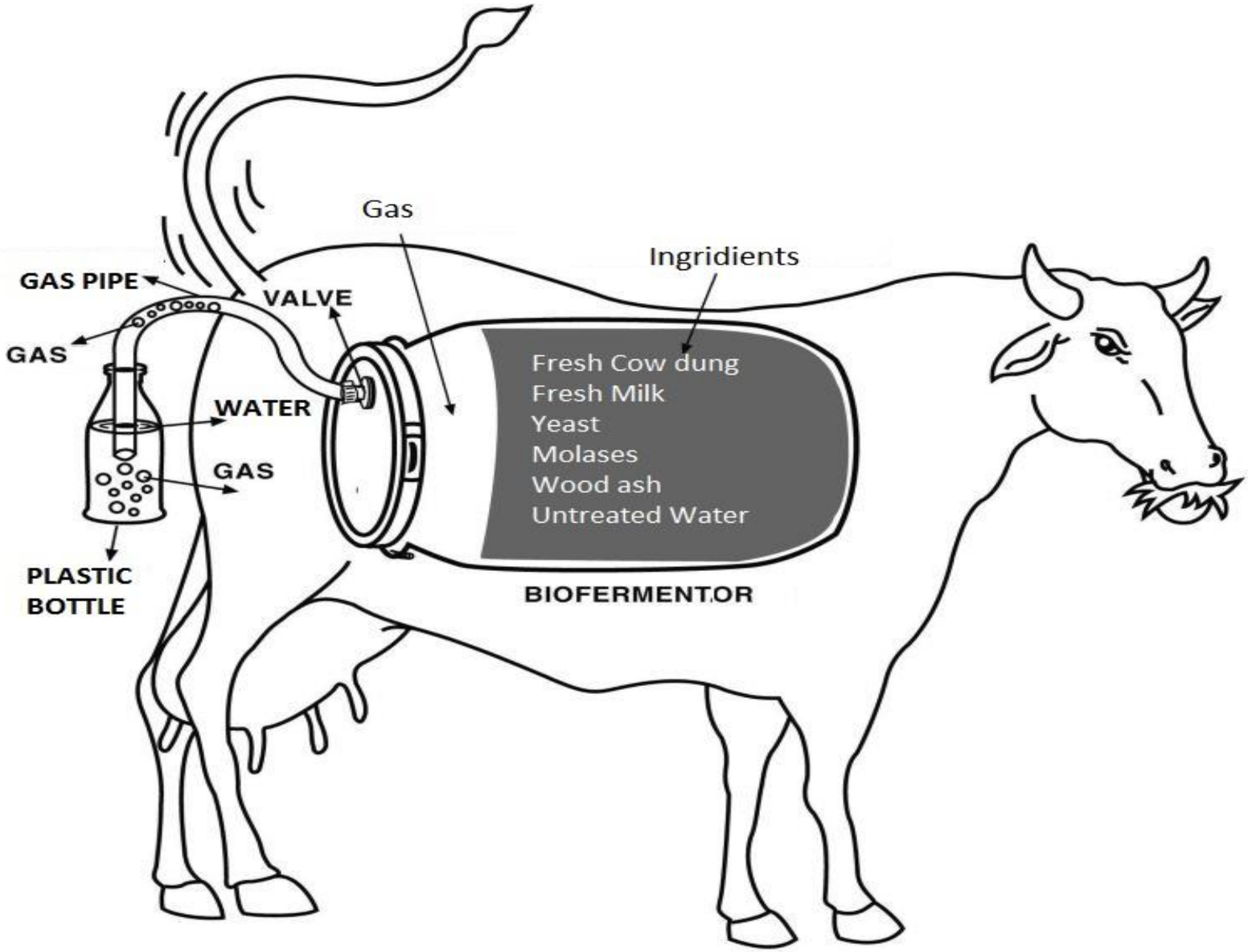
LIQUID BIOFERTILIZER




THE SHIT
OF 1 COW
FERTILIZATION
& NUTRITION OF
10
HECTARES
PROCESSED
COW SHIT
FERTILIZATION
& NUTRITION OF
50
HECTARES
SAVING = 25 TONNES OF CHEMICAL FERTILIZERS

Human uses

EGYPTIAN

Keen practitioners of fermentation

(Alcoholic beverages, bread)

Louis Pasteur *(1850s)*

Showed that fermentation is initiated by living organisms

What's Fermentation?

