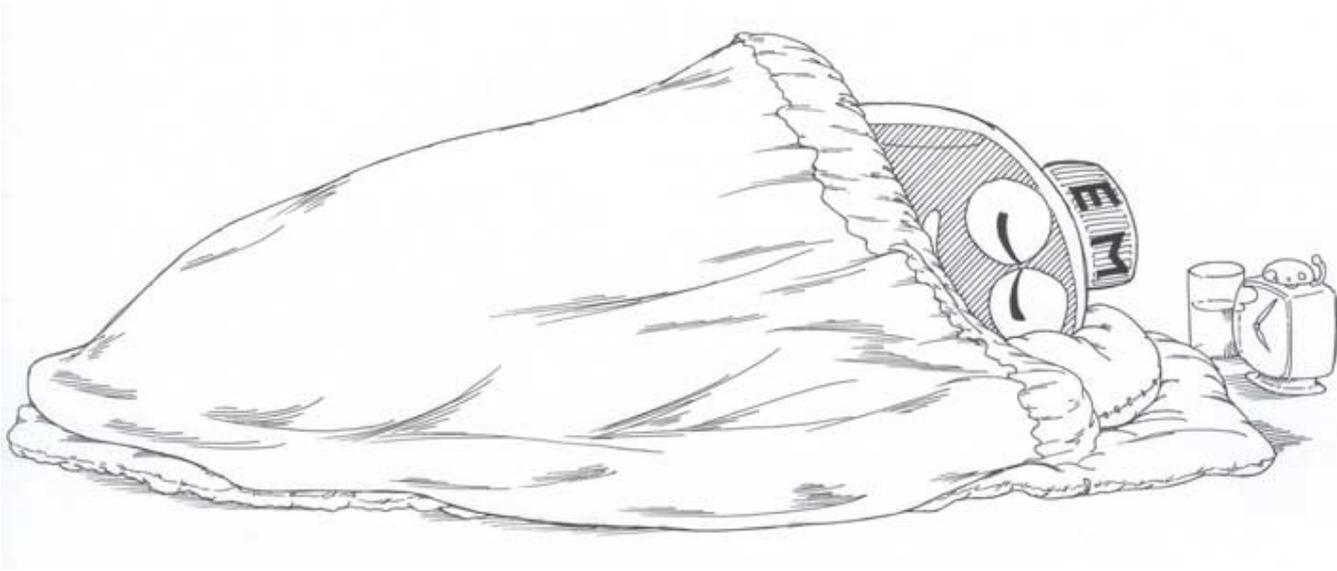


Robust Polycultures

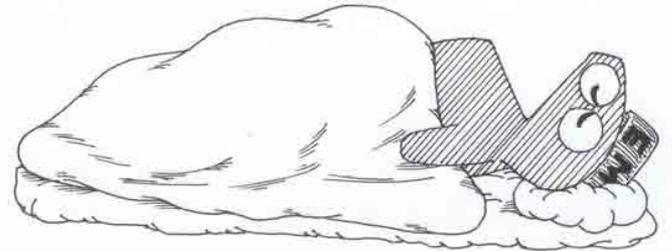
EM1
EME
FPE
FFE
EM5
EM7

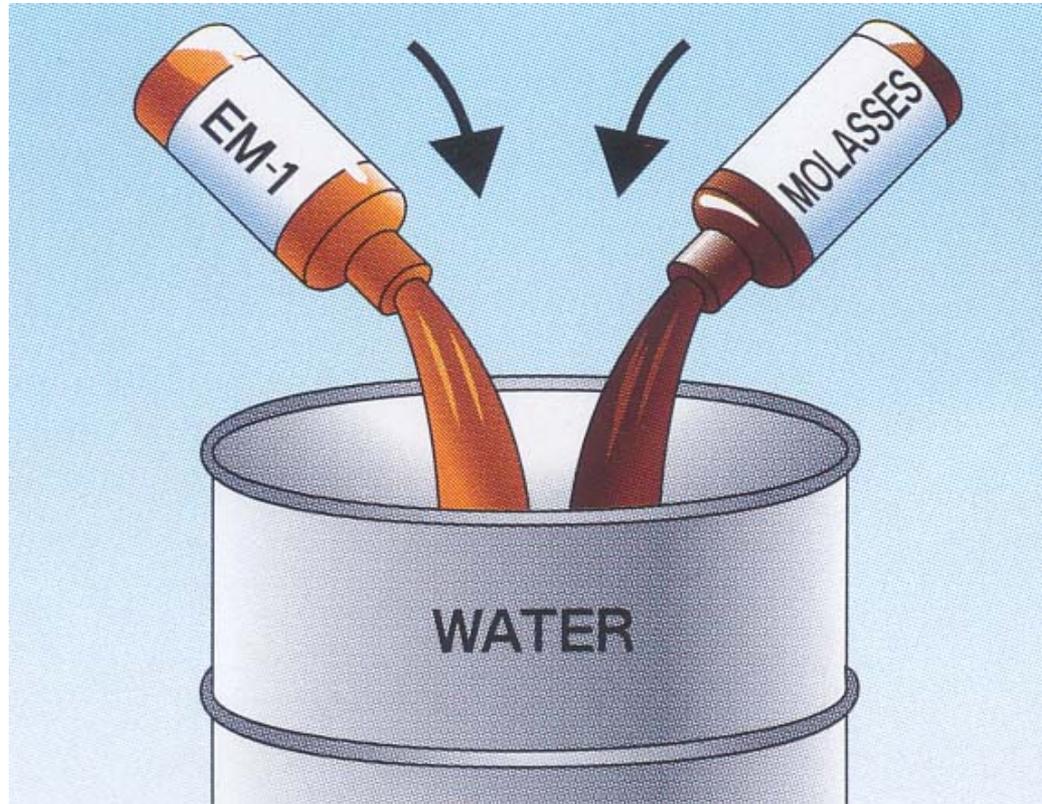




EM1 (original) is sleeping.

Microorganisms in EM1 are
in a dormant stage.





To activate sleeping microorganisms, give them:
food and a **house**.
(**livestock grade blackstrap molasses**)
(**water in an anaerobic condition**)

Always
Be scientific
Po!



EM Extended

Always
Be scientific!

Manual
Page 7

1. Calibration
 2. Dilution
 3. Fermentation
- Measure 30 ml EM1
(2 Table spoons)
Measure 30 ml molasses
(2 Table spoons)



EME Inoculation

Dilution Rate 1:500

EME 30 ml

Tablespoon
15 ml

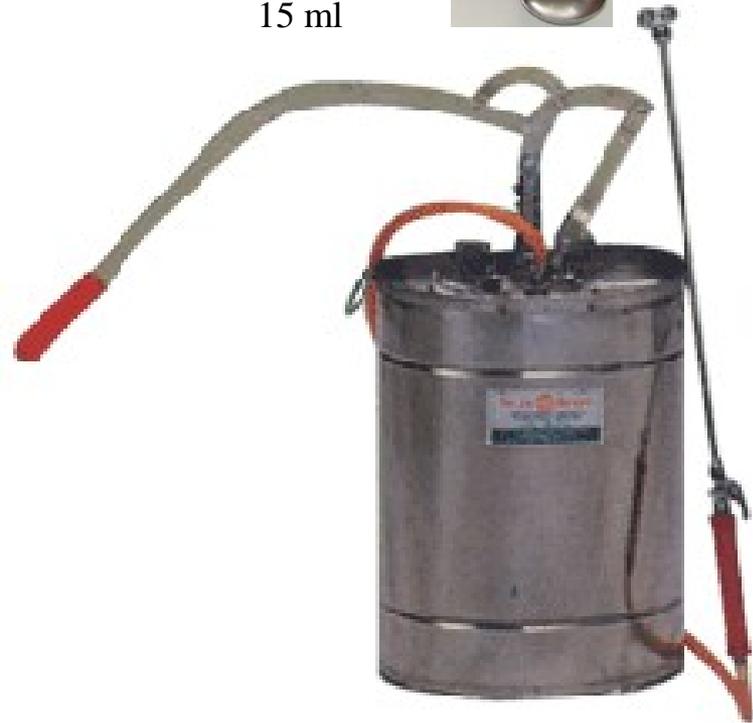


Tablespoon
15 ml

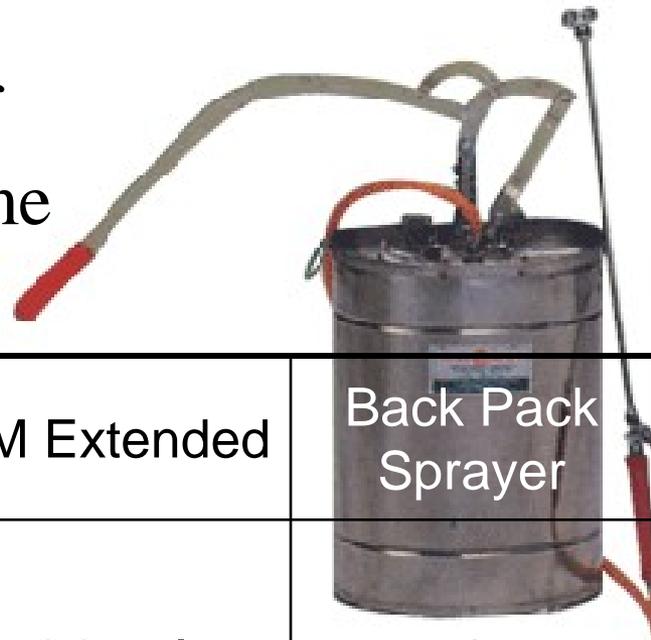


4 gallons X 3.8 L/g = 15 Liters

15 Liters = 15,000 ml /500= 30 ml

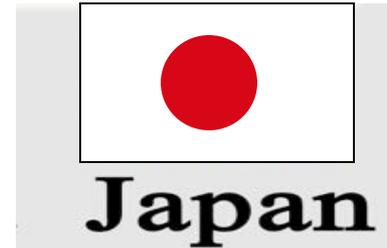


The Value of EM1 by volume



EM1	EM Extended	Back Pack Sprayer	Area	<u>Cost</u>
1 ml	30 ml	1	300 M ²	80 centavos
30 ml	1,000 ml (1 Liter)	33	10,000 M ² (1 hectare)	26 peso
1,000 ml (1 Liter)	30 Liters	1,000	30 hectares	800 peso

Inoculation Comparison



- Takes advanced management and time
- No guarantee of results
- Cultures can have contamination
- P 20-60/ backpack sprayer
- P600-P3,600/hectare

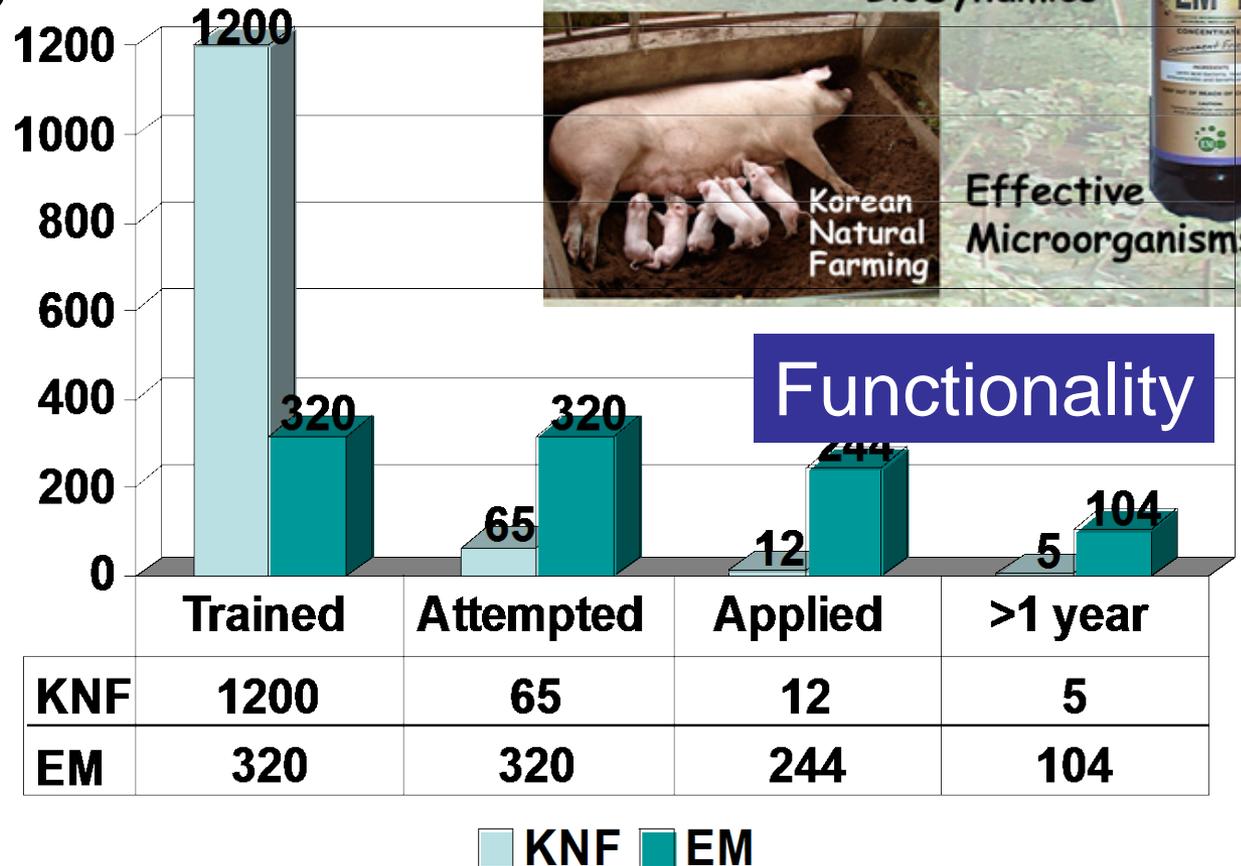
- Simple management
- Little time, easy
- Guaranteed results
- Cultures will be pure
- P 1/ backpack sprayer
- P 30/hectare

