are many exceptions to this general rule, so you should check the crop specific application rates in the appendix.*

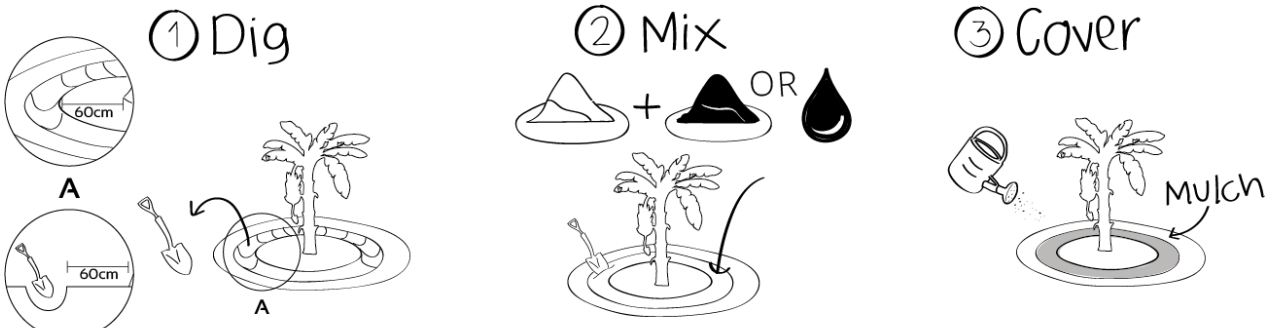
End of section: SEED & ROOT TREATMENT

CROP FERTILIZATION

Biofertilizer contains a wide range of essential plant nutrients, making it an excellent fertilizer for all crops. Fertilization should stop three weeks before the crop is harvested. This section provides a range of best practices for fertilizing crops. Choose the method that is most appropriate for your farm. Crop specific applications can be found in the appendix.

Perennial crops (e.g. banana, coffee, fruit trees and shrubs, nut trees)

1. Basin (useful on flat ground)

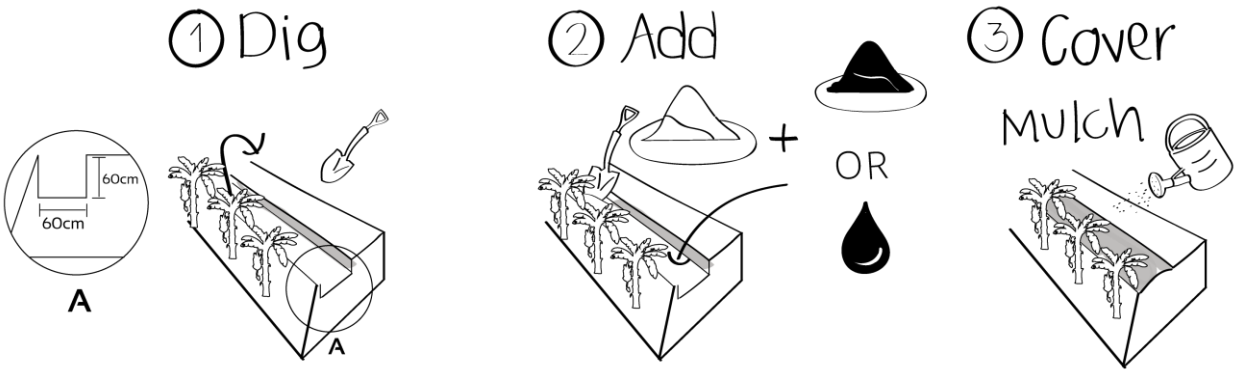


Dig a small trench around the plant, at least 60cm (2 feet) from the base.
Note: *We dig 60cm away from the plant to avoid injuring the roots*

Mix soil with biofertilizer or compost.
Note 1: *Dilute biofertilizer in ratio of 1:1 for fruit trees <2 years to limit plant damage*
Note 2: *Apply undiluted biofertilizer on mature fruit trees (3 + years)*

Cover with mulch

2. Covered trenches (useful on slopes)



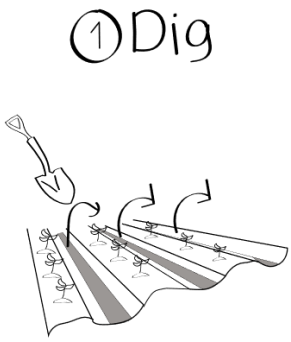
Dig 60cm x 60cm

Mix soil with biofertilizer or compost

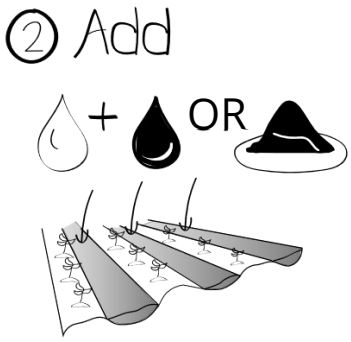
Cover with mulch and add water

Annual crops (e.g. maize, cereals, napier grass, and vegetables)

