

Farmer-Training Materials on Indigenous Microorganisms (IM)

Source:

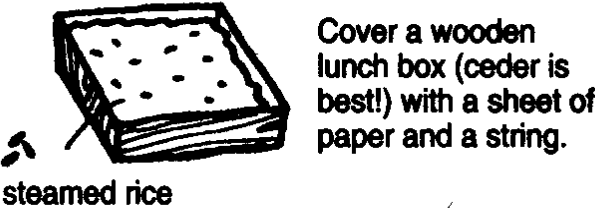
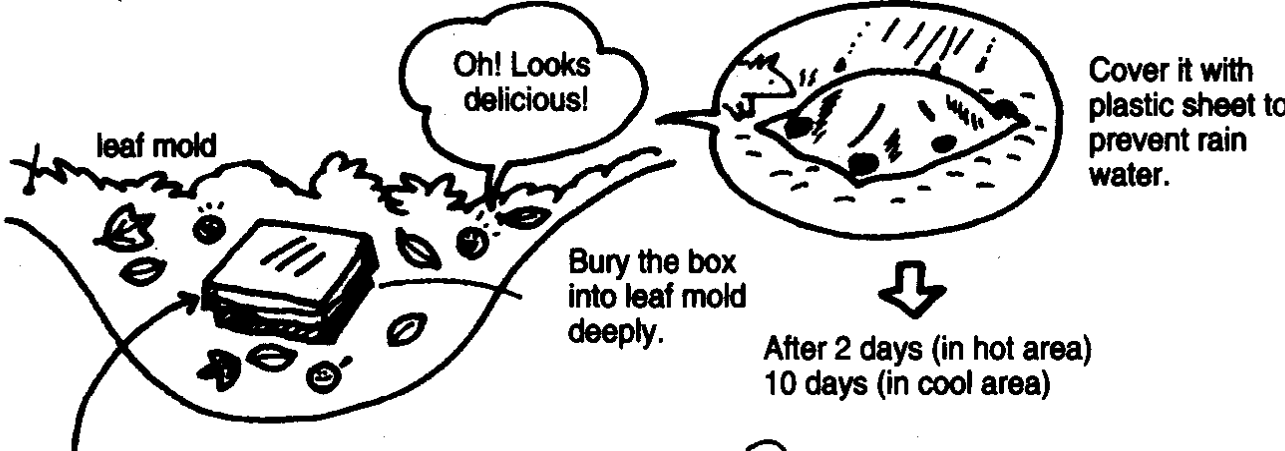
***Korean Natural Farming: Indigenous
Microorganisms and Vital Power of
Crop/Livestock***

**Han Kyu Cho and Atushi Koyama
Korean Natural Farming Association,
1997**

172 pages

(from local forest)
Indigenous Microorganisms 1

Collect IMO at local forest

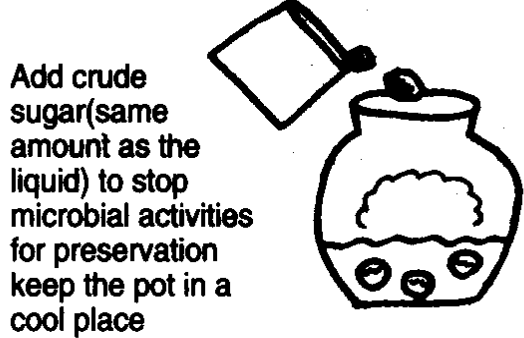
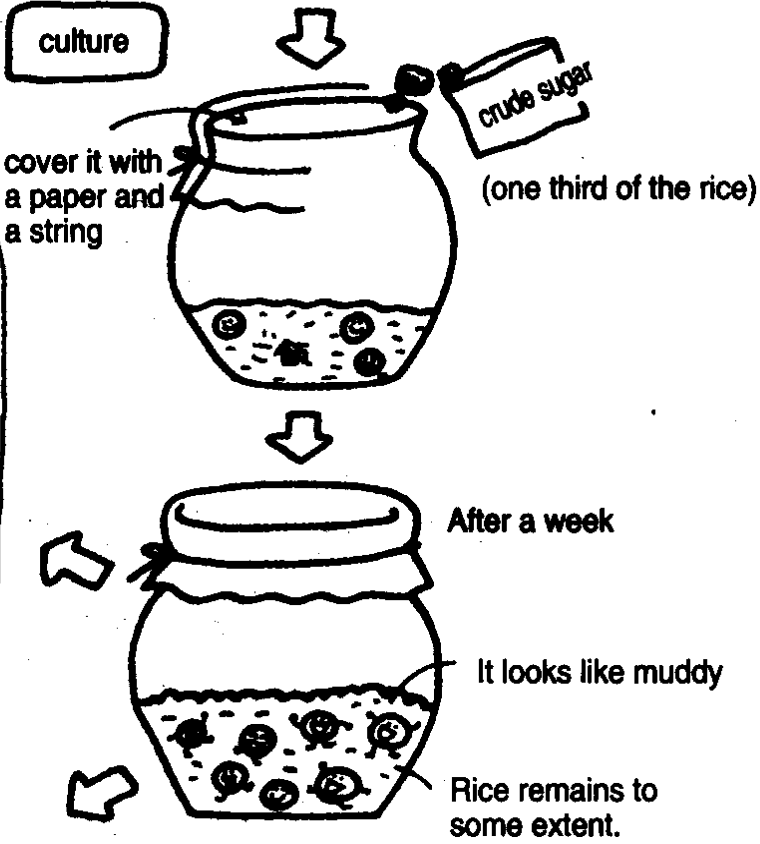