**Good System if
Sugar and rice are Free,
Lots of time to manage,
You are exacting and precise**

**Good System if
Sugar is Expensive,
Too busy for tedious propagation,
Want to save money**

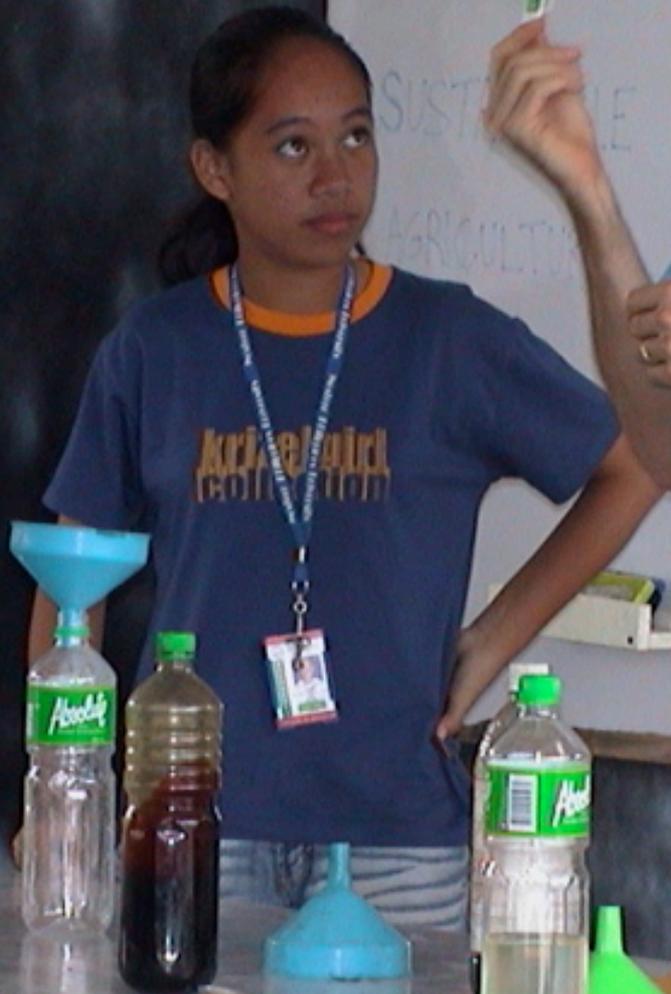
3 Fs to Sustainability

- Functionally Do-able
- Financially Viable
- Friendly on the Environment



EM Technology is Easy

Hands on
training



A photograph of a classroom. A male teacher in a light blue t-shirt with a tropical print and khaki shorts stands at the front, facing a group of students. The students, mostly young people, are seated in white plastic chairs, some with backpacks. They are looking towards the teacher. The room has large windows with metal grilles and a clock on the wall. The overall atmosphere is that of an active learning session.

Schools

Children can do it!

Learn to Propagate Microbes



Team Bokashi



Thurs.: 68
Fri.: 70
Mon.: 65
Tues.: 70
Wed.: 71

302

City Officials

EM F.R.W. Fermented Rice Wash

Hugas bigas

5 ml EME/5ml Molasses/Liter
Use compost, aquaculture water
Canals, septic tank

Not a consistent foliar fertilizer
(depends on water and rice ratio
and number times rinsing.





EM Livestock Bokashi



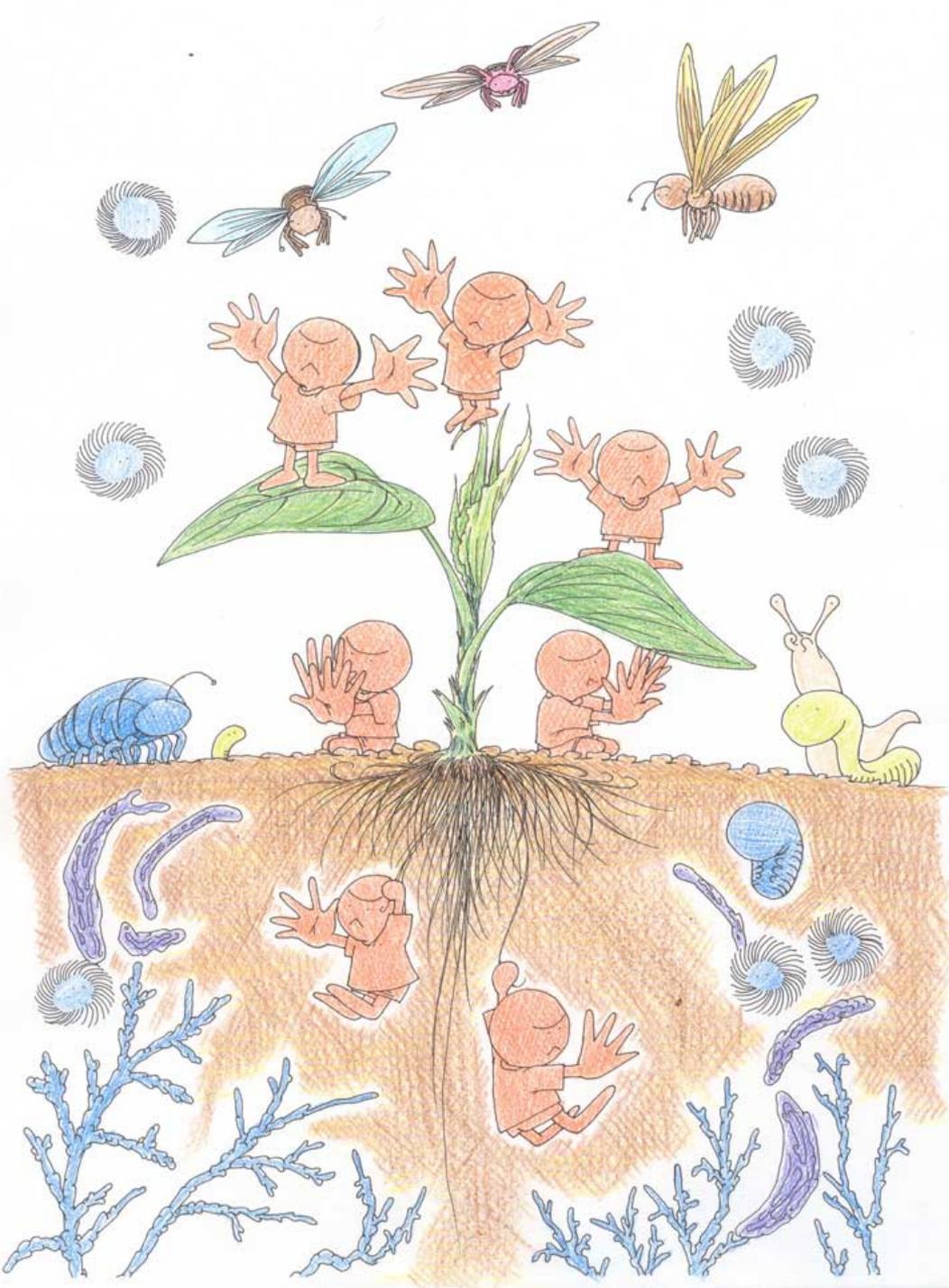


EM Fertilizer Bokashi

15 Pales Uling

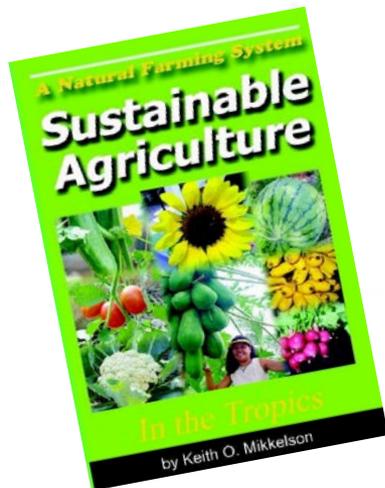
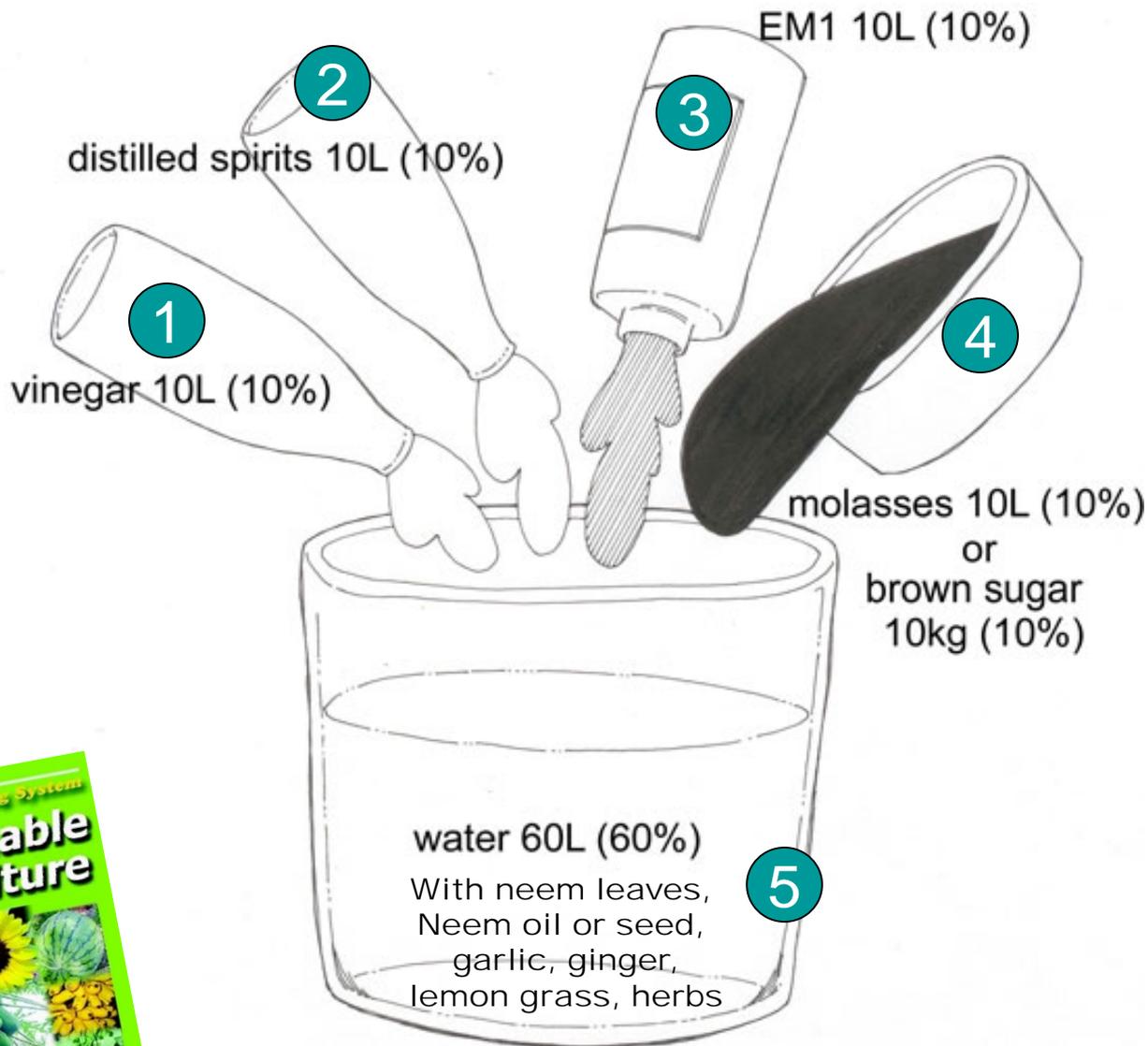
5 pales Manure
or Copra Meal





Stochu
(EM5)
keeps
pests away





How to make EM 5

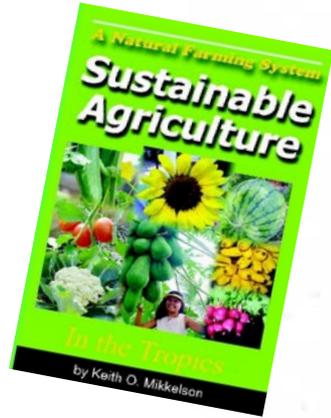
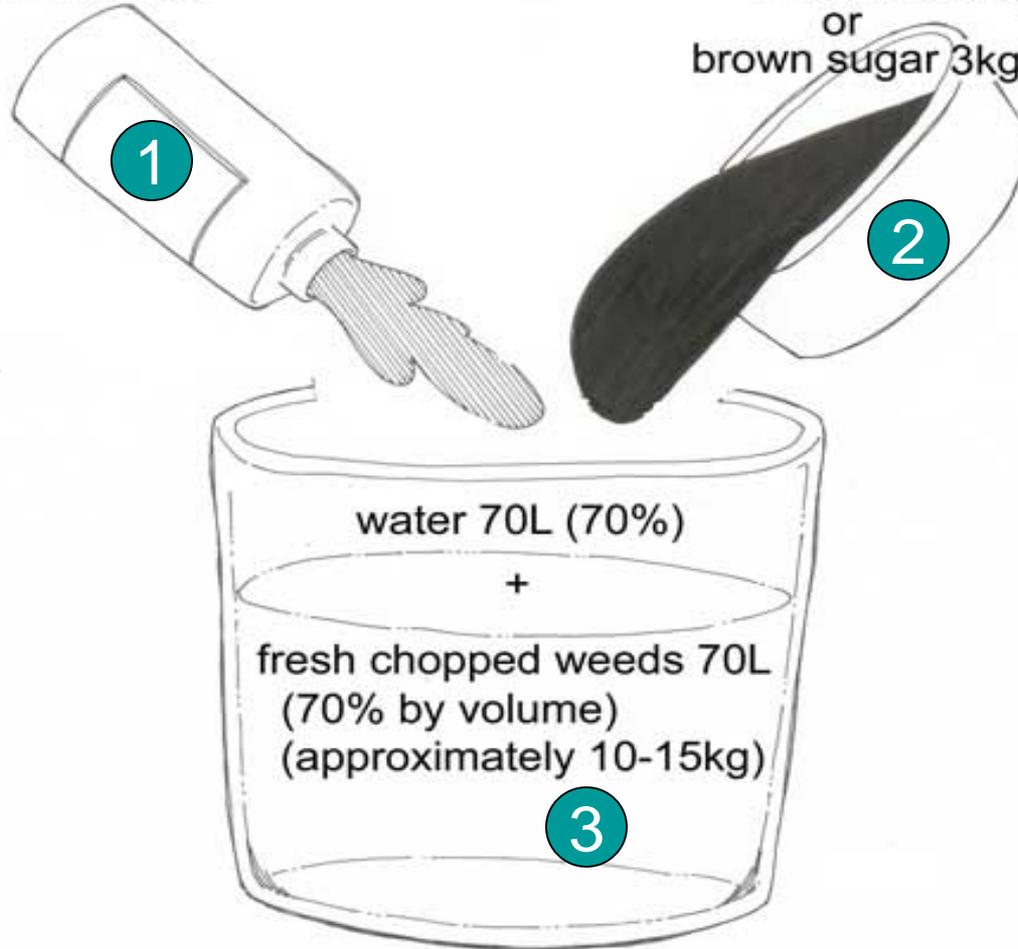
Insect repellent



EM Fermented Plant Extract (FPE)

EM1 3L (3%)

molasses 3L (3%)
or
brown sugar 3kg (3%)



P.G.R.