1. Covered trenches



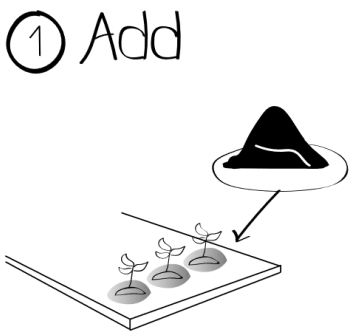
Dig between rows



2 water : 1 biofertilizer
OR 1 compost

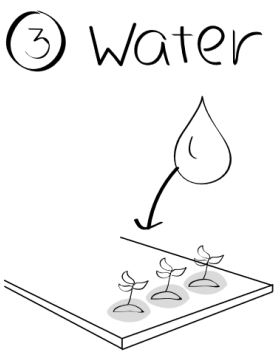
Cover with soil and mulch

2. Top dressing



Add compost

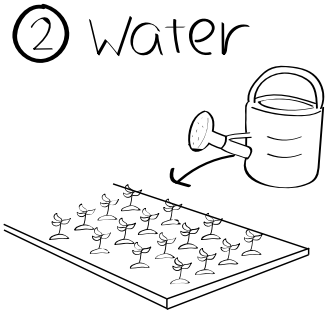
Mix with soil



Add water

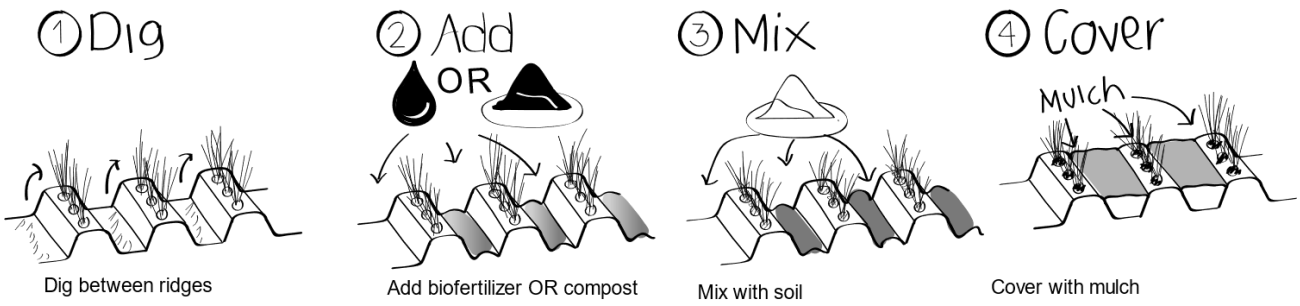
3. Applying with watering can – best during late stage growth when there is limited space between rows

Mix 2 water : 1 biofertilizer



Apply diluted biofertilizer

Sugar cane & fodder crops (e.g. Napier grass, or Brachiaria grass)



Tea plantations and other dense crops

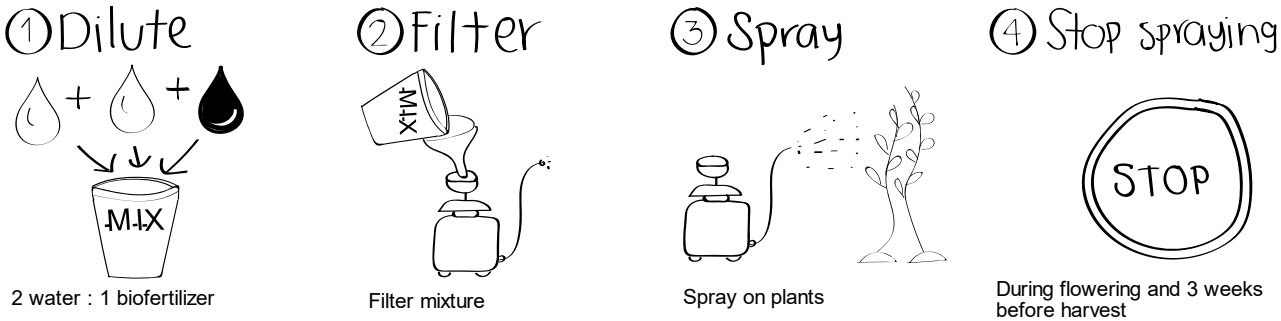
Due to the close spacing of tea plants, napier grass and some cereal crops, it is often difficult to use the methods above as they require biofertilizer to be physically mixed with the soil.