How to use

0.2% conc. of the liquid can be used. Apply to rice bran.

Spray FPJ and FFJ also.

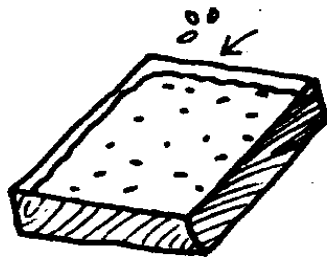
Let's start working!



(from rice straw)
Indigenous Microorganisms 2



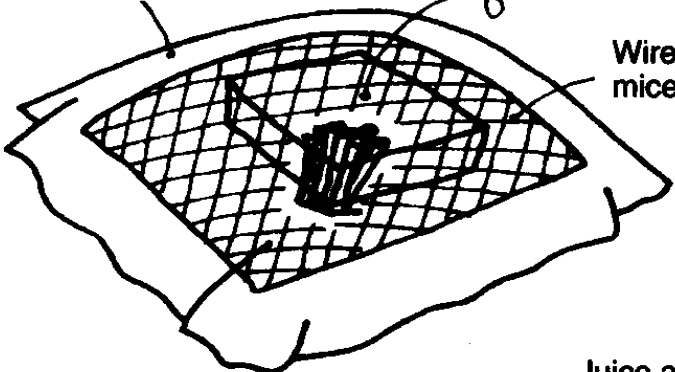
Rice after harvesting



Steamed rice packed in a wooden lunch box

Tarp (plastic sheet) for preventing rainwater

Put the box face down on the rice after harvesting

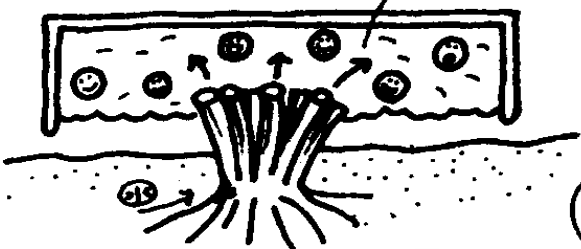


Wire fence for preventing mice



I want to have the rice!

Juice and microorganisms from rice plant can be collected.

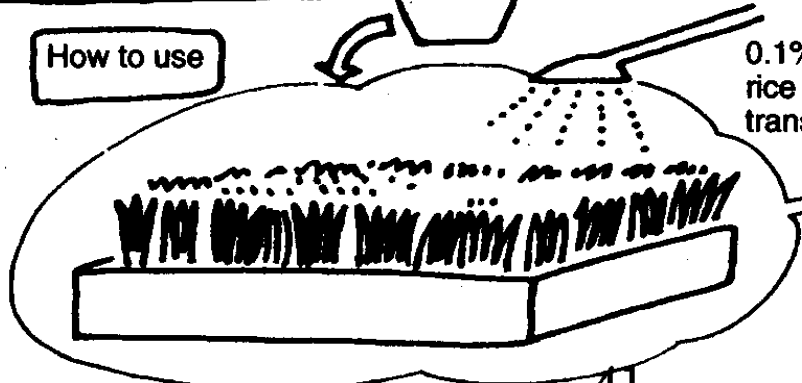


0.2% conc. is good for broadcasted paddy fields.

Mix the steamed rice with crude sugar and keep it for a week.



How to use



0.1% conc. is good for rice seedling for transplanting.



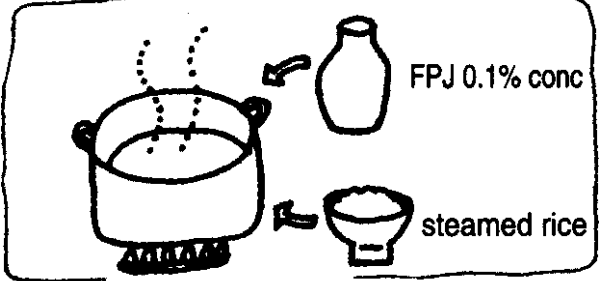
Soil may become white. That is IMO excellent!