How to make FPE (100L)

Herbal Hormone Extract



Weeds having strong life and flavors and also
Neem, garlic, ginger, lemon grass, herbs, chili*
Grasses having medicinal values
Prunings, young shoots and immature fruits
(the weeds should be cut in the morning)

Microbial Herbal Hormone Infusion

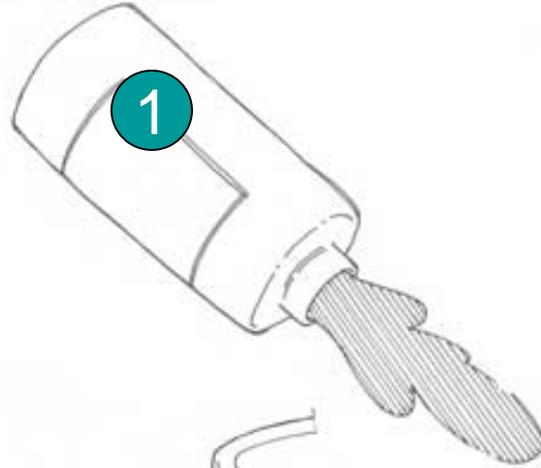
**Recommended chopped
plants**



EM Fermented Fruit Extract (FFE)

Ripening Agent

EM1 3L (3%)



molasses 3L (3%)
or
brown sugar 3kg (3%)



water 70L (70%)

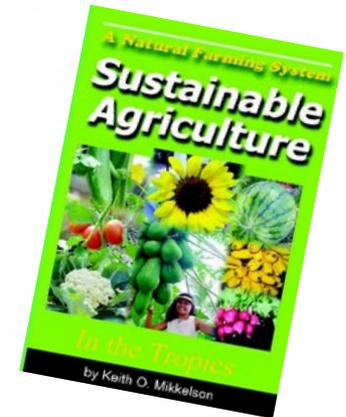
+

Ripe fruits

3

(70% by volume)
(approximately 10-15kg)

Brix Booster



How to make FFE (100L)

Korean Natural Farming

Microbial Inoculants



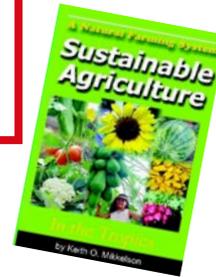
- Indigenous Micro organisms (IMO)
- Fermented Plant Juice (FPJ)
- Fermented Fruit Juice (FFJ)
- Lactic Acid Bacteria (LAB)

- Oriental Herbal Nutrients (OHN)

Herb Hormone

- Fermented Fish Amino Acid (FAA)
- Water soluble calcium (WCA)
- Water soluble calcium phosphate (WSCP)

Foliar Fertilizers



Korean Natural Farming

Microbial Inoculants

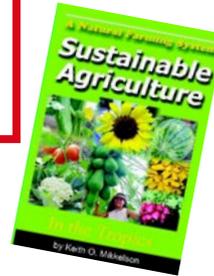


- Indigenous Micro organisms (IMO)
- Fermented Plant Juice (FPJ)
- Fermented Fruit Juice (FFJ)
- Lactic Acid Bacteria (LAB)
- Oriental Herbal Nutrients (OHN)

Herb Hormone

- Fermented Fish Amino Acid (FAA)
- Water soluble calcium (WCA)
- Water soluble calcium phosphate (WSCP)

Foliar Fertilizers



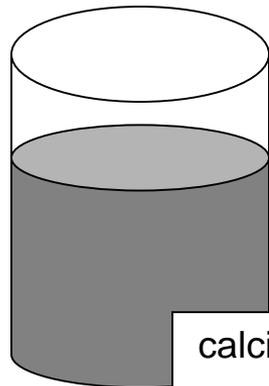
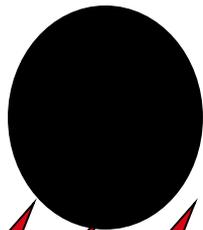
WSCP

Bones are high in Phosphate

Burnt Egg Shells + Natural Vinegar

WCA

Egg Shells are Calcium Carbonate



21 days

calcium carbonate → calcium oxide

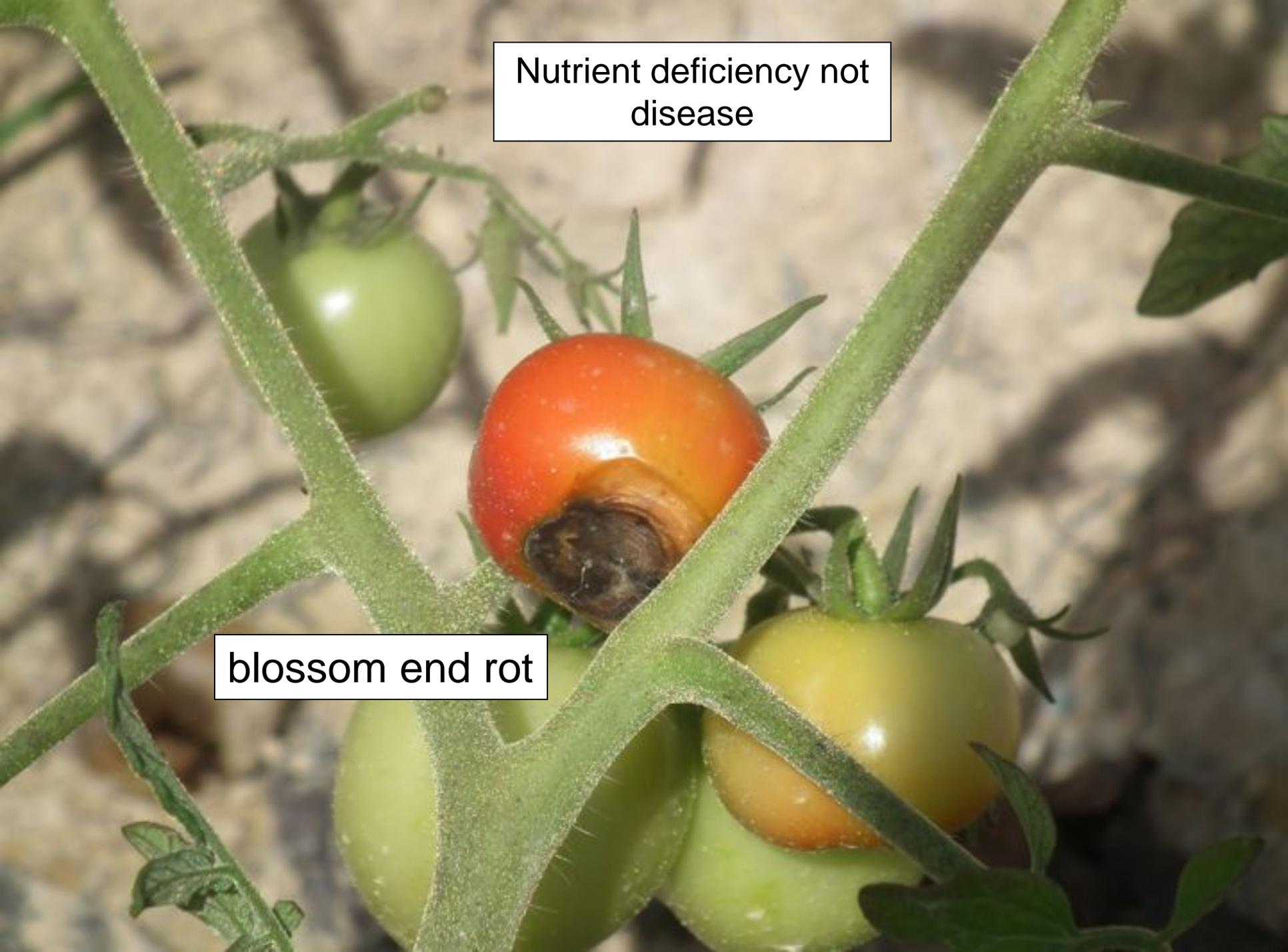
calcium is the "trucker" of all minerals



A photograph of a tomato field. The plants are supported by wooden stakes and are heavily laden with green tomatoes. Some tomatoes are beginning to turn yellow and orange, indicating they are ripening. The ground is sandy and light-colored. The overall scene is a healthy, productive tomato crop.

Tomato blossoms make tomatoes

Plant available calcium is required to form fruit

A close-up photograph of a tomato plant. The central focus is a single tomato that is mostly red but has a dark, sunken, and necrotic area at its blossom end. Several other tomatoes are visible: one green one in the upper left, and a cluster of yellow-green ones in the lower right. The stems are green and hairy. The background is a blurred, light-colored ground.

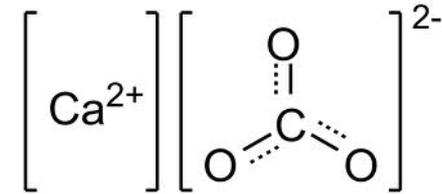
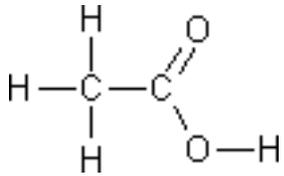
Nutrient deficiency not
disease

blossom end rot



Foliar Fertilizers

**Bones
Cow
Pig
Goat
Dinosaur
Free bones**



Eggshells are calcium carbonate (CaCO_3) and vinegar has acetic acid (CH_3COOH).



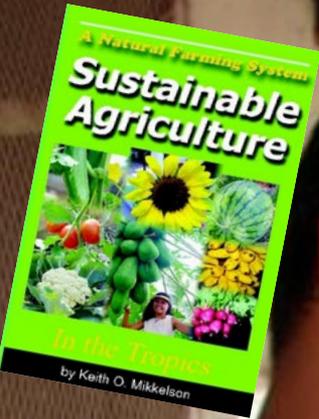
WSC

Calcium Carbonate (CaCO_3) and acetic acid (CH_3COO) react in a double replacement reaction, giving you calcium acetate, water, and carbon dioxide. Since calcium acetate is soluble it'll dissolve. This leaves behind the egg's inner membrane, making it flexible and rubbery.

Always
Be scientific!

**Fish
Silage**

Foliar Fertilizers





Alaska Native Knowledge Network

Fish Silage

Enzymes and peptides,
amino acids, available N

Lutefiske
Pickled Herring
Fish Sauce
Bagoong



Easily digested high energy food





Fish Silage
Fish Emulsion
F.A.A.
Fish Amino Acid

Fresh not rotten
Fish Waste
Entrails
Trash Fish
Free Fish

Foliar Fertilizers

Fish Silage (F.A.A.)

Enzymes and peptides,
amino acids, available N

Foliar Fertilizers

1 part chopped fish waste
1 part molasses
Small Water (if needed) to mix

Plastic Allowed for Fertilizer Production

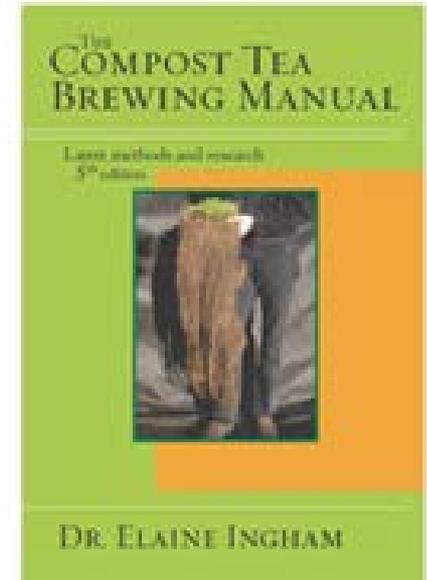
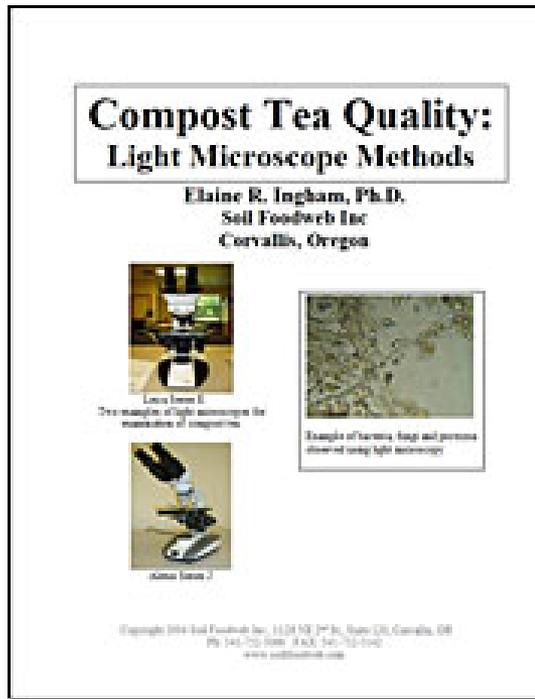
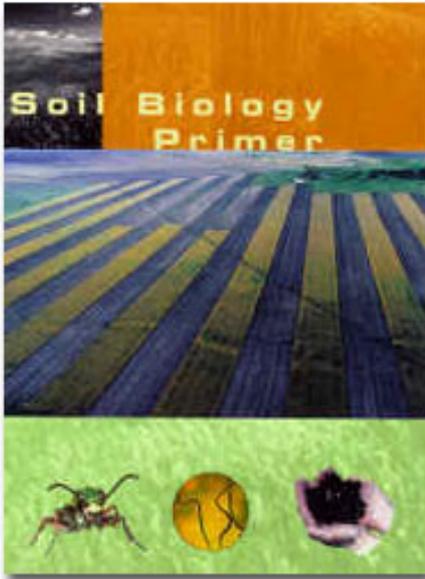
Aloha's Favorite Tea

**Organic
Foliar
Fertilizer**



Keith Mikkelson giving three (3) day intensive training for the Department of Agrarian Reform

USA: Dr. Elaine Ingram



- Dr. Ingram developed a curriculum for the Aerated Tea Brewers Guide
- The SOIL FOOD WEB is a complex inter relationship of organisms and chemical reactions that all effect each other.
- We can create favorable microbial habitats and inoculants for the soil food web to prosper



Aerated Vermicast Tea

Aloha's Favorite Tea

~~Fermentation~~

**Please:
Always Aerate
to culture Beneficial
Microorganisms**

Keith Mikkelson giving three (3) day intensive training for the Department of Agrarian Reform

1/2 Liter Molasses
1 L Vermicasts
20 L H₂O
E.M.