In such cases, biofertilizer can be applied using a 1-inch hosepipe or poured directly using a bucket. On grass fields, biofertilizer can also be applied using irrigation sprinklers. Alternatively, canals or trenches can be dug to allow biofertilizer to be distributed using gravity or a pump system.

Speak with your technician about installing an irrigation or canal system. Biofertilizer should be diluted 1:1 - 1:3 with water if using these methods in order to maximize soil penetration and avoid nutrient losses.

All crops (annuals & perennials)

1. *Foliar feeding*



End of section: CROP FERTILIZATION

PEST & DISEASE MANAGEMENT

Liquid biofertilizer can be used as a biopesticide to help prevent and combat pests and fungal diseases. In combination with appropriate fertilization and seed soaking, this can help reduce the need for chemical pesticides. **Do not spray flowering crops and stop spraying three weeks before the crop is due to be harvested.**

Foliar applications of biopesticide have proved effective in helping prevent and reduce damage caused by a wide range of pests and diseases, for example:

- Fall armyworms
- Stem/stalk borer
- Diamondback Leaf Moth
- Aphids
- Red spiders
- Termites
- Banana Weevil
- Mealy bugs
- Leaf Weevil
- Rice Weevil
- Cutworms
- Tomato root knot nematode
- Soybean cyst nematode
- Fusarium
- Rice mildew
- Rice helminthosporium
- Citrus Black Spot fungus
- Wheat scab fungus
- Banana Bacterial Wilt
- Rice sigmoideum
- Wheat Gibberella Disease
- Moles

All crops (annuals & perennials)

1. *Biopesticide preparation*

Put 1 volume biofertilizer into a permeable sack. You can also crush and add neem (mwarubaine) tree leaves (10 leaves/liter) to improve the biopesticide effect.

Add 2 parts water to bucket

Agitate daily

Apply the solution on the soil to eradicate root knot nematodes using neem tree leaves. The solution can also be used as foliar application.

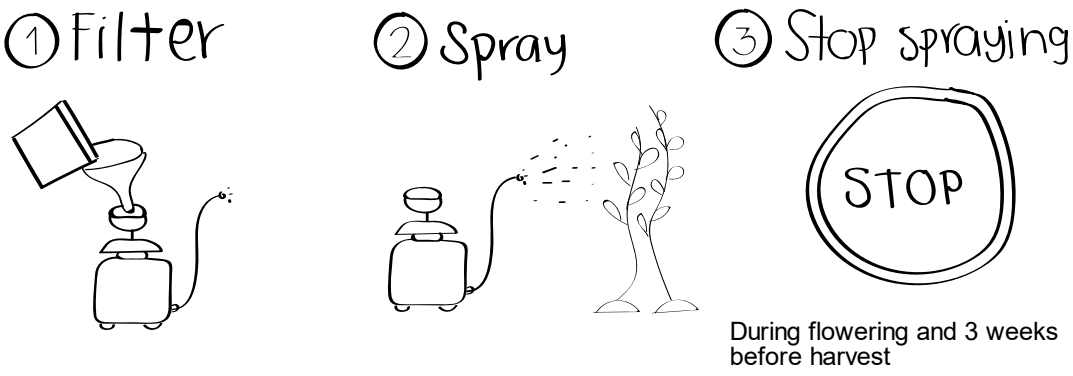
OPTIONAL: The foliar pest spray can be made even more effective by adding chili, garlic, and insect repellant plants to the mixture before soaking:

Chop:
200g garlic
200g chilies

Crush 1 handful of:
Mexican Marigold (Tagetes Minuta)
Mexican Sunflower (Tithonia Diversifolia)

Add: All ingredients plus a teaspoon of regular dish soap to the biofertilizer sack, which will act as a binding agent.

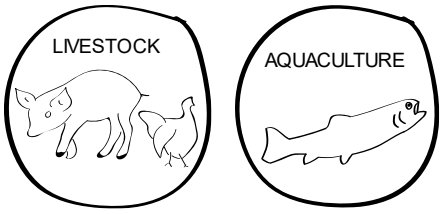
Biopesticide foliar application



OPTIONAL: if you do not have a knapsack sprayer, you can dip leaves in the biopesticide and use them to drizzle the liquid on your crops.