The chemical breakdown of a substance mainly by bacteria and/or yeasts; usually with the absence of Oxygen

...so...what's going on?

Converts complex molecules into more easily digestible forms to use by other organisms (microbes, plants, humans...)

What do we do when we are fermenting?

Create & preserve nutrients (Vit B, Org Acids, hormone,….)

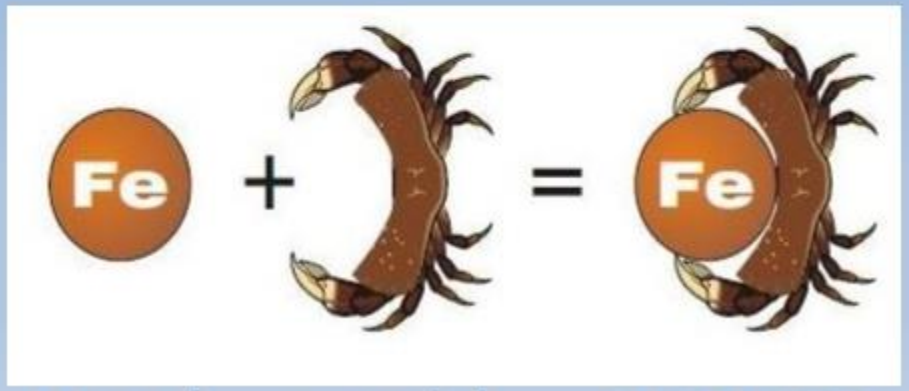
Removing Toxins!!!

Improve bioavailability of minerals presents

Final product is stable (we can store it)

CHELATIONS

The Cations are covered by acids (ring structure), therefore they lose the availability to react with other compounds, making it easy for them to go into plant cells.



Metal + acid = CHELATE

- Not in extreme condition
- Liquid medium

Why are Biofertilisers successful?

Contribute:

1 **microbes**

Restore the soil's natural nutrient cycle and build soil organic matter

2 **Compounds**

Stimulate plant growth, decrease pest incidence, stimulate composting and ameliorate the soil, **Mineral Chelation**

3 **Energy**

For perform metabolisms in nature

WHAT IS BIOFERTILIZERS ?

- They are liquid super-fertilizers with a lot of balanced energy in mineral harmony, prepared using very fresh cow dung,dissoved in water and;
- Enhanced with whey or milk, ash phosphates and molasses, Yeast
- That has been left to ferment for several days in a plastic drum in anaerobic system.

BIOFERTILIZER MINI FACTORY

BENEFITS OF DOING BIO-FERTILIZER AT HOME

- LOW INVESTMENT (INGREDIENTS & EQUIPMENTS}
- EASY TO GET INGREDIENTS (EVEN FOR FREE}
- COMMON SENSE TECHNOLOGY
- POSIBILITY TO COMBINE WITH OTHER LAND MANAGEMENT

WHY MUST WE LEARN TO PREPARE BIO-FERTILIZER ?

a) Due to independence the farmers obtain in short term

b) Very cheap since need to use resources generated by farm itself

Dung ,milk,urine,bone whey, ash

WHY MUST WE LEARN TO PREPARE BIO-FERTILIZER ?

C) To break dependence of inputs such as fertilizers and chemicals that cause economic vulnerability as their prices constantly rise

- d) Due to the efficiency and effectiveness when we consider or measure the productivity achieved in short term compared to resources invested

- F) It is a technology that improves the natural resources

- G) Because bio-fertilizers are easy technology to adapt under difficult conditions in field, which may exceed and as productive as the conventional ones that only works under optimal climate conditions and depend on inputs.