(through mixing leaf mold with rice bran)
Indigenous Microorganisms 3

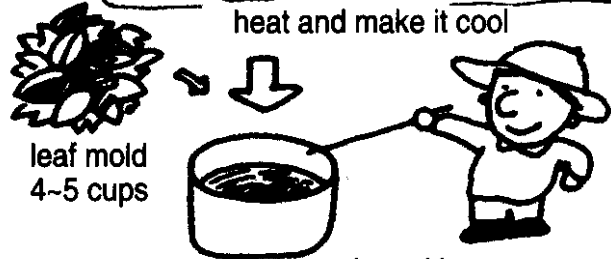
Take leaf mold with white hypha from a forest.



Microorganisms!
 with white hyphae.

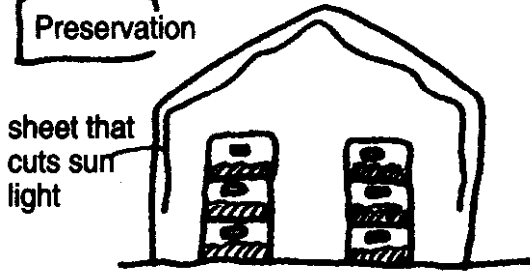


heat and make it cool



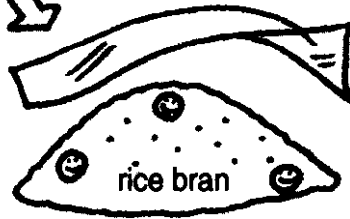
mix and leave it a day

Preservation



sheet that cuts sunlight

Prevent it from rainwater.

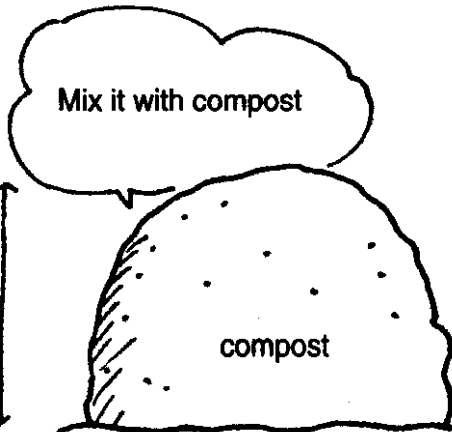


Cover it with straw mat or plastic sheet.

Culture in rice bran

Application of FPJ and FAA makes it better.

After 5 days (20~25°C)