End of section: PEST & DISEASE MANAGEMENT

ANIMAL FEED

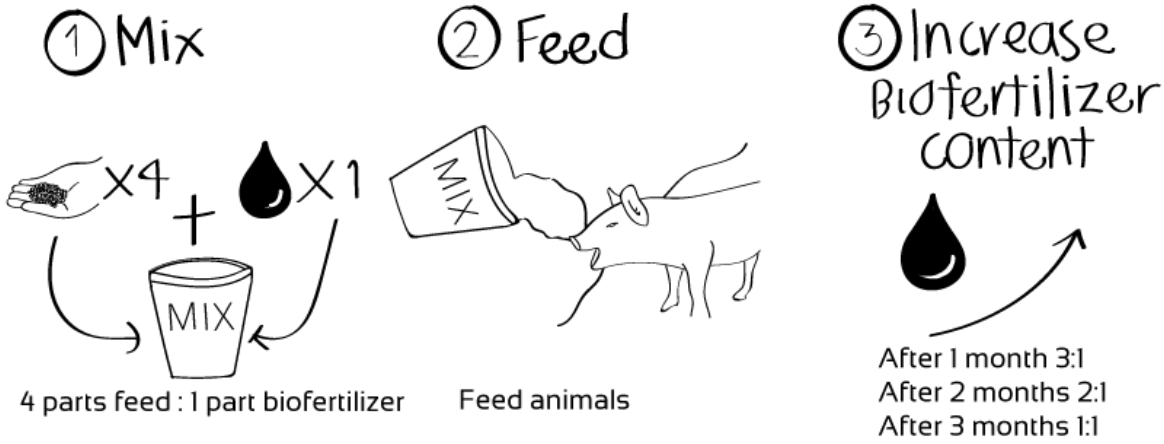


Biofertilizer can be used to add value to pig and chicken feed and as a feed for fish farming. Mixing biofertilizer reduces feed costs and can improve weight-gain and overall animal health. Biofertilizer should not be fed to cattle, sheep or goats.

Caution!

Only use biofertilizer from cow and pig systems to feed the poultry and only use cow biofertilizer to feed pigs.

Pigs

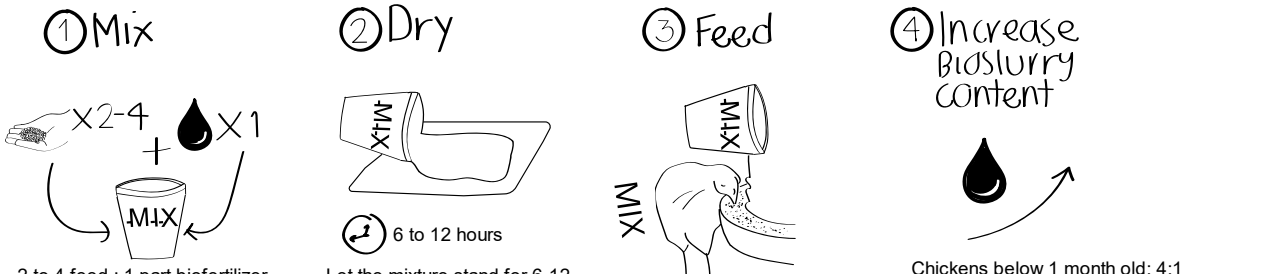


4 parts feed : 1 part biofertilizer

Feed animals

Supplementing pig feed with biofertilizer can lead to increased weight gain.
Reduce biofertilizer use if pigs experience diarrhea. Do not feed biofertilizer to pigs under 20kg.

Chickens



2 to 4 feed : 1 part biofertilizer

Let the mixture stand for 6-12 hours to allow pre-digestion of the feed while it is drying

Feed animals

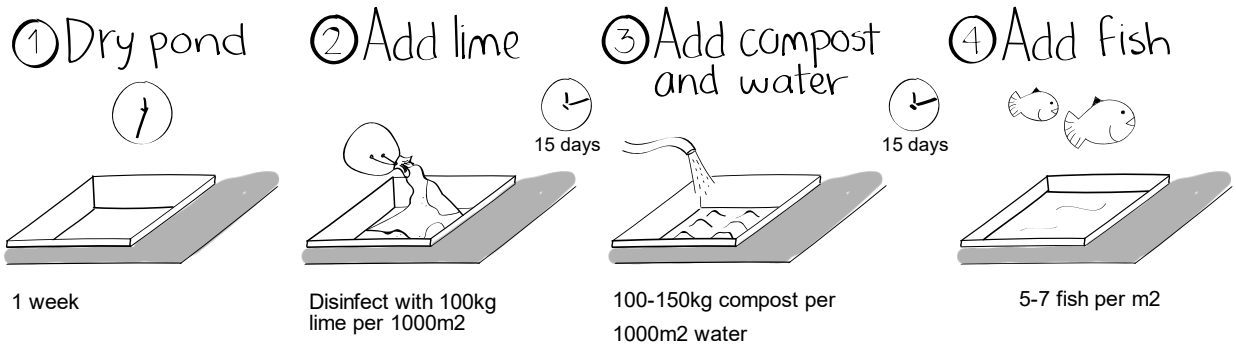
Chickens below 1 month old: 4:1
Chickens between 1 and 2 months old: 3:1
Chickens older than 2 months: 2:1