- Because it is a healthy technology that strengthens the mineral diversity of food that is richer in minerals,proteins,and vitamins etc;Therefore improves farmers nutrition.

WHAT ARE BIOFERTILIZERS FOR?

- NOURISH,RECOVER,AND REACTIVATE LIFE IN SOIL

WHAT ARE BIOFERTILIZERS FOR?

- Stimulate crop protection against pests and diseases

WHAT ARE BIOFERTILIZERS FOR?

- Replace or totally eliminate use of highly soluble industrial chemical fertilizers which are expensive and make peasants farmers
- dependent
- Increasingly poorer

HOW DO BIOFERTILIZERS WORK ?

- They work inside the plants by;
- Activating strengthening of nutritional harmony as mechanism to defend them
- Through;
- Organic acids, growth hormones,enzymes,amino acids,sugars,complex vitamins.
- Chemical and physical reactions that take place between the plant and soil

AS SOURCE OF NUTRIENTS,WHAT DO BIO –FERTILIZERS CONTAIN ?

- ELEMENTS
- PHOSPHOROUS
- SODIUM
- LITHIUM
- SELENIUM
- IODINE
- NITROGEN
- POTTASIUM
- SADIUM
- SULPHUR
- MAGNESIUM
- CALCIUM
- SODIUM

VITAMINS

VITAMINS

- THIAMIN
- PYODOXINE
- NICOTINIC ACID
- RIBOFLAVIN
- CABALAMIN
- ALPHA AMAYLASE
- AMINOCYLASE
- PROVITAMIN A

- ORGANIC ACIDS
- ACONITIC
- CAROLIC
- FUMARIC
- GLAUCIC
- CITRIC
- GENTISIC
- KOJIC

WHAT MATERIALS ARE PERMANENTS IN PREPARING BIO-FERTILIZERS?

1) PLASTIC DRUM WITH METAL RING **VALVE**

2) VALVE

A

IRRAGATION

TERMINAL COUPLING MAY BE USED

- A METAL/PLASTIC VALVE OR A PIECE OF SCREW THREADED NIPPLE MORE OR LESS
- 7 CM LONG AND 3/8---1/2 INCH DIMETER FITTED TO THE LID TO ALLOW GAS TO BE RELEASED WHEN IT FORMS IN THE DRUM

HOSE PIPE

2 FT LONG AND 3/8 TO ½ INCH IN DIAMETER,ATTACHED TO THE VALVE OR NIPPLE BY A JUBILEE CLIP

- WOODEN STICK
- Used to stir the ingredients

BASIC MATERIALS USED TO MAKE BIOFERTI;LIZERS ANYWHERE.

FRESH COW DUNG

FUNCTIONS

Provide live ingredients (micro-organisms---*Bacillus subitilis*) for fermentations to take place- Others include protozoa,bacteria, fungi which are responsible of ;

- Digesting,metabolising,all the nutritional elements into format that is available to plants.

Cow dung micro biology has the advantage of developing both aerobically and anaerobic ally.

- NB;COW DUNG SHOULD NOT BE SCORCHED BY SUNLIGH OR RAINED AT

WATER

NB.Only water without chlorine or chemicals should be used.

- PROVIDE A LIQUID MEDIUM WHERE BIO ENERGETIC AND CHEMICAL REACTIONS OF BIOFERTILIZERS ARE MULTIPLIED
- MICROORGANISMS LIVES MORE UNIFORMLY IN LIQUID MASS
- VITAMINS,ENZYMES,PEPTIDES,GROWTH PROMOTERS ARE EASILY TRANFFERED IN LIQUID

MILK/whey

- PROVIDES PROTEINS,VITAMINS,FAT AND AMINOACIDS TO FORM OTHER COMPOUNDS THAT ARE GENERATED DURING FERMENTATION PERIOD
- ALSO PROVIDES FERMENTATION MICROBIOLOGY

MOLASSES/SUGAR CANE JUICE

- PROVIDE NECESSARY ENERGY FOR MICROBIOLOGICAL METABOLISMS
- PROVIDE MINERALS AT LOWER SCALE SUCH AS MINERALS,---CALCIUM,POTTASIUM,PHOSPHOROUS,BORON,IRON,SULPHUR,MANGANESE,ZINC,AND MAGNESIUM.