Air
Water
Compost
Molasses

Aquarium Air Pump



Brew 24 hrs for annual vegetables

Brew 48-72 hrs for Perennials

Harvest time



**This would
never happen
at Aloha House!**

**Some call this
"Compost Tea"**

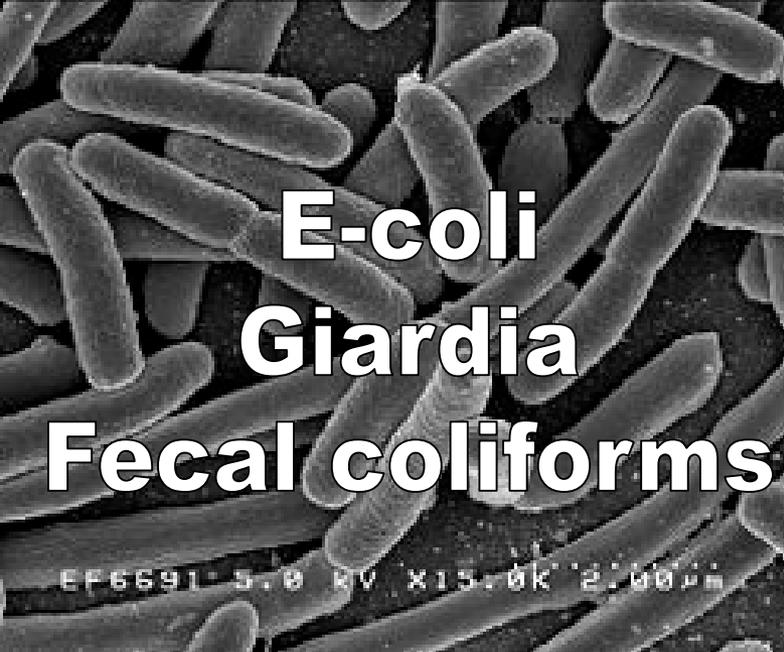
ORGANIC

Stagnant-Uncomposted-Raw-Manure

Organic?

Illegal in
the USA





E-coli
Giardia
Fecal coliforms

EP6691 5.0 kV X15.0K 2.00um

Enterohemorrhagic *E. coli* (EHEC): found in humans, cattle, and goats. Virotype is strain O157:H7, which causes bloody diarrhea without fever. EHEC can cause hemolytic-uremic syndrome and sudden kidney failure and possesses toxin that can elicit an intense inflammatory response.

The Giardia parasite lives in the intestine of infected humans or animals. Giardia is found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. You can become infected after accidentally swallowing the parasite;

Bad Microbes



If this is Organic
you should Panic

Always Aerate Compost Tea





6.5 gallon Home Brewing System

Compost Teas, Compost Extracts & Liquid Organic Extracts

Compost leachate is the dark-colored solution that leaches out of the bottom of the compost pile—most likely will be rich in soluble nutrients; but, in the early stage of composting it may also contain pathogens. It would be viewed as a pollution source if allowed to run off-site. Compost leachate needs further bioremediation and is not suitable or recommended as a foliar spray.

Compost Extract is made from compost suspended in a barrel of water for 7 to 14 days, usually soaking in a burlap sack—a centuries-old technique. The primary benefit of the extract will be a supply of soluble nutrients, which can be used as a liquid fertilizer. Anaerobic problems diminish results.

Compost tea, A.C.T. in modern terminology, is a compost extract brewed with a microbial food source—molasses, kelp, rock dust, humic-fulvic acids. The compost-tea brewing technique, an aerobic process, extracts and grows populations of beneficial microorganisms.

Compost teas are distinguished from compost extracts both in method of production and in the way they are used. Teas are actively brewed with microbial food and catalyst sources added to the solution, and a sump pump bubbles and aerates the solution, supplying plenty of much-needed oxygen. The aim of the brewing process is to extract beneficial microbes from the compost itself, followed by growing these populations of microbes during the 24- to 36-hour brew period. The compost provides the source of microbes, and the microbial food and catalyst amendments promote the growth and multiplication of microbes in the tea. Some examples of microbial food sources: molasses, kelp powder, and fish powder. Some examples of microbial catalysts: humic acid, yucca extract, and rock dust.

Building on the concept of compost teas as a liquid organic extract, what are some other common organic extracts used as a liquid drench or foliar spray?

Manure Tea - Manure-based extracts are a soluble nutrient source made from raw animal manure soaked in water. For all practical purposes, manure tea is prepared in the same way as the compost extracts described in the preceding section. The manure is placed in a burlap sack and suspended in a barrel of water for 7 to 14 days. The primary benefit of the tea will be a supply of soluble nutrients, which can be used as a liquid fertilizer.

Herbal Tea - Plant-based extracts are from stinging nettle, horse tail, comfrey, clover. A common method is to stuff a barrel about three-quarters full of fresh green plant material, then top off the barrel with tepid water. The tea is allowed to ferment at ambient temperatures for 3 to 10 days. The finished product is strained, then diluted in portions of 1:10 or 1:5 and used as a foliar spray or soil drench. Herbal teas provide a supply of soluble nutrients as well as bioactive plant compounds.

Liquid Manures - Mixtures of plant and animal byproducts steeped as an extract—stinging nettle, comfrey, seaweed, fish wastes, fish meal. Liquid manures are a blend of marine products (local fish wastes, seaweed extract, kelp meal) and locally harvested herbs, soaked and fermented at ambient temperatures for 3 to 10 days. Liquid manures are prepared similarly to herbal tea—the material is fully immersed in the barrel during the fermenting period, then strained and diluted and used as a foliar spray or soil drench. Liquid manures supply soluble nutrients and bioactive compounds.

Summary - Compost teas and herbal teas are tools that can be made on the farm to enhance crop fertility and to inoculate the phyllosphere and rhizosphere with soluble nutrients, beneficial microbes, and the beneficial metabolites of microbes.

Caution - Whereas raw animal manures are used as a compost windrow feedstock, the composting process—thermophillic heating to 135-160° F for 10-15 days—assures pathogen reduction. The raw organic matter initially present in the compost windrow undergoes a complete transformation, with humus as an end product. Any pathogens associated with raw manures will be gone. So caution is extended: Manure teas are NOT the same thing as compost teas or compost extracts. Because of concerns over new pathogenic strains of E. coli, the author advises growers to reconsider manure teas and/or to work with a microbial lab to ensure a safe, worthwhile product.

Steve Diver ATTRA

Methods of Compost Tea Production

Bucket-Fermentation Method

"Passive" compost tea is prepared by immersing a burlap sack filled with compost into a bucket or tank, stirring occasionally. Usually the brew time is longer, from 7 to 10 days. This is the method that dates back hundreds of years in Europe, and is more akin to a compost watery extract than a "brewed" and aerated compost tea.

Bucket-Bubbler Method

The equipment setup and scale of production are similar to the bucket method, except that an aquarium-size pump and air bubbler are used in association with microbial food and catalyst sources added to the solution as an amendment. Since aeration is critical, as many as three sump pumps may be used in a bucket simultaneously.

With homemade compost tea brewing, a compost "sock" is commonly used as a filter-strainer. Ideally, the mesh size will strain compost particulate matter but still allow beneficial microbes—including fungal hyphae and nematodes—to migrate into solution. Single-strand mesh materials such as nylon stockings, laundry bags, and paint bags are some of the materials being used; fungal hyphae tend to get caught in polywoven fabrics. If burlap is used, it should be "aged" burlap.

Trough Method

Large-scale production of compost teas employs homemade tanks and pumps. An 8- or 12-inch-diameter PVC pipe is cut in half, drilled full of holes, and lined with burlap. Compost is placed in this makeshift trough. The PVC trough is supported above the tank, several feet in the air. The tank is filled with water, and microbial food sources are added as an amendment. A sump pump sucks the solution from the bottom of the tank and distributes the solution to a trickle line running horizontally along the top of the PVC trough filled with compost. As the solution runs through the burlap bags containing the compost, a leachate is created which then drops several feet through the air back into the open tank below. A sump pump in the bottom of the tank collects this "tea" and distributes it back through the water line at the top of the trough, and so on. Through this process, which lasts about seven days, the compost tea is recirculated, bubbled, and aerated. The purpose of the microbial food source is to grow a large population of beneficial microorganisms.

Commercial Tea Brewers

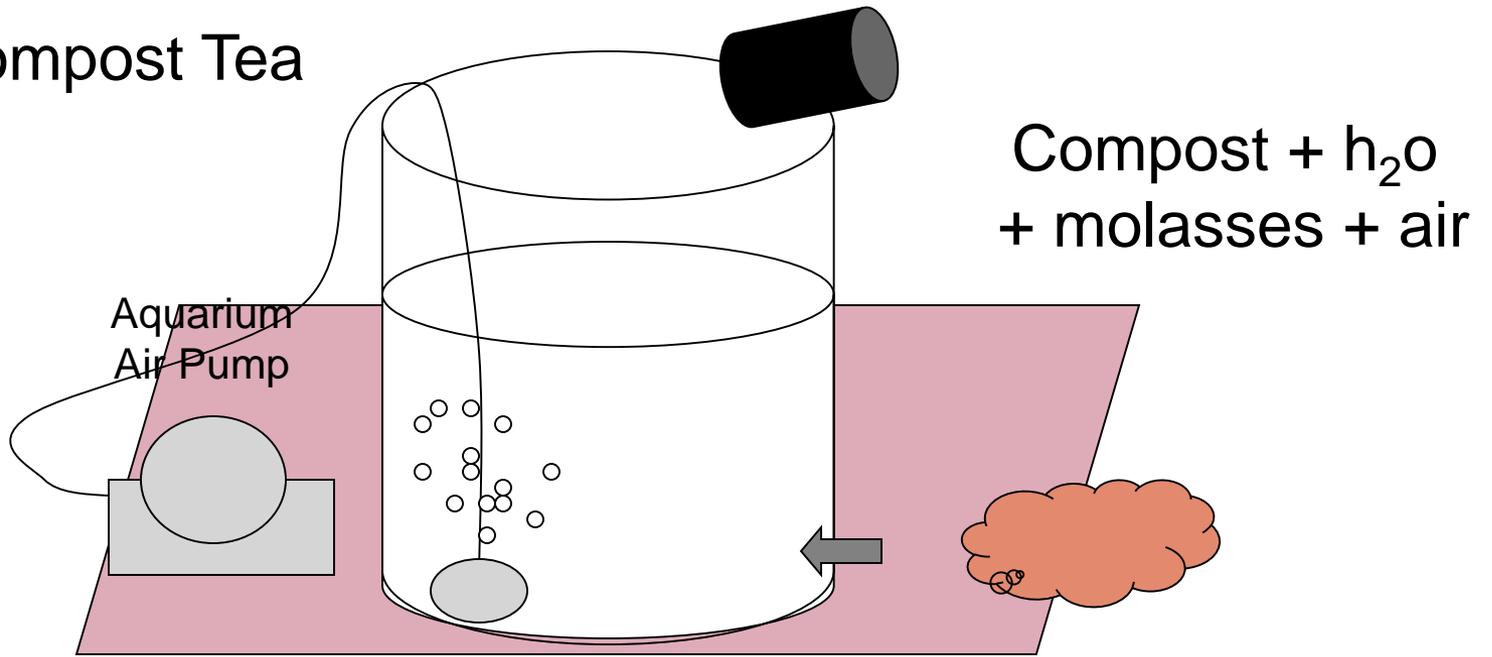
Commercial equipment is available for the production of brewed compost teas (see a list of suppliers below). Usually there is a compost sack or a compost leachate basket with drainage holes, either of which are used to hold a certain volume of compost. The compost-filled container is placed in a specially designed tank filled with chlorine-free water. Microbial food sources are added to the solution. A pump supplies oxygen to a specially-designed aeration device which bubbles and aerates the tea. **Steve Diver ATTRA**

Vortex Method

The use of air to raise water and then draw down into a vortex the fluid tea. Highly aerobic and energized by the organized water flow, the fluid then passes through a chaos chamber before it once again is organized by the vortex. This method is popular among EM users as well as biodynamic systems.

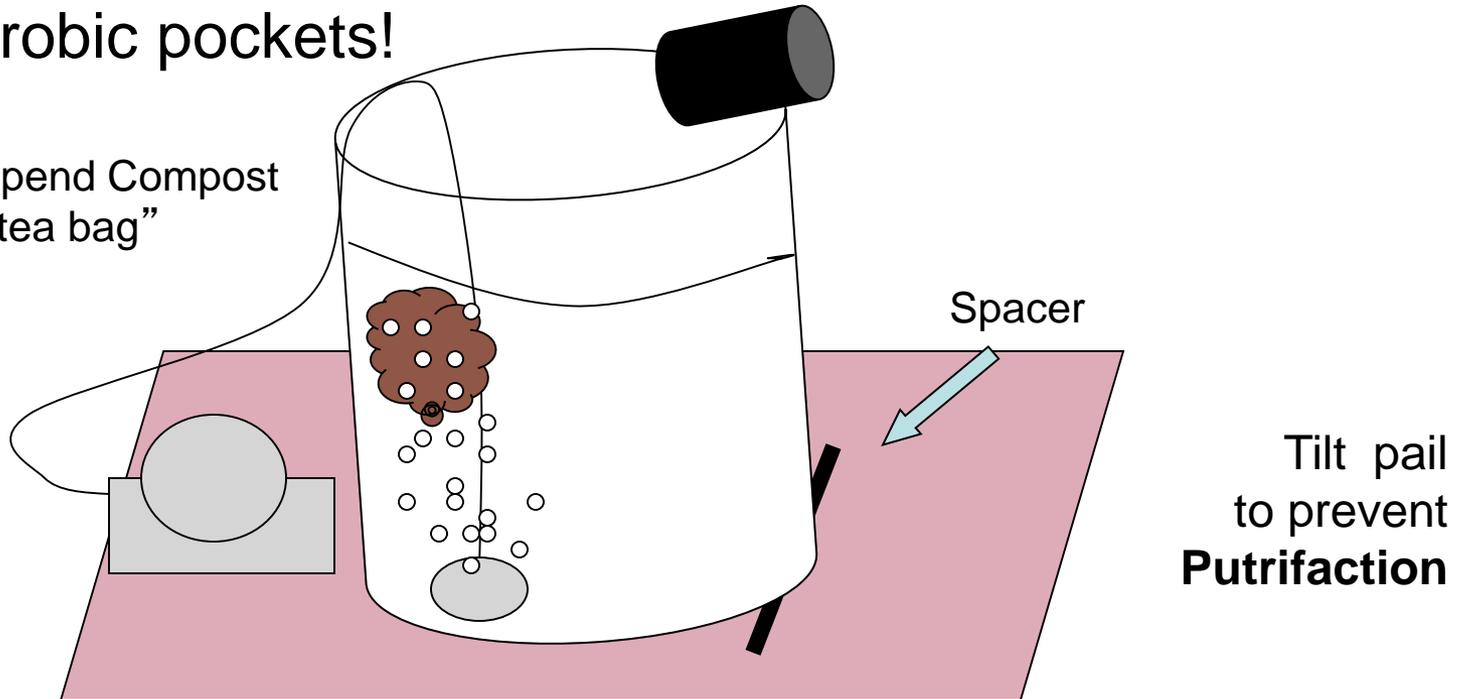
Basic Compost Tea

Air Stone



Avoid anaerobic pockets!