Supplementing chicken feed with biofertilizer can lead to increased weight gain and egg laying. *Reduce biofertilizer use if chickens experience diarrhea.*

Fish

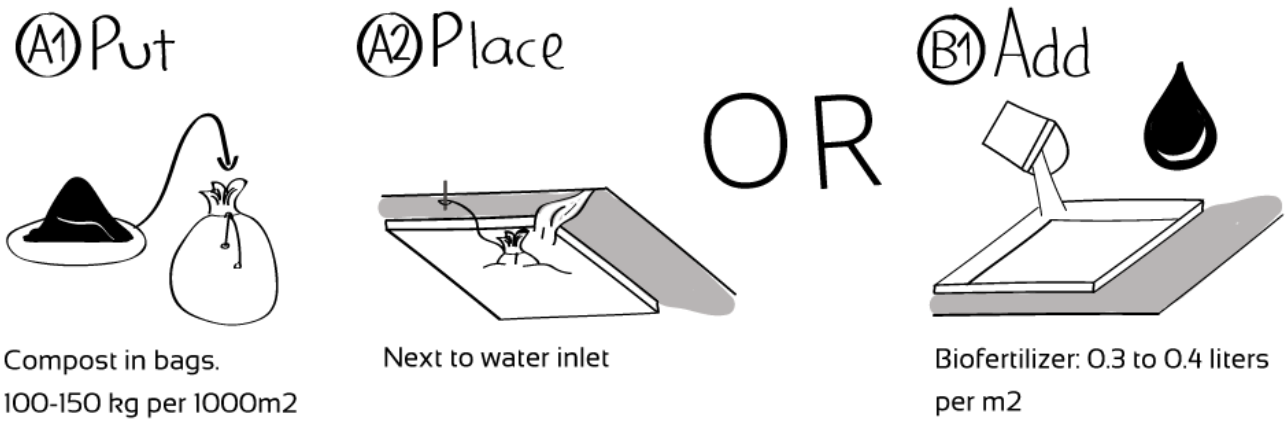
Biofertilizer is an excellent feed for fish (especially tilapia and catfish) and also increases the growth of organisms such as algae that fish feed on. It is important to properly prepare the pond before using biofertilizer as feed.

1. *Pond preparation*



2. *Feeding*

Never use raw manure to feed your fish as it can lead to fish death.



End of section: ANIMAL FEED

Appendix: **CROP SPECIFIC APPLICATION RATES**

This section offers suggested quantities of biofertilizer for specific crops. These quantities are based on experiences from farmers around the world who have benefitted from the use of biofertilizer. Experiment with your biofertilizer and see what works for your farm. Then spread the news and tell farmers in your area!

Measurements

To make using biofertilizer easy, application rates are given in simple measurements.

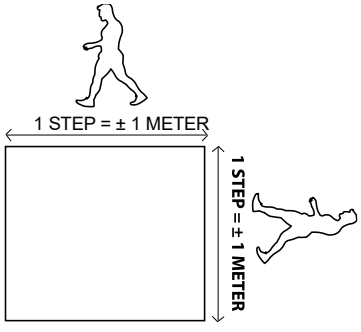
- Quantities of biofertilizer are given as the number of buckets (20 liters) required.

1 BUCKET = 20 LITERS

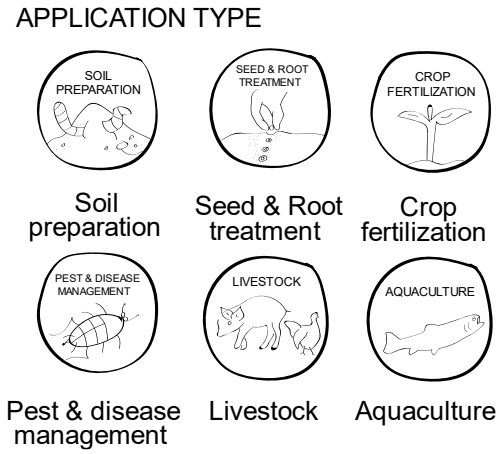
- The space over which biofertilizer is applied is provided in terms of how many steps along the planting row you should move —this is approximately one meter.

1 STEP ± 1 METER

- Application rates are sometimes given in buckets per square meters (M2). You can use a bucket (20 liters) to measure a square meter as the following diagram shows:



Drawing guide



VEGETABLES

The following quantities are based on farmer experiences growing the following vegetables: radish, carrot, garlic, ginger, turmeric, potatoes, peanuts, beetroot, spinach, broccoli, kale, lettuce, cabbage, eggplant, tomatoes, peppers, chilies, pumpkin, squash, cucumber, melons, zucchini, beans, peas, lentils, pigeon peas, gram and soy bean. Experiment with your biofertilizer to find out what is best for your soil, climate, and crops.