ASH OR PHOSPHITE

Phosphites

- ITS MAIN FUNCTION IS TO PROVIDE MINERALS AND TRACE ELEMENTS TO THE BIOFERTILIZERSTO ACTIVATE AND EN RICH FERMENTATION.
- BEST SOURCE OF ASH IS THAT FROM PLANT OF GRAMINICEAE FAMILY— SUGARCANE,RICE HULLS,BAMBOO,MAIZE— Rich in sulphates and minerals

MINERAL SALTS

- ACTIVATE AND ENHANCE FERMENTATION
- NOURISH THE SOIL AND FERTILIZE THE CROPS.
- NB;This may be fully replaced by ash

INCLUDE;
COPPER,ZINC.IRON ,MAGNESIUM.

WHAT ARE BASIC QUANTITIES OF EACH INGREDIENTS TO PREPARE 200LTRS BIO-FERTILIZERS?

INGREDIENTS	QUANTITIES	COST-KSH
WATER (UNTREATED)	180LTRS	NIL
MILK OR WHEY	2 LITRES MILK 4 LTRS WHEY	100--50
MOLASSES (OR CANE JUICE)	2 LITRES LITRES MOLLASES 4 LITRES JUICE	50
VERY FRESH COW DUNG	50 KILOS	NIL
WOOD ASH OR PHOSPHITE	3 TO 5 KILOS	NIL
MINERAL SALTS(OPTIONAL)	ACCORDING TO CROPS REQUAREMENTS	---

WHEN ARE BIO-FERTILIZERS READY FOR APPLICATION TO CROPS AND THE SOIL

- READY WHEN ;
- After preparing most active fermentation anaerobic fermentation period of cow dung stops-no more bubbles seen on hose pipe or bottle I.e. 15 to 20 days after preparation
- NB 1st stage is followed by Aging that takes 2-3 months-the longer it age the higher the quality.

HOW LONG DOES FERMENTATION TAKE FOR BIO-FERTILIZERS TO BE READY

- This depends on ones extent of skills and experience,
- GUIDELINES
- For simple Bio-fertilizers ....it takes 20 to 30 days
- For mineral Enhanced bio fertilizers it takes it takes 35 to 45 days
- Enhanced bio-fertilizers
- ADD zinc,magnisium,copper, cobalt,iron etc ..to the normal bio fertilizers.

HOW DO WE CHECK THE FINAL QUALITY OF BIO-FERTILIZERS (GOOD QUALITY)

- SMELL
- Good bio fertilizers gives a pleasant smell of alcoholic fermentation
- COLOUR
- Have white cream on the surface, while the liquid will have amber colour and translucent
- NB;Biofertilizers age with time and the longer the time the higher the quality.

How to apply them?

- Mornings or evenings when the stoma are open wider

- Upward underneath the leaves

- To maximize application: add an adherent
(1,5 kg ash, 125 gr soap, 2 lt molasses, 2 kg Aloe Vera per 100lt)

- The soil must has plenty org. Matter in order to stimulate microbial and mineral metabolisms

- END

HOW TO PREPARE BIO-FERTILIZERS

STEP 1

IN 200 ltrs plastic drum dissolves50kg fresh cow dung and 4kg wood ash in 100 ltrs of uncontaminated water.

Stir them until obtaining a homogenous mixture.

Where possible collect fresh cow dung early in the morning because better results are obtained from bio-fertilizers

HOW TO PREPARE BIO-FERTILIZERS
STEP 2

Dissolve the two litres of milk or four litres of whey with the 2 litres of molasses in ten litres of uncontaminated water

Add them to 200 litres plastic drum where there is solution of cow dung and wood ash.