Suspend Compost
In "tea bag"

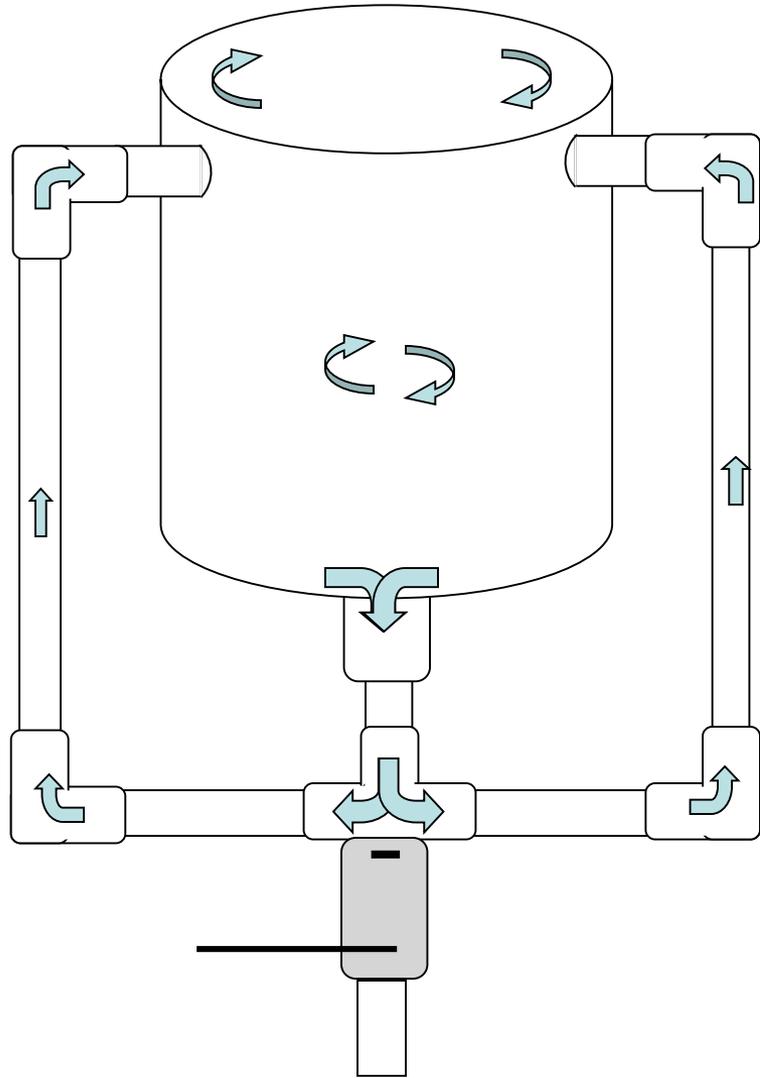




Vortex Brewer



Single Vortex Brewer







Clockwise



Counter Clockwise



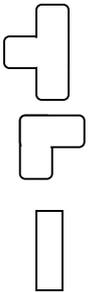
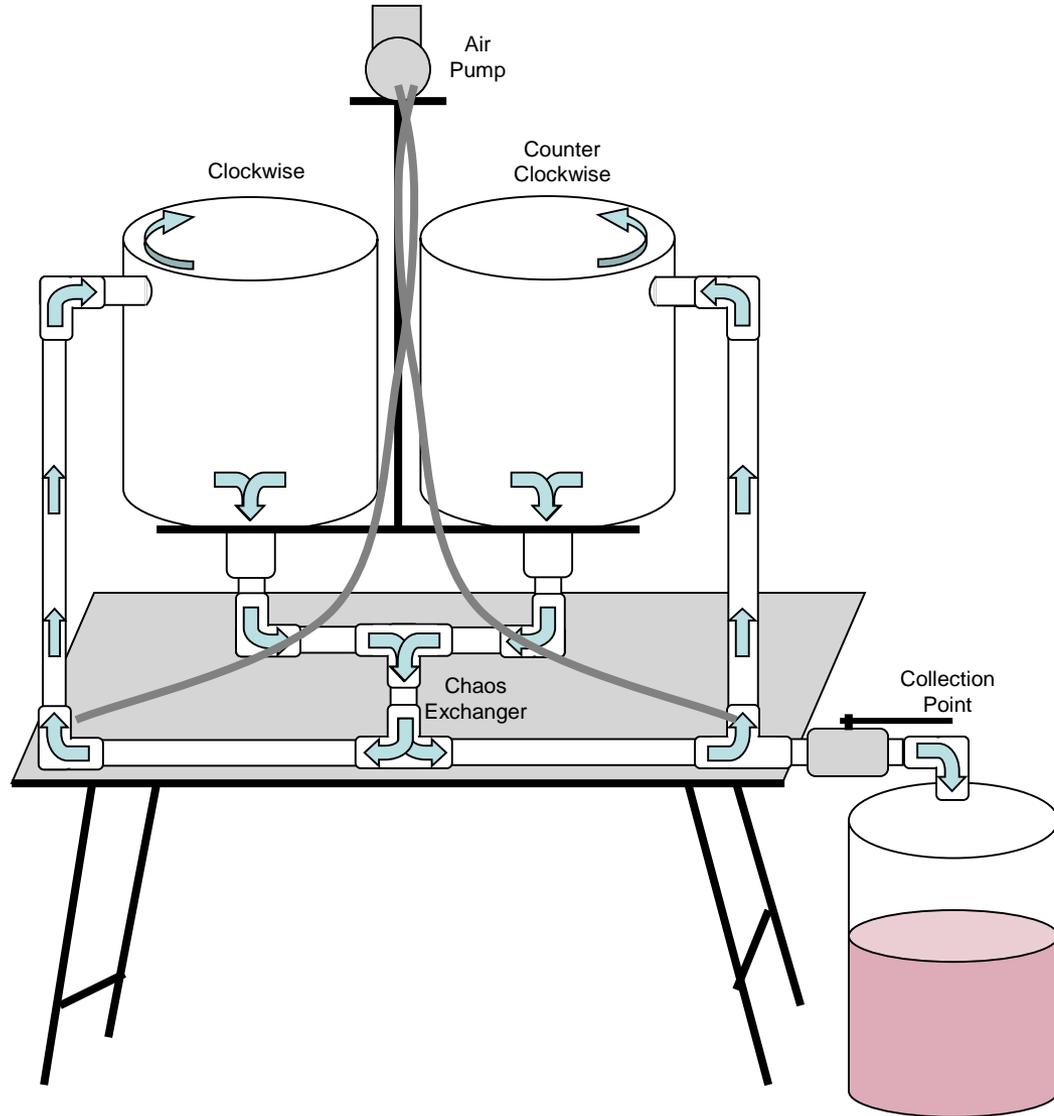
Clockwise / counter clockwise