Mix it with compost

60~70cm

compost



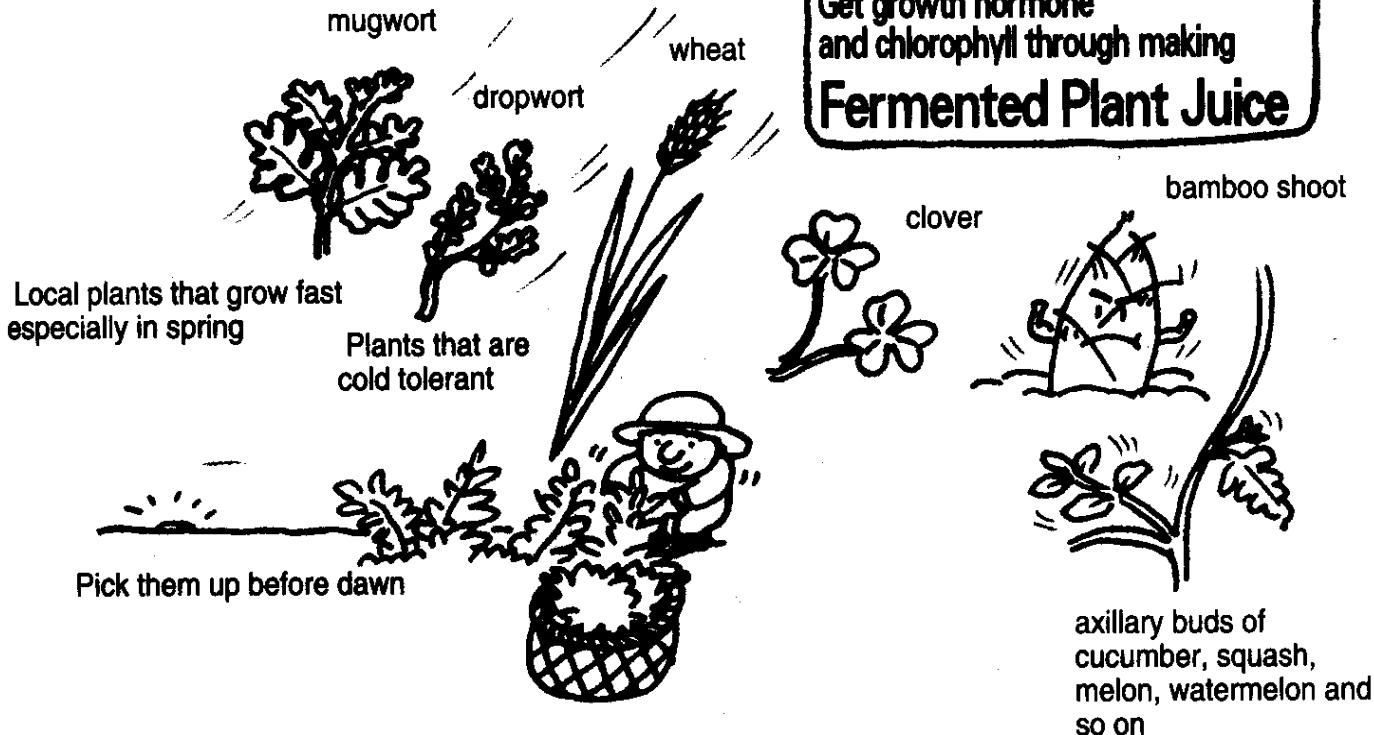
It becomes 40~45°C due to fermentation

Mix it with the same amount of local soil

To fields!

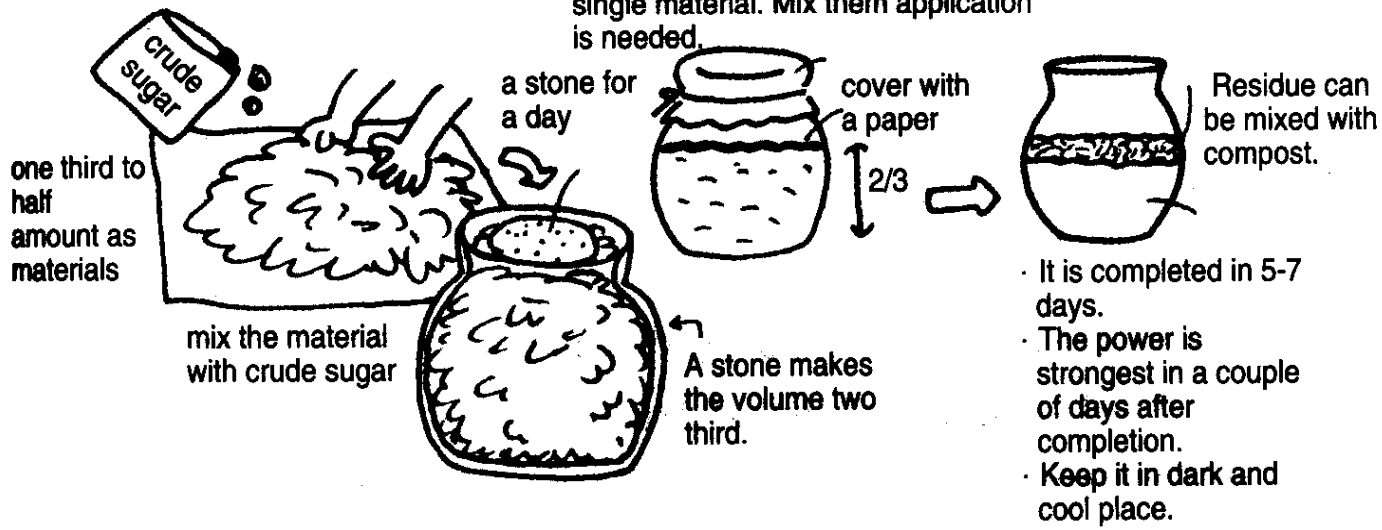
Put it on the surface of the soil

Get growth hormone and chlorophyll through making **Fermented Plant Juice**



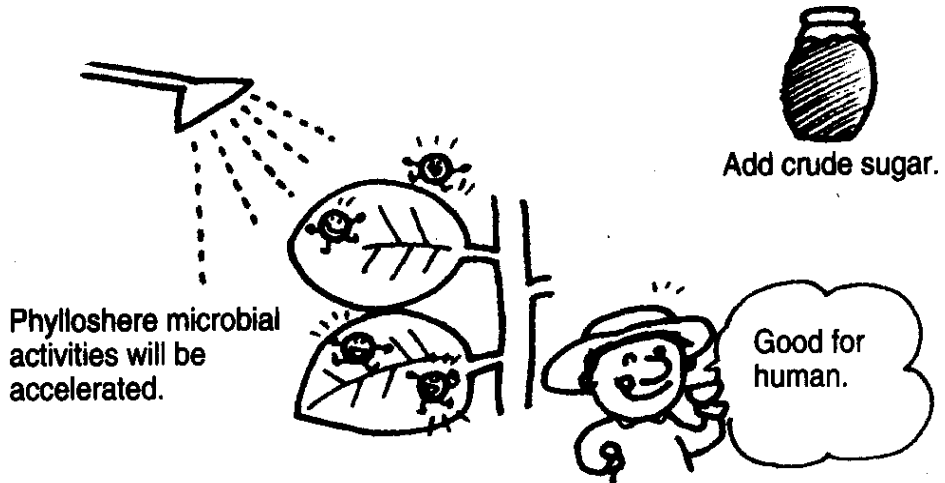
How to make it fermented

- Do not wash the plants
- Make several kinds of FPJ with a single material. Mix them application is needed.