Prepare soil 2 days before planting

		ROOTS	LEAFY GREENS*	FRUITING VEGETABLES**	GOURDS AND SQUASHES	LEGUMES
COVERED TRENCHES	+	2-3 BUCKETS PER STEP	2-3 BUCKETS PER STEP	2-3 BUCKETS PER STEP	2-3 BUCKETS PER STEP	1 BUCKET PER 4 STEPS
		1-2 BUCKET PER STEP	1-2 BUCKET PER STEP	1-2 BUCKET PER STEP	1-2 BUCKET PER STEP	1 BUCKET PER 4 STEPS
MIX & MULCH		2-3 BUCKETS PER M²	2-3 BUCKETS PER M²	2-3 BUCKETS PER M²	2-3 BUCKETS PER M²	1 BUCKET PER 4 STEPS
PLANTING PITS	+	-	1 BUCKET PER 4 PITS	1 BUCKET PER 4 PITS	1 BUCKET PER 4 PITS	-
		-	4 HANDFULS PER PIT	4 HANDFULS PER PIT	4 HANDFULS PER PIT	-

SEED SOAKING		20 MINS	20 MINS	30 MINS	30 MINS	UP TO 24 HOURS

COVERED TRENCHES	QUANTITY:	1 BUCKET PER 4 STEPS	1 BUCKET PER 4 STEPS	1 BUCKET PER 4 PLANTS	1 BUCKET PER 4 PLANTS	1 BUCKET PER 20 STEPS
+	TIMING:	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 15 DAYS AFTER FIRST FLOWER*	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 45 DAYS*
TOP DRESSING	QUANTITY:	-	4 HANDFULS PER PLANT	4 HANDFULS PER PLANT	4 HANDFULS PER PLANT	-
	TIMING:		*WHEN PLANTING SEEDLING*	*WHEN PLANTING SEEDLING*	*WHEN PLANTING SEEDLING*	-
WATERING CAN	QUANTITY:	1 BUCKET PER 4 STEPS	1 BUCKET PER 4 STEPS	1 BUCKET PER 4 PLANTS	1 BUCKET PER 4 PLANTS	1 BUCKET PER 20 STEPS
+	TIMING	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 15 DAYS AFTER FIRST FLOWER*	*EVERY 15 DAYS AFTER 1ST MONTH*	*EVERY 45 DAYS*
FOLIAR FEEDING	QUANTITY:	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 30-50 STEPS
+	TIMING:	*1 TIME PER SEASON*	*1 TIME PER SEASON*	*1 TIME PER SEASON*	*1 TIME PER SEASON*	*1 TIME PER SEASON*

Do not spray crops in first month of growth or during flowering

FOLIAR SPRAY	QUANTITY:	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS	1 BACKPACK EVERY 10-20 STEPS
	TIMING:	*2-3 TIMES 20 DAYS APART*	*2-3 TIMES 15 DAYS APART*	*3-4 TIMES 20 DAYS APART*	*2-3 TIMES 15 DAYS APART*	*2-3 TIMES 15 DAYS APART*

REMEMBER: STOP APPLYING 3 WEEKS BEFORE HARVESTING.

**Leafy greens include: lettuce, spinach, cabbage, kale and broccoli.*
***Fruiting vegetables include: tomatoes, eggplant, chilies, and peppers.*

GRAINS

The following quantities are based on farmer experience. Experiment with your biofertilizer to find out what is best for your soil, climate, and crops.