**Mixing Chamber
(Chaos Chamber)**

Whizz-bang Double Vortex Compost Tea Brewer



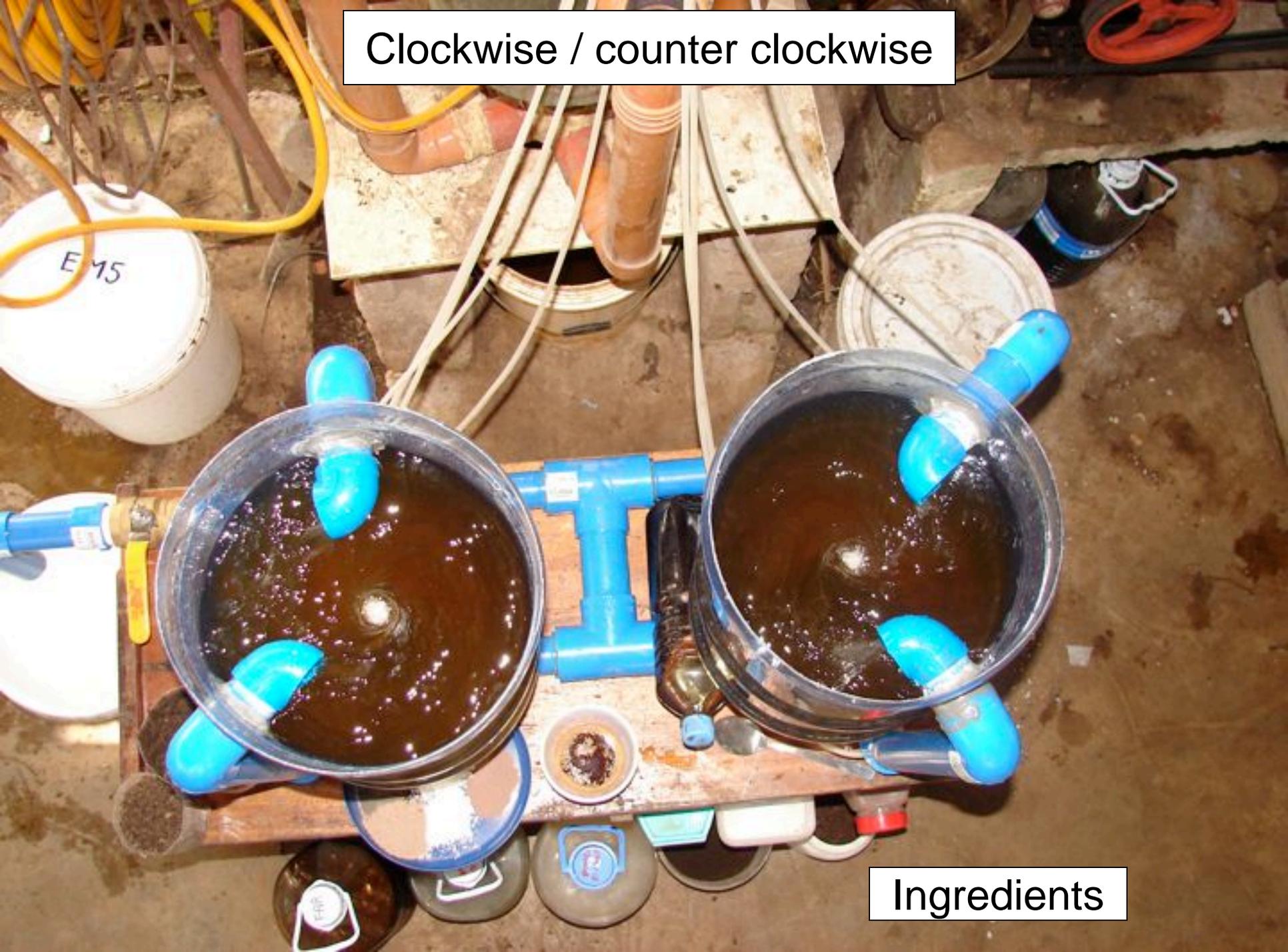
Clockwise / counter clockwise





Ingredients

Clockwise / counter clockwise



Ingredients

Ingredients



Rock Powders



Epsom Salt

Rock Powder

Rock Powder

Sea Salt

Granite Dust

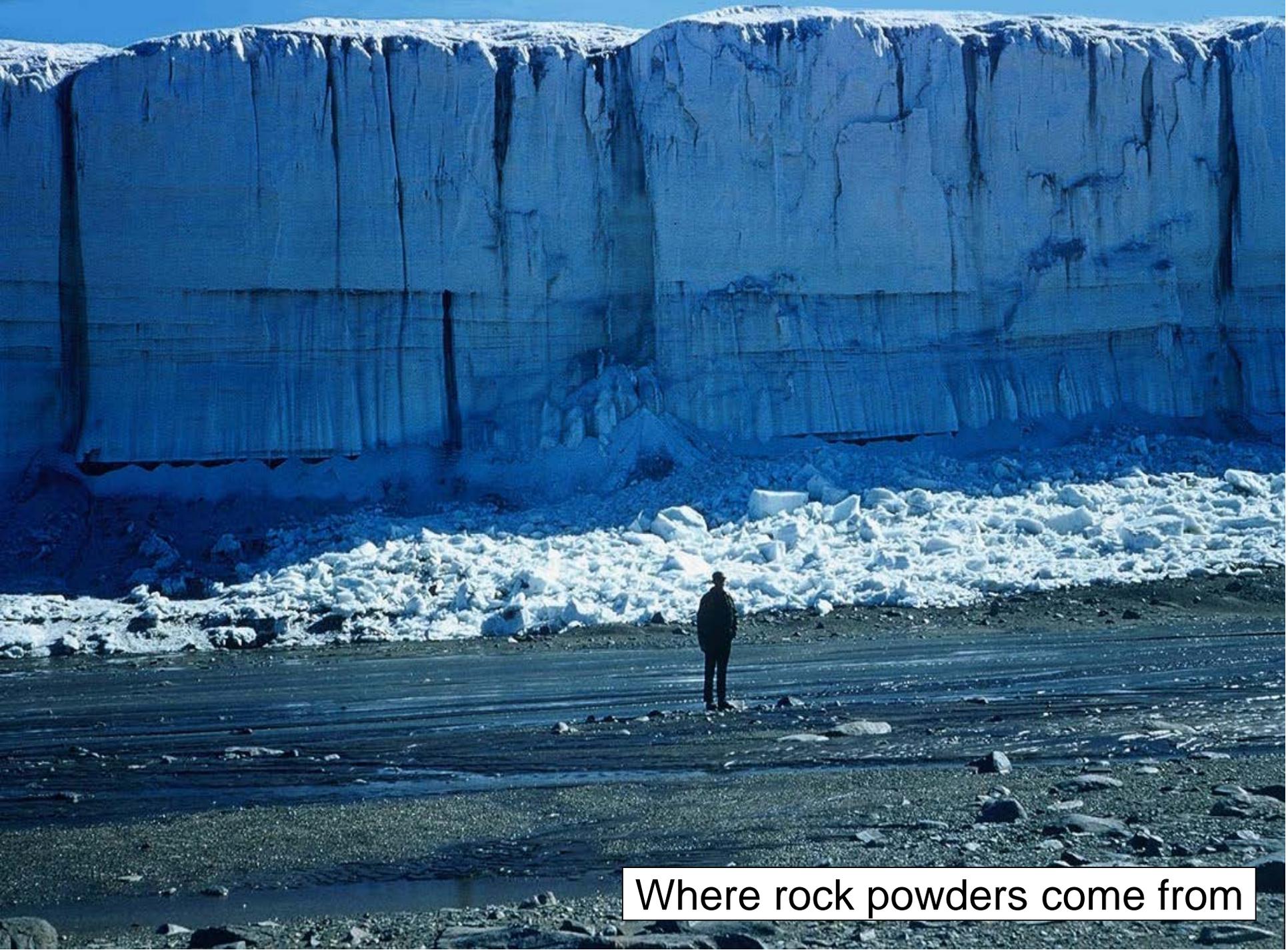
Bat Guano

Calcium Carbonate

EM5

MIST DONUT

Ingredients



Where rock powders come from



Where rock powders come from



Where rock powders come from



Charcoal blends with rockdust

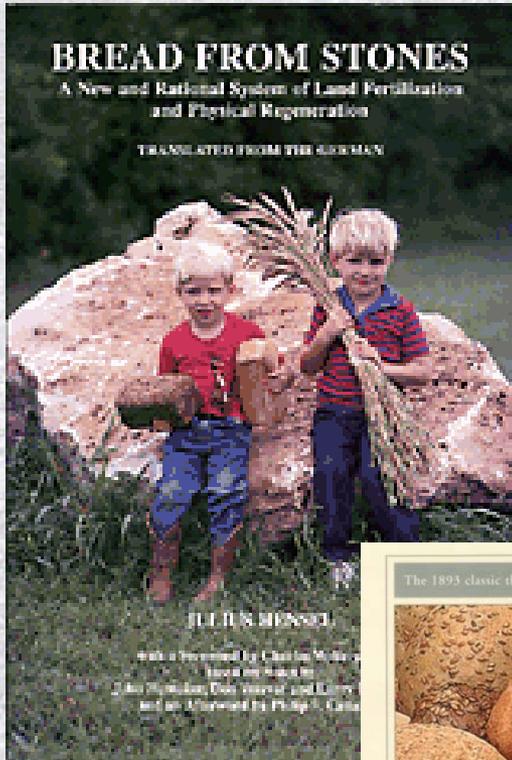
AVERAGE IGNEOUS ROCKS, AFRICA AND ASIA

	1	2	3	4	5	6	7	8
SiO ₂	58.21	54.67	50.59	56.02	61.92	61.81	59.72	SiO ₂
Al ₂ O ₃	15.28	16.21	15.81	15.68	15.49	15.73	16.51	Al ₂ O ₃
Fe ₂ O ₃	3.52	3.02	4.44	3.48	3.17	2.07	3.18	Fe ₂ O ₃
FeO	3.73	4.93	5.79	4.41	2.75	4.41	2.95	FeO
MgO	3.51	4.21	5.79	4.04	2.63	2.47	3.03	MgO
CaO	5.09	6.51	7.36	5.87	4.50	5.16	5.76	CaO
Na ₂ O	4.83	4.36	4.27	4.60	4.10	3.11	3.78	Na ₂ O
K ₂ O	3.28	3.05	2.31	3.07	3.23	2.51	3.05	K ₂ O
H ₂ O ⁺	1.26	1.13	1.47	1.25	1.23	1.48	1.11	H ₂ O ⁺
TiO ₂	0.84	1.44	1.63	1.14	0.68	0.76	0.50	TiO ₂
P ₂ O ₅	0.20	0.35	0.43	0.27	0.12	0.27	0.18	P ₂ O ₅
MnO	0.07	0.01	0.04	0.05	0.10	0.17	0.14	MnO
BaO	BaO
Incl.	0.18	0.11	0.07	0.12	0.08	0.03	0.09	Incl.
	<u>100.00</u>							

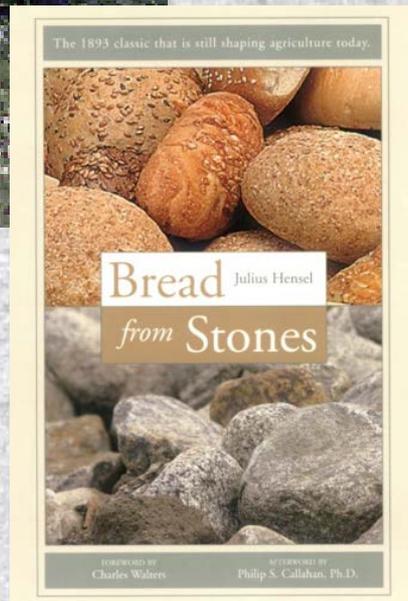
1. Africa, continental. 223 analyses.
2. Madagascar, including Reunion. 140 analyses.
3. South Atlantic Islands (Azores, Canaries, Madeira, Cape Verde, Ascension, St. Helena). 56 analyses.
4. Africa and islands, including Madagascar and Atlantic Islands. 419 analyses.

5. Asia, continental. 114 analyses.
6. Japan. 69 analyses.
7. Malaysia, including Philippines. 129 analyses.
8. Asia, including continent, Malaysia and Japan. 312 analyses.

Dr. Julius Hensel (1894)



- This book was the first work to attack Von Liebig's salt fertilizer thesis.
- Translated from the German, the book introduced people to the idea that plants require healthy food in order to flourish, just as a human being does.
- It describes a then new and rational system for fertilization which has become science today — fertilizing with stone dust.
- Hensel went searching for food for plants and found it in the rocks. Fed on such foods, plants will yield healthy, wholesome and life sustaining food that escapes disease and parasites.





Where rock powders come from



Gravel dust



Gravel

Where rock powders come from



Quartz

Where rock powders come from

Testing benefits



Plant Sap
Disease free at 12⁰+

Got Minerals?



Ingredients for compost tea



Bone Calcium
Phosphate Extract



Egg Calcium Extract



Vermi Casts



Bio D 500

FAA

Humic Substances

Terminology of Humus-related Materials

Humus--product resulting from decay of organic matter. Contains both humic and non-humic material.

Humin--the alkali-insoluble fraction of leonardite. (The usage of this term does not correspond exactly with the usage by other workers.) .

Humic substances--(plural) the collective name for the acid radicals found in humic matter. Typically separated from humic matter by alkaline extraction.

Humic acid--(singular) the acid radical found in humic matter which is soluble in alkali but insoluble in acid, methyl ethyl ketone, and methyl alcohol.

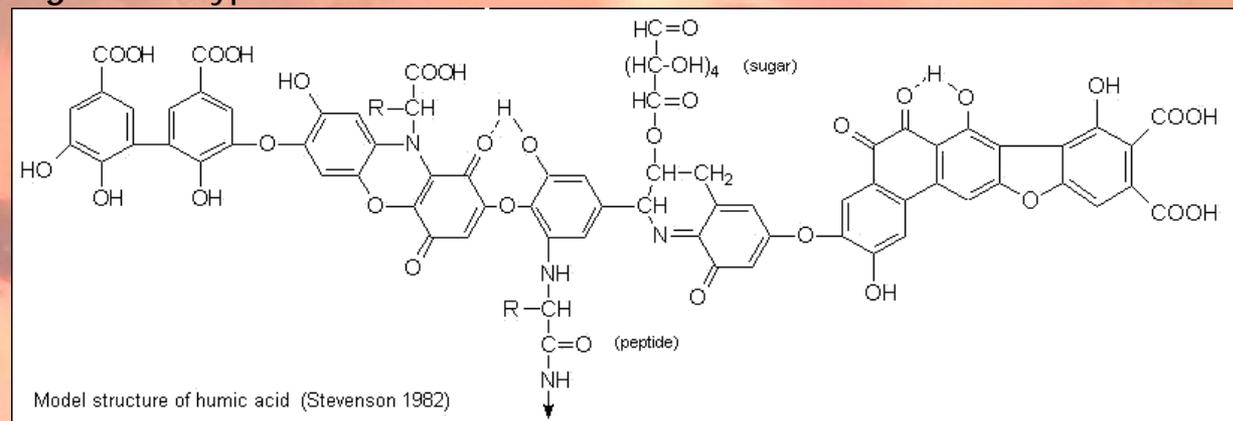
Humate--the salts of humic acids, collectively, or the salts of humic acid specifically. (The usage must be determined from the context.)

Fulvic acid--the acid radical found in humic matter which is soluble in alkali, acid, methyl ethyl ketone, and methyl alcohol.

Fulvates--the salts of fulvic acid.

Leonardite--a soft brown coal-like deposit usually found in conjunction with deposits of lignite.

Lignite--a type of soft coal.



Water Additive

Fish appetite stimulant

Anti viral properties

Increases microbial activity

Stabilizes soil nutrients



Got Tea?

Home composting

STEP-BY-STEP GUIDE
TO TAKAKURA COMPOSTING

In the Takakura composting method, organic waste is broken down by micro-organisms that are cultivated from local materials. The method involves making a seed compost from fermented solutions and a fermenting bed. Organic waste is mixed with the seed compost and left to degrade in a ventilated container or basket.

1. Making a fermenting solution

A. Sugar fermentation solution



Mix everything in an airtight container and leave for three to five days for fermentative micro-organisms to grow.

Other fermented food can be used in place of tempe, such as yoghurt, tapai, miso paste or tauchiang.

B. Salt fermentation solution



Mix everything in an airtight container and leave for three to five days for fermentative micro-organisms to grow.

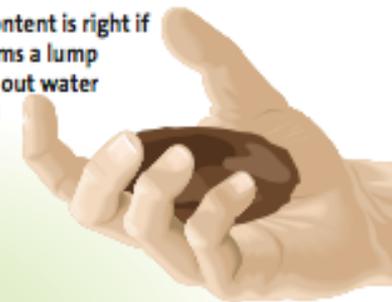
The fermenting solutions are ready when a layer of mould forms on top. The mixture should smell sweet-sour and of alcohol. If it smells strange or bad, discard and do again.

2. Making the seed compost

Mix equal amounts of rice bran and rice husk to form a fermenting bed. Stir in sugar and salt fermenting solutions bit by bit, adjusting the moisture level to 40% to 60%.



The moisture content is right if the mixture forms a lump without oozing out water when squeezed in the hand.



Store mixture in a covered carton box for three to five days. The box should feel warm. When the content is covered with white mould, the fermentation is complete. Let mixture dry out. The seed compost is ready for use.

3. Making a compost container

4. Composting

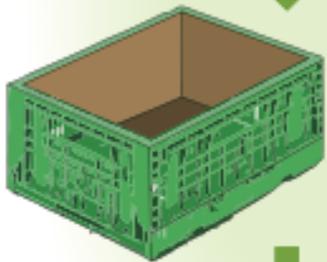
Takakura Composting

Heat costs fertilizer power

3. Making a compost container



A container of 60-litre capacity is suitable. It should have holes at the sides to allow air ventilation. Suitable containers: plastic crates, laundry baskets or storage boxes; or wicker laundry baskets.



Line the inside of the container with thick paper carton or carpet to prevent spillage of compost and insect infestations.

Fill the container to 60% capacity with seed compost. Leftover seed compost can be kept for future use.



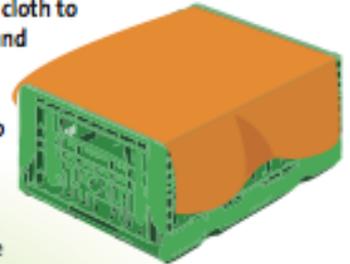
4. Composting

Cut up your kitchen scraps. This will speed up fermentation. Drain excess liquid from chopped waste, then stir into container of seed compost.



Maintain the moisture content of the seed compost at 40%-60%. High moisture content will inhibit fermentation, resulting in offensive odours. If mixture is too wet (this can happen with large amounts of vegetable scraps), add orange, onion or garlic peel or bits of paper.

Cover container with cloth to keep mixture warm and protected from insects. Stir the mixture once a day to intensify fermentation and inhibit the growth of putrefying micro-organisms. The chopped waste should lose their shape in 1-2 days. Repeat the process until the container is full.



If steam rises while the content is being stirred, it indicates that the fermentation is progressing well, with the temperature reaching 40°-50°C. Fermentation slows down if the temperature is low. To raise the temperature: place the container inside a cardboard box or polystyrene container with holes; or put a plastic bottle of hot water in the container.



When the container is full, transfer the content into a cardboard box or sack, leaving behind an ample amount as seed compost for your next round of composting. Store the removed compost for two weeks to allow it to mature.

Using semi-mature compost (which has not fully decomposed) can damage plant roots because the fermentative micro-organisms are still active and will emit gas and organic acids.

Heat

- > Spread the compost on the field, and plough it to a depth of about 20cm.
- > Spread compost over soil, after planting crops.
- > Bury compost to a depth of 20cm around a tree.



5. Using compost

Compost gradually releases nutrients into the soil, thereby improving the soil environment.



Takakura Composting

Heat costs fertilizer power



Transfer the seed compost from the box to the compost container. The compost container should be two-thirds full. During the transfer, you can see steam coming out of the seed compost.

Home composting

STEP-BY-STEP GUIDE TO TAKAKURA COMPOSTING

In the Takakura composting method, organic waste is broken down by micro-organisms that are cultivated from local materials. The method involves making a seed compost from fermented solutions and a fermenting bed. Organic waste is mixed with the seed compost and left to degrade in a ventilated container or basket.