How to use

0.1~0.2% conc. FPJ is applied on leaf surface and into compost with IMO.



Fermented Fruit Juice

Mango, papaya and banana are excellent in the tropics



mulberry

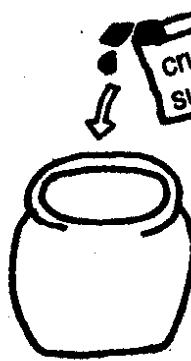


strawberry



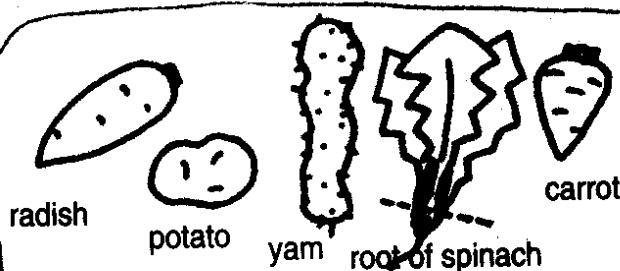
fig

main materials



crude sugar

Summer: 1.2kg
Winter: 1.0kg
(for 1kg of materials)



radish

potato

yam

root of spinach

carrot

sub materials

Cassava and sweetpotato are also good.

When abundant main materials are available, make several kinds of FFJ with a single material. Mix them when application.



When the amount of materials is small, make FFJ with mixed materials

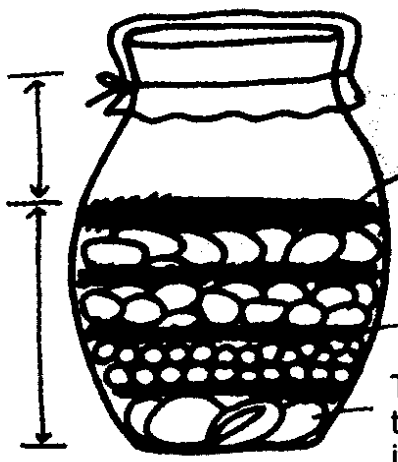
persimmon

orange



not recommended
(only appropriate when applied to persimmon and orange)

less than two third



much crude sugar at the top

crude sugar

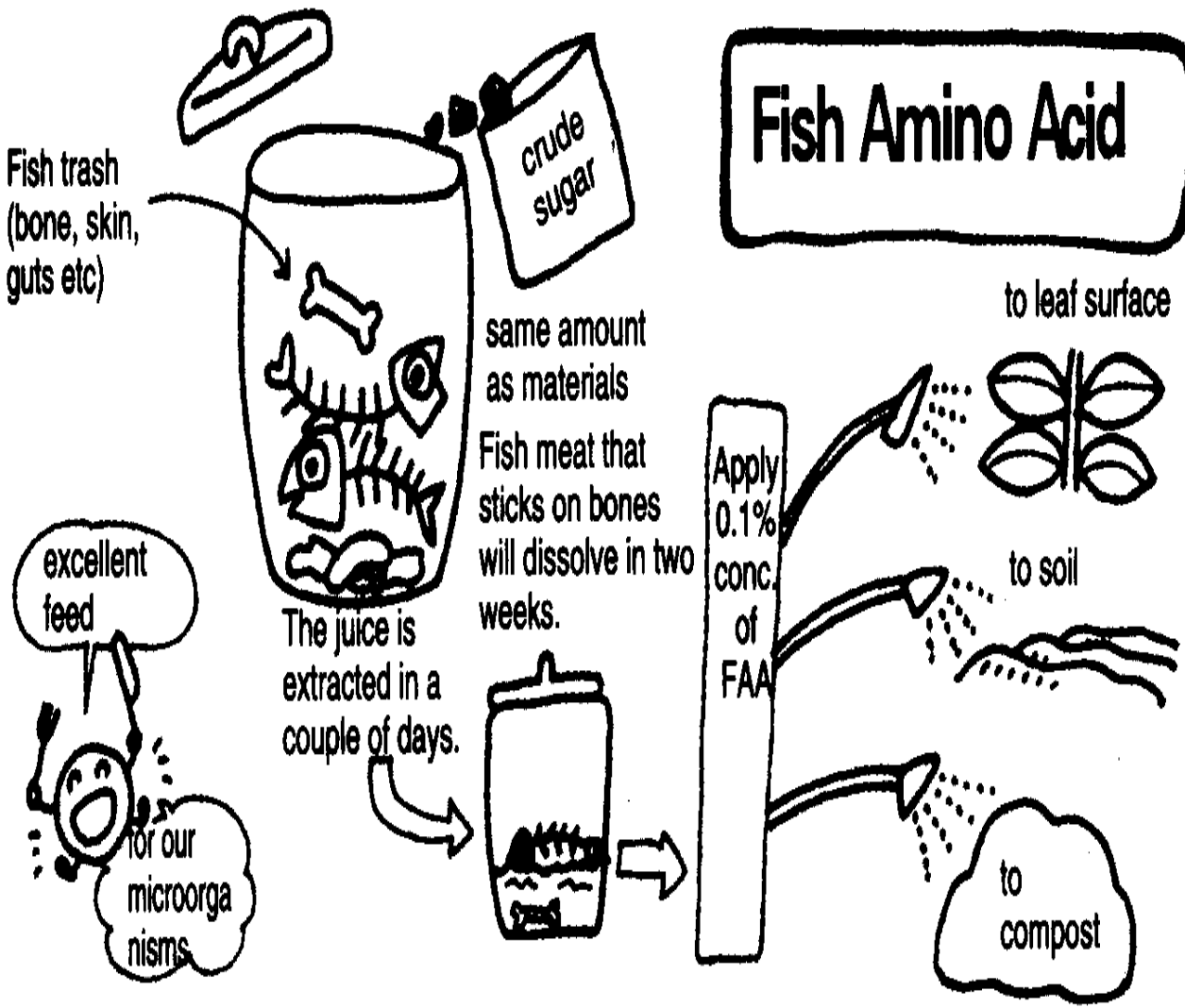
The more sugar material contains, the nearer to the bottom of the pot it should be put.