Stir thoroughly

HOW TO PREPARE BIO-FERTILIZERS
STEP 3

TOP UP THE FULL VOLUME OF PLASTIC DRUM CONTAINING THE INGREDIENTS WITH CLEAN WATER UP TO 180 LITRES OF ITS CAPACITY AND STIR.

HOW TO PREPARE BIO-FERTILIZERS
STEP 4

HERMATICALLY COVER THE DRUM TO START ANAEROBIC FERMENTING OF THE BIOFERTILISERS AND CONNECT THE GAS RELEASE SYSTEM WITH THE HOSE

WITH THE FERMENTED BIOPREP OBSERVE BUBLES IN THE BOTTLE

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HOW ARE BIO-FERTILIZER APPLIED TO CROPS AND SOIL....

AS Foliar Application ,Early morning up to 10.00 am or after 4pm –stomata are open wide

NB ADD adherent— soap,pricky pears,aloeveramollases,wheat flour

HOW ARE BIO-FERTILIZER APPLIED TO CROPS AND SOIL....

Can be applied on the soil-after tilling or planting

Through fertigation

WHAT QUANTITY OF BIOFERTILIZERS MAY BE APPLIED TO THE CROPS

Amount may depend on nutritional needs of each plant and stage of growth ,it is recommended to apply one litre in 20 litres of water

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

VEGETABLES IN NURSERIES

TWO APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF TWO TO THREE LITRES PER 20 LITRES OF WATER

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

VEGETABLE TRANSPLANTED IN THE FIELD

3 TO 6 APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF 1 LITRES TO 1.5 LTRS PER 20 LITRES OF WATER

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

FRUIT TREES IN NURSERIES

6 TO 8 APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF 1 LITRES TO 1.5 LTRS PER 20 LITRES OF WATER

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

FRUIT TREES,COFFEE OR PERENIAL CROPS

10 TO 15 APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF 1 LITRES TO 2 LTRS PER 20 LITRES OF WATER

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

ANNUAL CROPS
MAIZE AND BEANS

6 TO 8 APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF 750ML TO 1 LTRS PER 20 LITRES OF WATER

HOW FREQUENTLY BIO-FERTILIZERS APPLIED ?

FRUIT TREES,COFFEE OR PERENIAL CROPS

10 TO 15 APPLICATION OF BIO-FERTILIZERS,IN CONCENTRATION OF 1 LITRES TO 2 LTRS PER 20 LITRES OF WATER

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

USE OF LOCAL RESOURCES

VERY LOW INVESTMENT

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

Technology easily adopted by growers

Short term results are noted

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

Increased resistance to insects and disease attack

Perennial crop treated by bio fertilizers recover quickly

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

Longevity of perennial crops is increased

Increased quantity, size and vigour of the flowering

VISIBLE RESULTS ACHIEVED BY USE/ APPLYING BIO-FERTILIZERS

Increase in quantity, size and nutritional quality, aroma and taste of food

Economic savings achieved in short term due to replacement of chemical fertilizers

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

ELIMINATING TOXIC RESIDUE FROM FOOD

INCREASINGPROFITABILITY

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

INDEPEDENCE FROM COMMERCIALMANUFACTURERS DUE TO ADOPTING TECHNOLOGY

ELIMINATING WORKER HEALTH RISKS

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

CONSERVATION OF NATURAL RESOURCES

IMPROVING QUALITY OF LIFE OF RURAL FAMILIES

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

AN INCREASE IN THE NUMBER OF PROUCTIVE CYCLES PER CULTIVATED AREA --VEGETABLES

FRUITS AND VEGETABLES ARE CONSERVED FOR A LONGER PERIOD AFTER HARVEST

VISIBLE RESULTS ACHIEVED BY APPLYING BIO-FERTILIZERS

HOW MUST BIO-FERTILIZER BE PACKAGED AND FOR HOW LONG

STORAGE

- STORE IN A DARK CONTAINER EITHER FOR GLASS OR PLASTIC

- STORE FOR SIX MONTHS TO ONE YEAR