CERCLE INTERNATIONAL POUR
LA PROMOTION DELA CREATION
Direction Générale

ONG d'Ecologie et de Développement Holistique

Notre monde : création de Dieu et responsabilité de l'Homme

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KNOWLEDGE HUB OF ORGANIC AGRICULTURE FOR CENTRAL AFRICA (KHCA)

OUTPUT A: COLLECTION AND PREPARATION OF KNOWLEDGE

KNOWLEDGE PRODUCT: ENRICHED INDIAN EFFECTIVENESS MICROORGANISM (EM)

Type of product: Biopesticide and biofertilizer
Category: Insect repellent, fungicide and nematicide
Form: Liquid
Cultivation: All speculation
Type of pests: Very broad spectrum
Use: Preventive and curative (to treat attacks)
Duration of persistence: 3 days before harvest

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2.1. Definition

The « enriched Indian EM » is a liquid product which help in fertilizing the soil and plants through growth and development of microorganisms (basidiomycetes, actinomycetes, yeasts, protozoa, bacteria…) in a controlled environment previously enriched with nutrients and active principles of organic origin, in more or less balanced proportions, and also in the same crops against pests and diseases (rust, alternaria, caterpillars, thrips, larvae...). The microorganisms are obtained from an identified source and placed in the right conditions for their cultivation for the benefit of the cultivated soil and the release of nutrients for the plant.

2.2. Importance

→ Restores life to the soil by providing microorganisms

→ Revitalizes the biological activity of the soil through the proliferation and multiplication of microorganisms

→ Improves the chemical properties of the soil by increasing the fertilization elements and the PH

→ Improves soil physical properties by changing soil structure and increasing porosity

2.3. Composition

Ingredient	Source and elements generally available
Microorganism	Cow purse, bokashi, rabbit droppings or any other source of microorganism
Protein	Cowpea flour, beans, wheat bran, molasses, bagasse
Nitrogen	Rabbit, beef, and/or fermented human urine at 21 days
Energy	Ripe banana, brown sugar, honey or any other concentrated sources of simple sugars
Potassium and calcium	wood ash
Detoxifying	Charcoal powder
Fertilizing biomass and biopesticide plants	Fresh leaf of Tithonia, Tagette, Neem, papaya leaf, sesbania, Crotalaria, Lemongrass
Manure	Droppings from laying hens obtained from organic farming, and from broiler chickens, slurry, etc.
Water	Rain or spring water

Image 1 : cow purse

Image 2 : scale

Image 3 : rabbit urine

Image 4 : fresh tithonia leaf

Image 5 : Can of 20 litres

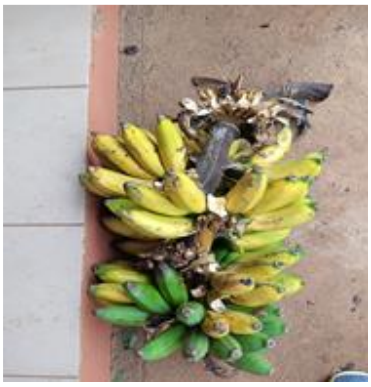

Image 6 : ripe banana

2.4. Material

- ✓ Mortar
- ✓ Fine sieve
- ✓ 20 L bucket with lid
- ✓ Cutlass
- ✓ Knife
- ✓ Basin

2.5. Manufacturing of 10 L of enriched EM

❖ **Step 1: preparation**

- slise 1kg of biomass at the rate of:

125g Tithonia	125 g Crotalia	125 g pawpaw leaf
125 g Targette	125 g Lemongrass	125 g Neem
125 g sesbania	125 g nettle	

Image 7: Biomass cutting

- Peel and pown 1 kg of ripe bananas
- Crush 1 kg of beans, soybeans or cowpeas
- Take 1 L of fermented rabbit, beef, cow or human urine at 21 days
- Weigh 250 g of wood ash
- Weigh 250 g of charcoal powder
- Weigh 250 g of manure
- Provide 10 L of water

Image 8 : bean flour

Image 9 : peeled banana

❖ **Step 2: Mixing**

* Knead the cow purse or the rabbit droppings with your hands using a quantity of the 10L of water available
* Pour the cow purse or kneaded rabbit droppings into the 20L bucket
* Knead bean or cowpea or soybean flour using an amount of 10 L of water
* Pour the kneaded flour into the 20 L bucket

* Add the mashed banana to the 20 L bucket
* Add wood ash
* Add the charcoal powder
* Add rabbit or cow or beef urine
* Add manure
* Pour the remaining water into the 20 L bucket
* Stir the whole mixture clockwise for 5 min
* Stop turning when the mixture is homogeneous
* Close the bucket with its lid
* Place the bucket in a dark place away from light

Image 10 : Kneading the cow purse

Image 11 : kneading the bean flour

Image 12: Add banana, bean flour and stir the

❖ **Step 3: Follow-up**

- Stir the mixture in the morning in a clockwise direction
- Stir the mixture in the evening in the opposite direction to that of the morning
- Repeat the exercise every day for 10 days

Image 13: Stir the mixture clock wise

❖ **Step 4: Conditioning**

- After 10 days, filter the product
- Poured the products obtain in plastics bottles of 1liter or container of 5l
- Lock the bottles or container hermetically

Image 14 : Product obtained at 10 days

Image 15: EM filtered and packaged in 5 L cans

❖ **Step 5: conservation**

- Store bottles or cans in a dark hallway away from light
- Maximum shelf life: 03 months

❖ **Step 6: Application**

Fertilization

- As a foliar fertilizer: Dilute 1 L of the manufactured product in 100 L of water, i.e. 225 ml for a sprayer. Spray once a month every 15 days

- As a biopesticide: Dilute 1 L of the product in 100 L of water. The product is applied every other day until flowering. For fruit trees, dilute 2 L of the product in 100 L of water and pour at the foot of the tree

Seed treatment

- Use 100 ml of the manufactured product for 1 kg of seed
- Spread the treated seed in the shade for 24 hours

2.6. Benefits

- Ingredients available and cheap
- Easy manufacturing
- Possibility of large scale production
- Easy storage
- Proven effectiveness
- 100% organic product

2.7. Disadvantage

- Discontinued availability of certain ingredients