Good for human as a beverage and a seasoning.



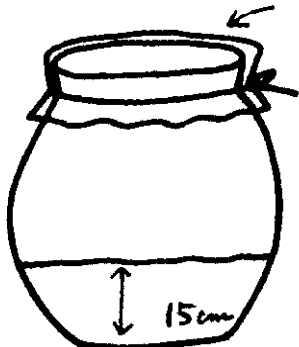
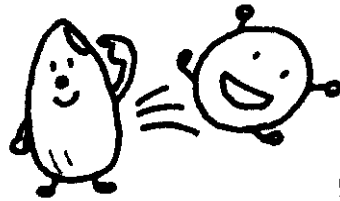
delicious!

Fish Amino Acid



Lactic Acid Bacteria Serum, which defend plants

rice wash water



cover it with a paper

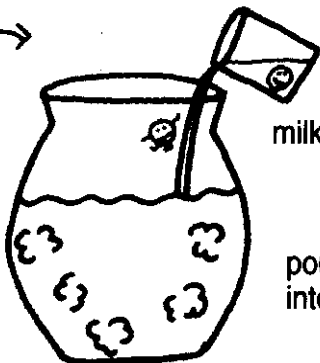
15cm in depth even in large pot is good for aeration in the liquid.

Put the pot in shade for 5-7 days



liquid with LAS

Primary culture

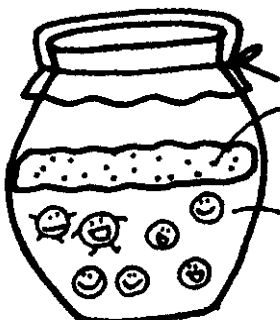


liquid with LAS 1

milk 10

pour the liquid with LAS into milk.

after 5-7 days



fat, protein and carbohydrate

Lactic Acid Bacteria Serum (light yellow)