			MAIZE	OATS, WHEAT, BARLEY, MILLET	RICE	SORGHUM
SOIL PREPARATION	COVERED TRENCHES	+	1 BUCKET PER STEP	1 BUCKET PER STEP	1 BUCKET PER 4 STEPS	1 BUCKET PER 2 STEPS
			-	-	1 BUCKET PER 2 STEPS	-
	MIX & MULCH		2-3 BUCKETS PER M2	2-3 BUCKETS PER M2	1/2 BUCKET PER M2	2-3 BUCKETS PER M2
Prepare soil 2 days before planting		+	-	-	¼ BUCKET PER M2	-
	PLANTING PITS	+	¼ BUCKET PER PIT	¼ BUCKET PER PIT	-	¼ BUCKET PER PIT
			4 HANDFULS PER PIT	4 HANDFULS PER PIT	-	4 HANDFULS PER PIT
SEED & ROOT TREATMENT	SEED SOAKING		8-12 HOURS	8-12 HOURS	12-48 HOURS	8-12 HOURS
	COVERED TRENCHES	QUANTITY:	1 BUCKET PER 4 STEPS	-	1 BUCKET PER M2	1 BUCKET PER 4 STEPS
CROP FERTILIZATION	+	TIMING:	*2-3 TIMES 15-20 DAYS APART*	-	-	*2 TIMES 15 DAYS APART*
	WATERING WITH HOSE PIPE OR OR +	QUANTITY:	-	BEFORE FLOWERING: 6 LITRES DILUTED (1:5) PER M2 AFTER FLOWERING: 10 LITRES UNDILUTED per M2	20 LITRES PER M2	-
		TIMING:	-	-	-	-
Do not spray crops in first month of growth or during flowering	FOLIAR FEEDING	QUANTITY:	1 BACKPACK EVERY 30-50 STEPS	1 BACKPACK PER 4-6 PLANTS	1 BACKPACK PER 8 PLANTS	1 BACKPACK EVERY 30-50 STEPS
	+	TIMING:	*1 TIME PER MONTH*	*2-3 TIME 15 DAYS APART*	*UP TO 8 TIMES PER SEASON*	*1 TIME PER MONTH*
PEST & DISEASE MANAGEMENT	FOLIAR SPRAY	QUANTITY:	1 BACKPACK EVERY 30-50 STEPS	1 BACKPACK EVERY 30-50 STEPS	1 BACKPACK EVERY 30-50 STEPS	1 BACKPACK EVERY 30-50 STEPS
		TIMING:	*SPRAY CROPS AS TREATMENT WHERE PEST OR DISEASE DAMAGE IS AN ISSUE.*			

REMEMBER: STOP APPLYING 3 WEEKS BEFORE HARVESTING.

FRUITS

The following quantities are based on farmer experience. Experiment with your biofertilizer to find out what is best for your soil, climate, and crops.

			SMALL FRUIT TREES	LARGE FRUIT TREES	BERRIES & GRAPES
SOIL PREPARATION	**PLANTATION PITS** *PREPARE SOIL 2 DAYS BEFORE PLANTING*		2.5 BUCKETS PER PIT	2.5 BUCKETS PER PIT	1 BUCKET PER PIT
			1/4 BUCKET PER PIT	1 BUCKET PER PIT	1 BUCKET PER PIT
SEED & ROOT TREATMENT	**SEED SOAKING**		24 HOURS	24 HOURS	24 HOURS
	STEM SOAKING		1 HOUR	1 HOUR	1 HOUR
CROP FERTILIZATION	**BASINS & COVERED TRENCHES** *NO APPLICATION LIMIT ON ACIDIC SOILS.*	1ST YEAR:	HALF BUCKET PER PLANT (1:10)	1/4 BUCKET PER PLANT (1:5)	¼ BUCKET PER PLANT
		2ND YEAR:	1 BUCKET PER PLANT (1:1)	1 BUCKET PER PLANT (1:1)	
		AFTER 2ND YEAR:	2.5 BUCKETS PER PLANT	2.5 BUCKETS PER PLANT	
		TIMING	ONCE BEFORE EACH SEASON		
	FOLIAR FEEDING	QUANTITY:	½ BACKPACK PER PLANT	¼ BACKPACK PER PLANT FOR FIRST 3 YEARS THEN, 1 BACKPACK	1/2 BACKPACK PER PLANT
		TIMING:	BEFORE FLOWERING OR ON FRUIT	BEFORE FLOWERING OR ON FRUIT	AFTER FLOWERING
PEST & DISEASE MANAGEMENT	**FOLIAR SPRAY**	QUANTITY:	½ BACKPACK PER PLANT	1 BACKPACK PER PLANT	1/2 BACKPACK PER PLANT
		TIMING:	BEFORE FLOWERING OR ON FRUIT	BEFORE FLOWERING OR ON FRUIT	AFTER FLOWERING

			BANANA	PINEAPPLE	CITRUS
SOIL PREPARATION	**PLANTATION PITS**		2.5 BUCKETS PER PIT	1 BUCKET PER PIT	1 BUCKET PER PIT
			1 BUCKET PER PIT	1/4 BUCKET PER PIT	1 BUCKET PER PIT
SEED & ROOT TREATMENT	**STEM SOAKING**		1 HOUR	1 HOUR	1 HOUR
CROP FERTILIZATION	**BASINS & COVERED TRENCHES** *NO APPLICATION LIMIT ON ACIDIC SOILS.*	QUANTITY AND TIMING:	0.5-2.5 BUCKETS PER PLANT EVERY 15 DAYS	0.5-2.5 BUCKETS PER PLANT EVERY 15 DAYS	1ST YEAR: ¼ BUCKET PER PLANT 2ND YEAR: 1 BUCKET PER PLANT AFTER 2ND YEAR: 1-4 BUCKETS PER PLANT
PEST & DISEASE MANAGEMENT	**FOLIAR SPRAY**	QUANTITY:	1/2 BACKPACK PER PLANT	1/2 BACKPACK PER PLANT	1/2 BACKPACK PER PLANT
		TIMING:	BEFORE FLOWERING OR ON FRUIT	BEFORE FLOWERING OR ON FRUIT	AFTER FLOWERING

REMEMBER: STOP APPLYING 3 WEEKS BEFORE HARVESTING.