1. Making a fermenting solution

A. Sugar fermentation solution

Mix everything in an airtight container and leave for three to five days for fermentative micro-organisms to grow.

3litres water
200g jaggery (gula merah)
Tempe, one piece, cubed

Other fermented food can be used in place of tempe, such as yoghurt, tapai, miso paste or taucheong.

B. Salt fermentation solution

Mix everything in an airtight container and leave for three to five days for fermentative micro-organisms to grow.

3litres water
1 heaped tablespoon salt
Mixture of vegetable scraps and fruit peel

The fermenting solutions are ready when a layer of mould forms on top. The mixture should smell sweet-sour and of alcohol. If it smells strange or bad, discard and do again.

2. Making the seed compost

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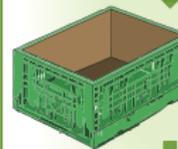
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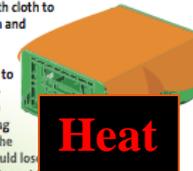


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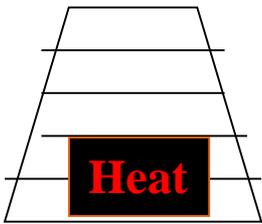
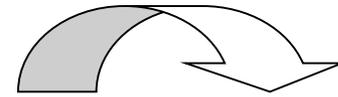
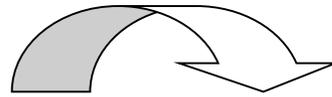
Compost Piles

Thermophylic Bacteria

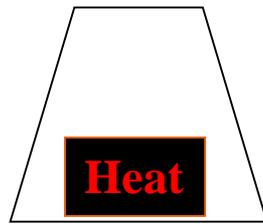
Mesophylic Bacteria

Actinomycetes

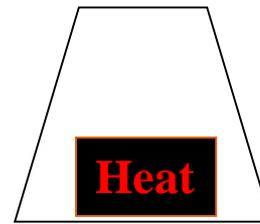
Fungi



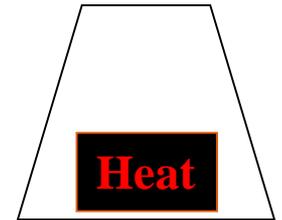
Initial
Layering



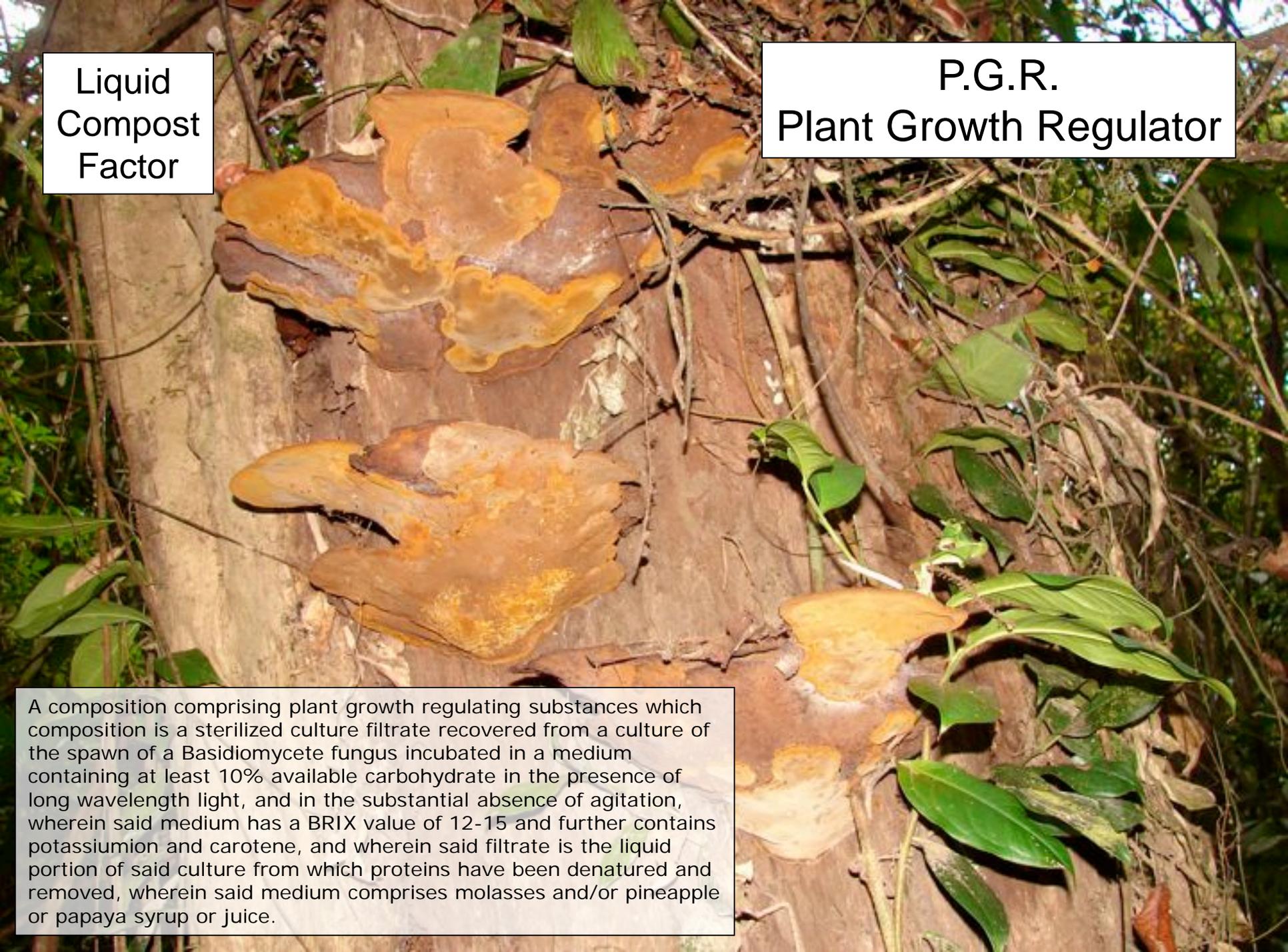
1st Turn
Five to
seven days



2nd Turn
Five to
seven days



3rd Turn
Let mature
for up to 6
months



Liquid
Compost
Factor

P.G.R.
Plant Growth Regulator

A composition comprising plant growth regulating substances which composition is a sterilized culture filtrate recovered from a culture of the spawn of a Basidiomycete fungus incubated in a medium containing at least 10% available carbohydrate in the presence of long wavelength light, and in the substantial absence of agitation, wherein said medium has a BRIX value of 12-15 and further contains potassiumion and carotene, and wherein said filtrate is the liquid portion of said culture from which proteins have been denatured and removed, wherein said medium comprises molasses and/or pineapple or papaya syrup or juice.



Seaweed Extracts

Seaweed extracts contain natural plant growth regulators (PGR) which control the growth and structural development of plants. The major plant growth regulator are **auxins, cytokinins, indoles and hormones**.

These PGRs seaweed are in very small quantities generally measured in parts per million. It only takes a very small amount of these to do the job.

Indole compounds help the development of plant roots and buds.

Cytokinins are hormones that promote growth via rapidly speeding up the process of cell division making seaweed extract of value in treating tissue cultures. When they are applied to foliage the leaves rejuvenate stimulating photosynthesis. Thus they stay green longer. The cytokinins in seaweed extract are a major factor when applied to apple and peach trees in promoting the growth of fruiting spurs and reduce premature dropping of fruit. Auxins, also hormones, occur in the roots and stems during cell division. They move to areas of cell elongation where they allow the walls of cells to stretch. Auxins actually give fruits and vegetables a naturally longer shelf life. This is known as delaying senescence: the deterioration of cells and tissues that results in rotting.

P.G.R.
Plant Growth Regulator

1924 Biodynamics

- In Germany, [Rudolf Steiner](#) developed [biodynamic agriculture](#), the first comprehensive organic farming system.
- This began with a lecture series Steiner presented at a farm in Koberwitz (now in Poland) in 1924.
- Steiner emphasized the farmer's role in guiding and balancing the interaction of the animals, plants and soil. Healthy animals depended upon healthy plants (for their food), healthy plants upon healthy soil, healthy soil upon healthy animals (for the manure).



Biodynamic Preparations

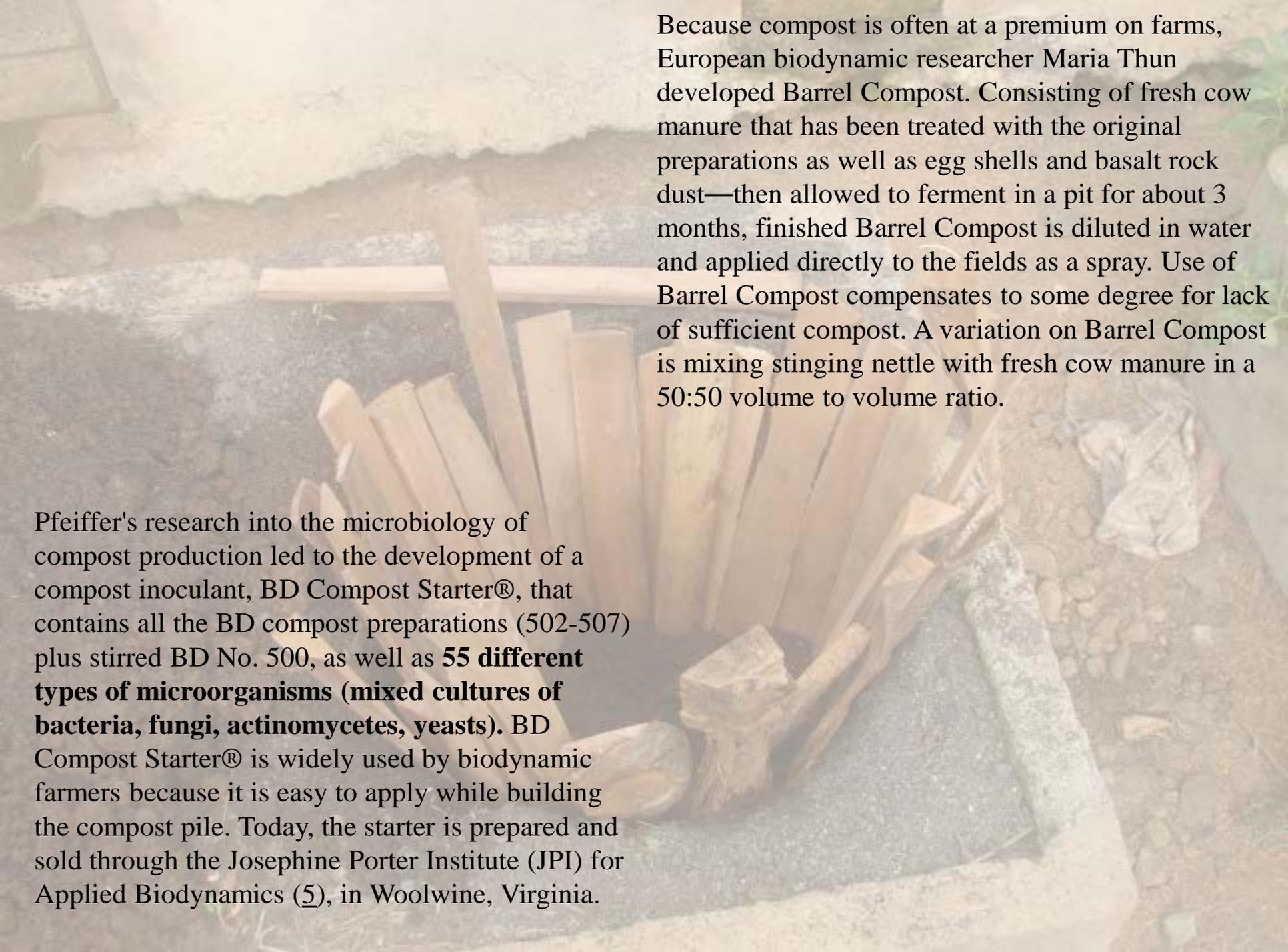
BD 500

BD 501



Biodynamic Composts





Because compost is often at a premium on farms, European biodynamic researcher Maria Thun developed Barrel Compost. Consisting of fresh cow manure that has been treated with the original preparations as well as egg shells and basalt rock dust—then allowed to ferment in a pit for about 3 months, finished Barrel Compost is diluted in water and applied directly to the fields as a spray. Use of Barrel Compost compensates to some degree for lack of sufficient compost. A variation on Barrel Compost is mixing stinging nettle with fresh cow manure in a 50:50 volume to volume ratio.

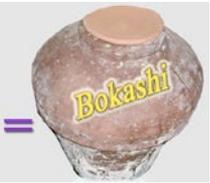
Pfeiffer's research into the microbiology of compost production led to the development of a compost inoculant, BD Compost Starter®, that contains all the BD compost preparations (502-507) plus stirred BD No. 500, as well as **55 different types of microorganisms (mixed cultures of bacteria, fungi, actinomycetes, yeasts)**. BD Compost Starter® is widely used by biodynamic farmers because it is easy to apply while building the compost pile. Today, the starter is prepared and sold through the Josephine Porter Institute (JPI) for Applied Biodynamics ([5](#)), in Woolwine, Virginia.