Secondary culture

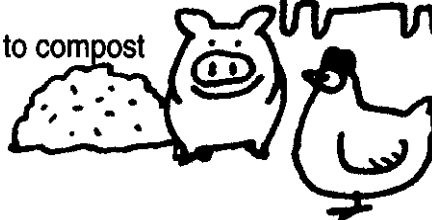


3% conc. of LAS

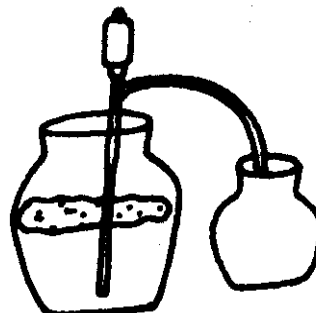
to livestock as a drink



to compost



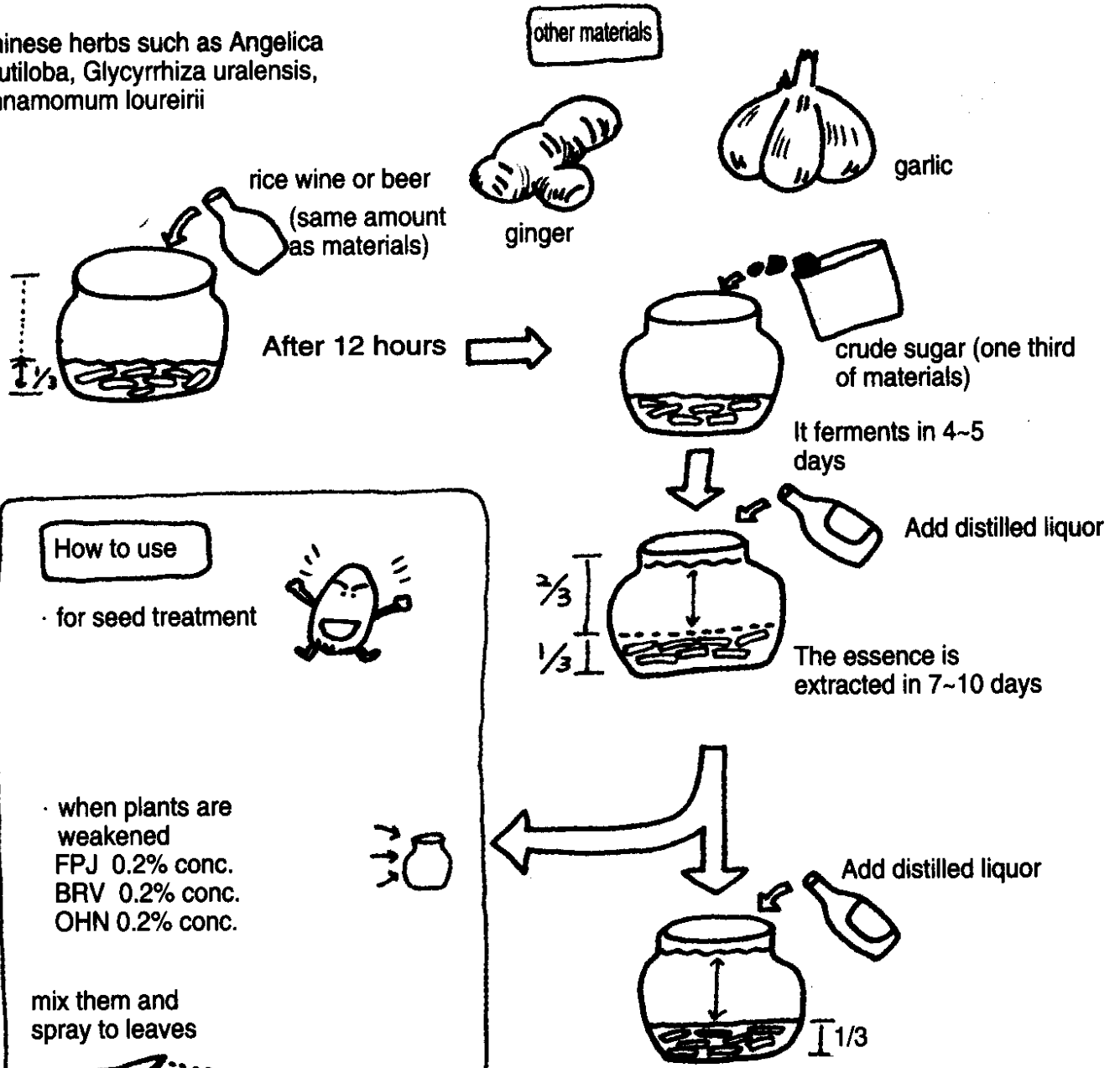
to plant leaves



Add crude sugar (same amount as LAS) to keep it at room temperature.

Oriental Herbal Nutrients

chinese herbs such as *Angelica acutiloba*, *Glycyrrhiza uralensis*, *cinnamomum loureirii*



Downy mildew and powdery mildew will be stopped.

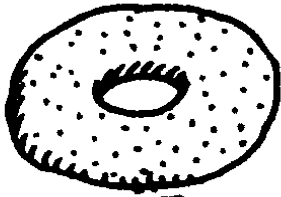
The essence can be extracted 5 times.



Spraying the mixture of FPJ, BRV, and OHN every 7~10days makes plants strong.