COFFEE

The following quantities are based on farmer experience. Experiment with your biofertilizer to find out what is best for your soil, climate, and crops.

			COFFEE
	**PLANTATION PITS** *PREPARE SOIL 2 DAYS BEFORE PLANTING*		2.5 BUCKETS PER PIT
			1 BUCKET PER PIT
	SEED SOAKING		24 HOURS
	**BASINS & COVERED TRENCHES** *NO APPLICATION LIMIT ON ACIDIC SOILS.*	QUANTITY:	1 BUCKET PER PLANT
		TIMING:	ONCE BEFORE EACH SEASON
	**WATERING WITH HOSE PIPE** OR OR +	QUANTITY:	-
		TIMING:	
Do not spray crops in first month of growth or during flowering	**FOLIAR FEEDING** +	QUANTITY:	½ BACKPACK PER PLANT
		TIMING:	EVERY 2-3 WEEKS AFTER FLOWERING
	**FOLIAR SPRAY**	QUANTITY:	½ BACKPACK PER PLANT
		TIMING:	*SPRAY CROPS AS TREATMENT WHERE PEST OR DISEASE DAMAGE IS AN ISSUE.*

TEA

			TEA
	**PLANTATION PITS** *PREPARE SOIL 2 DAYS BEFORE PLANTING*		1 BUCKET PER 4 PITS
			1 BUCKET PER PIT
	SEED SOAKING		-
	**BASINS & COVERED TRENCHES** *NO APPLICATION LIMIT ON ACIDIC SOILS.*	QUANTITY:	-
		TIMING:	-
	**WATERING WITH HOSE PIPE** OR OR +	QUANTITY:	5 LITRES PER PLANT
		TIMING:	
Do not spray crops in first month of growth or during flowering	**FOLIAR FEEDING** +	QUANTITY:	1 BACKPACK PER 30 STEPS
		TIMING:	AT LEAST 15 DAYS APART
	**FOLIAR SPRAY**	QUANTITY:	1 BACKPACK PER 30 STEPS
		TIMING:	*SPRAY CROPS AS TREATMENT WHERE PEST OR DISEASE DAMAGE IS AN ISSUE.*

REMEMBER: STOP APPLYING 3 WEEKS BEFORE HARVESTING.

TOBACCO

Prepare soil 2 days before planting

COVERED TRENCHES	PLANTING PITS	COVERED TRENCHES	FOLIAR SPRAY
2.5 BUCKETS PER STEP	4 HANDFULS PER PIT	1 BUCKET PER FOUR STEPS EVERY 15 DAYS	1 BACKPACK EVERY 30 STEPS, MONTHLY

SUGARCANE

Prepare soil 2 days before planting

Do not spray crops in first month of growth or during flowering

MIX & MULCH	COVERED TRENCHES	FOLIAR SPRAY
1/4 BUCKET PER M2	1/2 BUCKET PER M2, EVERY 2 WEEKS	1 BACKPACK EVERY 30 STEPS, 15 DAYS APART

FODDER CROPS

(e.g. napier grass or brachiaria grass)

The following quantities are based on farmer experience. Experiment with your biofertlizer to find out what is best for your soil, climate, and crops.

COVERED TRENCHES			1 BUCKET PER 2 STEPS
			1 BUCKET PER 2 STEPS
ROOT SOAKING			8 HOURS
COVERED TRENCHES *NO APPLICATION LIMIT ON ACIDIC SOILS.*		QUANTITY:	1 BUCKET PER 2 STEPS
		TIMING:	ONCE PER WEEK
WATERING WITH HOSE PIPE OR OR +		QUANTITY:	20 litres PER 2 STEPS
		TIMING:	ONCE PER WEEK
FOLIAR FEEDING +		QUANTITY:	1 BACKPACK EVERY 30-50 STEPS
		TIMING:	EVERY 2 WEEKS

Do not spray crops in first month of growth or during flowering

REMEMBER: STOP APPLYING 3 WEEKS BEFORE HARVESTING.

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