Aerobic Compost

Simulate Nature

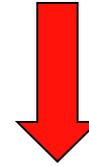
Thermophilic / Mesophiles / Actinomycetes / Fungi



Ancient Forest Bokashi



KNF



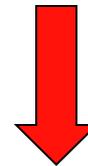
EM1

My order of
experience



ACT

Aerated Compost Teas



Biodynamic Preps

Simulate Nature



EM1



Ancient Forest Bokashi

Lower Tech



Aerobic Compost

Thermophilic / Mesophiles / Actinomycetes / Fungi

Complexity



KNF



ACT

Aerated Compost Teas

Higher Tech



Biodynamic Preps



Aerobic Compost

Simulate Nature

Thermophilic / Mesophiles / Actinomycetes / Fungi

EM1

Low



Ancient Forest Bokashi

ACT

Aerated Compost Teas

Cost



Biodynamic Preps



High

KNF
IMO
LAS
FPJ
FFJ
FAA



KNF



Ancient Forest Bokashi

Simulate Nature

Long time

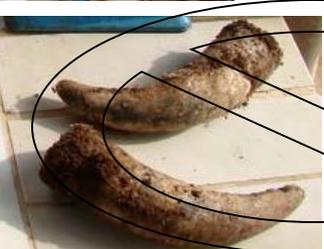
EM1



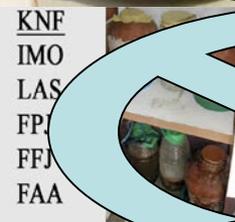
ACT

Aerated Compost Teas

Adaption/longevity



Biodynamic Preps



KNF

KNF Palawan Trained - 1,200

After 1 year - <10

Short time

~~Aerobic Compost~~

~~Thermophilic / Mesophiles / Actinomycetes / Fungi~~



Cost
Lower Tech

Adaption/longevity

**Your order of
experience**

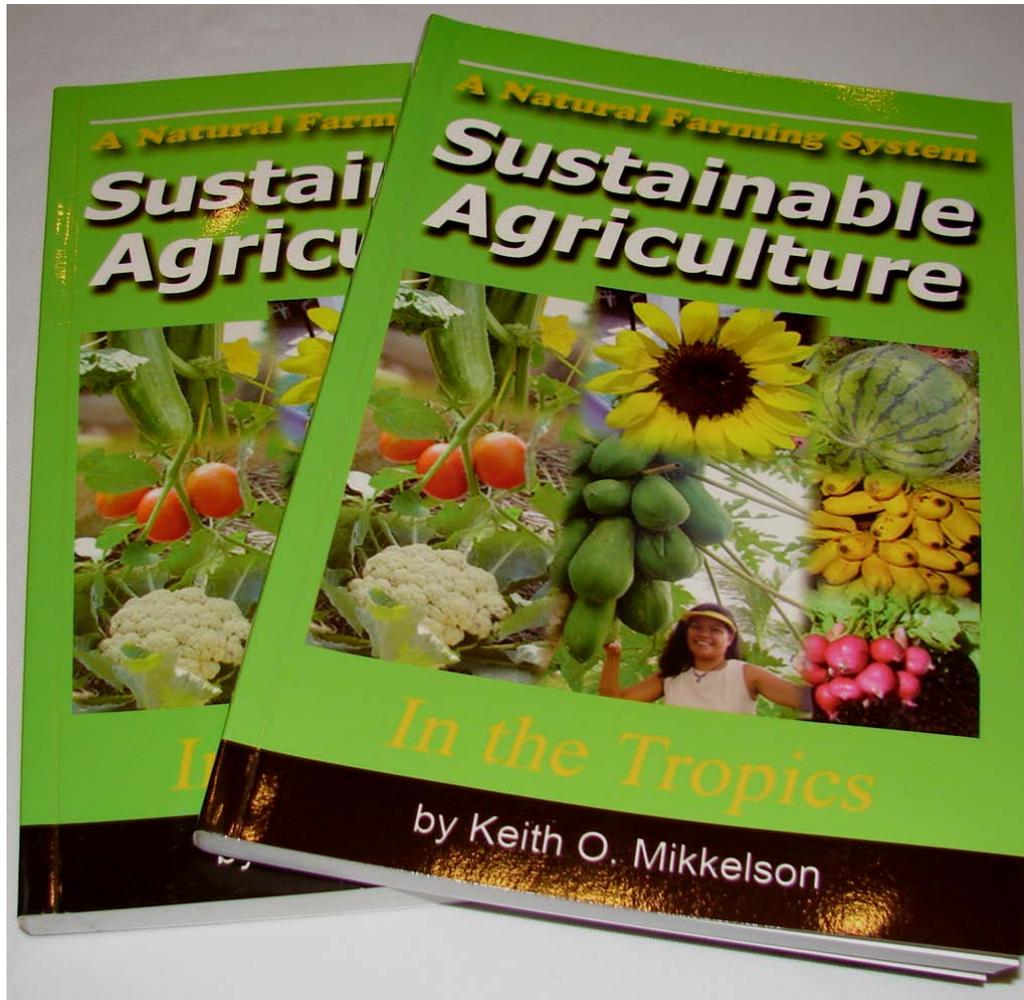
Just Do It!

3 Day Intensive Training



- **Arrive Monday**
- **T-W-Th Training: lectures and hands**
- **Friday - Underground River or farm tours**
- **Check out Saturday**

RESOURCE RECOVERY FOR THE PRODUCTION OF HIGH QUALITY NUTRIENT DENSE FOOD FOR MAXIMUM HEALTH



**A Natural Farming Method for
Sustainable Agriculture
in the Tropics**

By Keith O. Mikkelson

mik@mozcom.com

Sustainable Agriculture



Korean Natural Farming
Kyusei Nature Farming
Demeter Biodynamics
F.A.I.T.H. Gardening
French Raised Beds
Farming God's Way
Keyline Design
SALT Farming
Permaculture
Sustainable
Square foot

- Natural Farming
- Nature Farming
- Permaculture
- Organic Farming
- Bio-Dynamic Farming
- Biological Farming

Quality Assurance

- USDA Certification - N.O.P.
- OMRI
- Philippine Certification
- Only guarantees a minimum
- Pesticide free. Chemical free. Three years prior to production.
- No pesticide residue testing. None in food.
- Minimum standard - poison free
- No nutritional standard. No testing, claims only.
- Organic by Default - Most organic food





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- [Fair Trading Regulations](#)
- [Industry Marketing and Promotion](#)

You are here: [Home](#) / [National Organic Program](#) / [USDA Accredited Certifying Agents](#)

National Organic Program

USDA Accredited Certifying Agents

Number of domestic accredited certifying agents: 55
Number of foreign accredited certifying agents: 40
Total: 95

Domestic Accredited Certifying Agents:

Foreign Accredited Certifying Agents:

Media Help

o **To view PDF files you must have Adobe Acrobat Reader installed on your computer.**



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Job Opportunities

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Box 11558
Eugene OR 97440

Street address

2495 Hilyard Street,
Suite B
Eugene, OR 97405

ph: 541-343-7600
fx: 541-343-8971

OMRI will change Review Program fees and update forms, effective July 1

June 20, 2008

We sincerely thank those who submitted comments about the [new fee proposal](#). OMRI does not casually consider fee increases. The OMRI Board of Directors found that the staff proposal for higher application, renewal, and other fees in the Review Program is acceptable as [amended](#). The new fees and forms will be effective July 1, 2008. Read our [summary](#) [response to the comments](#).

Welcome to OMRI!

Founded in 1997, the *Organic Materials Institute* (OMRI) provides organic certifying services to manufacturers, and suppliers an independent of products intended for use in certified production, handling, and processing. OMRI is a nonprofit organization.

OMRI reviews applying products against [Organic Standards](#). Acceptable products are [Listed®](#) and appear on the [OMRI Product List](#).

OMRI also provides subscribers guidance on the acceptability of various material inputs in general under the National Organic Program.

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OMRI Publications

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The 2008 OMRI Products List

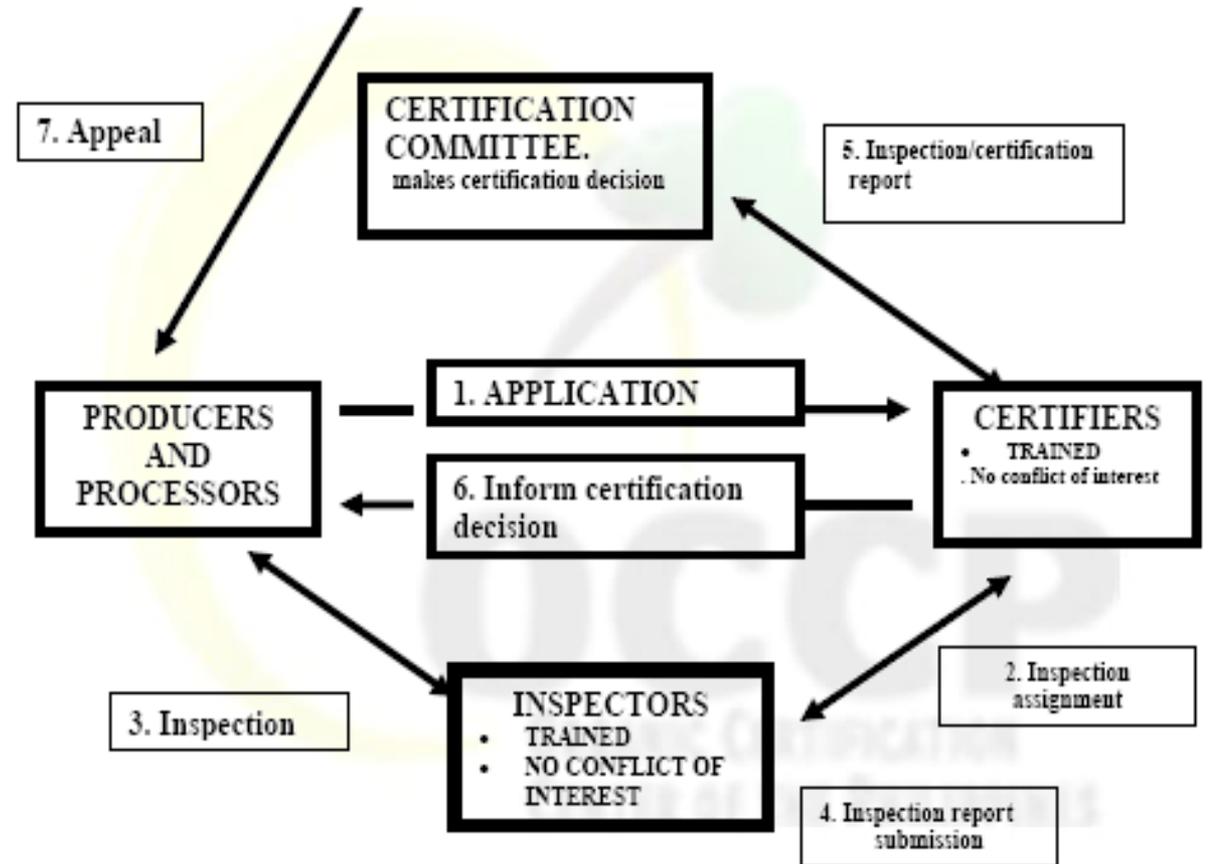
The *OMRI Products List* is the most complete directory of products for organic production or processing. The 2008 edition includes almost 1600 OMRI Listed® products.

[Learn how to get a copy.](#)



Search

About Us



Nutrient Dense Food

BEYOND Organic

- There is a movement for high quality food
- High vitamins, high minerals, high sugar
- This food has healing powers
- Brix^o as an indicator
- The refractometer



Refractive Index of Crop Juices -- Calibrated In % Sucrose Or °Brix

	Poor	Average	Good	Excellent
FRUITS				
Apples	6	10	14	18
Avocados	4	6	8	10
Bananas	8	10	12	14
Blueberries	10	14	16	20
Cantaloupe	8	12	14	16
Casaba	8	10	12	14
Cherries	6	8	14	16
Coconut	8	10	12	14
Grapes	8	12	16	20
Grapefruit	6	10	14	18
Honeydew	8	10	12	14
Kumquat	4	6	8	10
Lemons	4	6	8	12
Limes	4	6	10	12
Mangos	4	6	10	14
Oranges	6	10	16	20
Papayas	6	10	18	22
Peaches	6	10	14	18
Pears	6	10	12	14
Pineapple	12	14	20	22
Raisins	60	70	75	80
Raspberries	6	8	12	14
Strawberries	6	10	14	16
Tomatoes	4	6	8	12
Watermelons	8	12	14	16
GRASSES				
Alfalfa	4	8	16	22
Grains	6	10	14	18
Sorghum	6	10	22	30

	Poor	Average	Good	Excellent
VEGETABLES				
Asparagus	2	4	6	8
Beets	6	8	10	12
Bell Peppers	4	6	8	12
Broccoli	6	8	10	12
Cabbage	6	8	10	12
Carrots	4	6	12	18
Cauliflower	4	6	8	10
Celery	4	6	10	12
Corn Stalks	4	8	14	20
Corn (Young)	6	10	18	24
Cow Peas	4	6	10	12
Cucumbers	4	6	8	12
Endives	4	6	8	10
English Peas	8	10	12	14
Escarole	4	6	8	10
Field Peas	4	6	10	12
Green Beans	4	6	8	10
Hot Peppers	4	6	8	10
Kohlrabi	6	8	10	12
Lettuce	4	6	8	10
Onions	4	6	8	10
Parsley	4	6	8	10
Peanuts	4	6	8	10
Potatoes	3	5	7	8
Potatoes, Sweet	6	8	10	14
Romaine	4	6	8	10
Rutabagas	4	6	10	12
Squash	6	8	12	14
Sweet Corn	6	10	18	24
Turnips	4	6	8	10

Within a given species of plant, the crop with the higher refractive index will have a higher sugar content, higher mineral content, higher protein content and a greater specific gravity or density. This adds up to a sweeter tasting, more mineraly nutritious food with lower nitrate and water content, lower freezing point, and better storage attributes.



International Ag Labs, Inc.
P.O. Box 788
800 West Lake Ave.
Fairmont, MN. 56031

Phone: 507-235-6909
Fax: 507-235-9155
Email: info@aglabs.com

www.aglabs.com

This Chart was originally developed by Dr. Carey Reams.

The Brix Scale

A relative index of food quality

Within a given species of plant, the crop with the higher refractive index will have a:

- higher sugar content
- higher mineral content
- higher protein content
- greater specific gravity or density

This adds up to sweeter taste, higher mineral density and more nutrition as well as food with lower nitrate and water content, a lower freezing point, and better storage attributes.

Cabbage

Poor	Average	Good	Excellent
------	---------	------	-----------

6 8 10 12

Next step: ORAC rating



FOOD & NUTRITION SERVICES

Oxygen Radical Absorbance Capacity

ORAC rating is a laboratory analysis that provides an overall measure of a food's antioxidant activity. The higher the ORAC score, the greater is the food's antioxidant capacity. ORAC tests are often used to compare the antioxidant activities of different foods (fruits, vegetables, juices, wines, etc.).

Specific Minerals \$\$\$



Mango



Tomato





- High quality milk is:
- ✓ Raw (unpasteurized)
 - ✓ Fresh (not stale)
 - ✓ Good Brix ($>10^{\circ}$)
 - ✓ From Grass Fed cows
(no soy or grain)

Brix[°] as a quality indicator

Got High Brix?