Catch indigenous microorganisms to make "koji" or malt

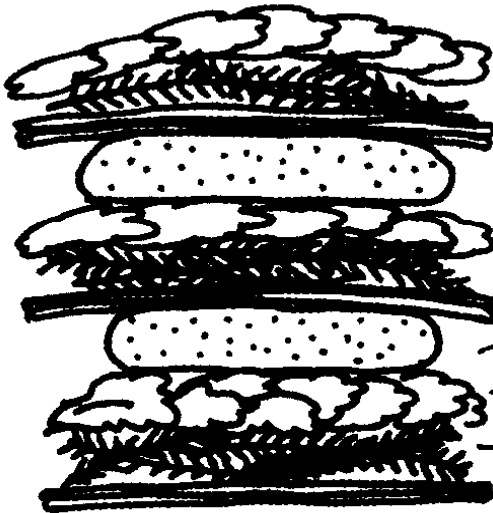
Rice wine for farming



Make two "doughnut" with whole ground wheat (raw, 65~70% water contents)



Put them where neither sun light nor rain for 5 days



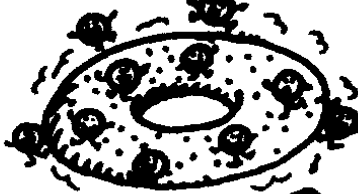
"doughnut"

dried mugwort

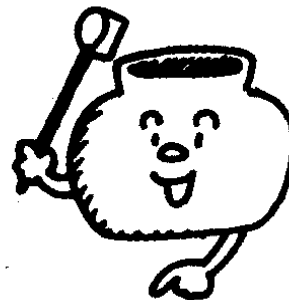
ceder leaves

rice straw

after 5 days



a lot of indigenous microorganisms for "koji"



mix "doughnut" with cooked rice

rice and rice bran



cook and cool down (20~25°C)



Add water to make the stuff muddy

It ferments in 5~7 days, becoming sweet.

As it is for farming, fermentation is more important than taste.



Preservation



Bury the pot or keep it in cool place. Use it before it becomes vinegar.

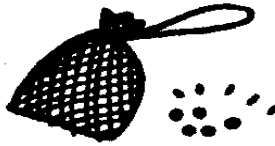
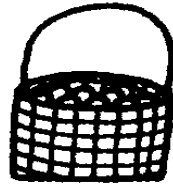
Seed and seedling Treatment

Modern seeds are weak



Seed Treatment

soak



A strainer and gauze are useful.

Treatment Liquid

FPJ 0.2%

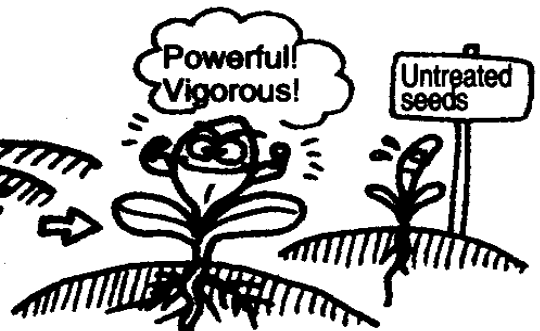
BRV 0.2%

OHN 0.2%

Soak 4-8 hours. The slower seeds germinate, the longer they should be soaked.

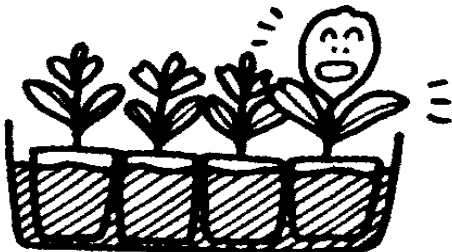


After soaking, sow before getting dried. (not good for a sower)



- thick cotyledon
- good root development
- tolerable to diseases

Seedling treatment



soak 15 seconds

Apply the treatment liquid after transplanting



The changeover period treatment responds to "morning sickness" of plants.

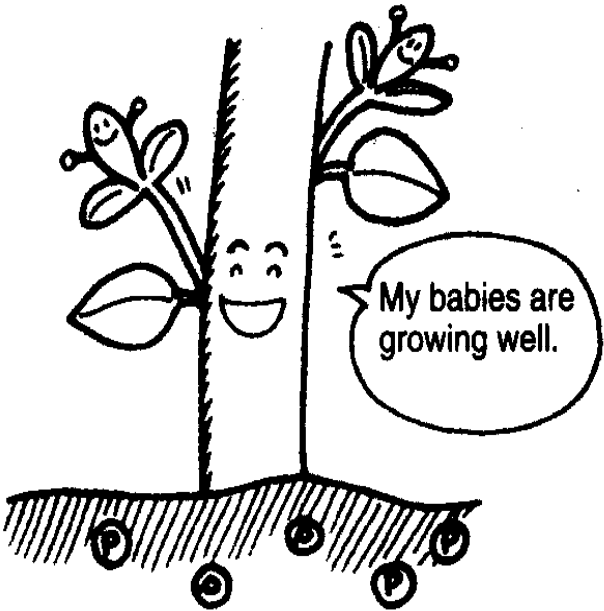
Plants become "morning sickness" when floral differentiation



Sour things are good for morning sickness.



Calcium phosphate is good for plants' morning sickness. (Ash made from sesame stems or soybean stems is excellent!)



When should they be applied?

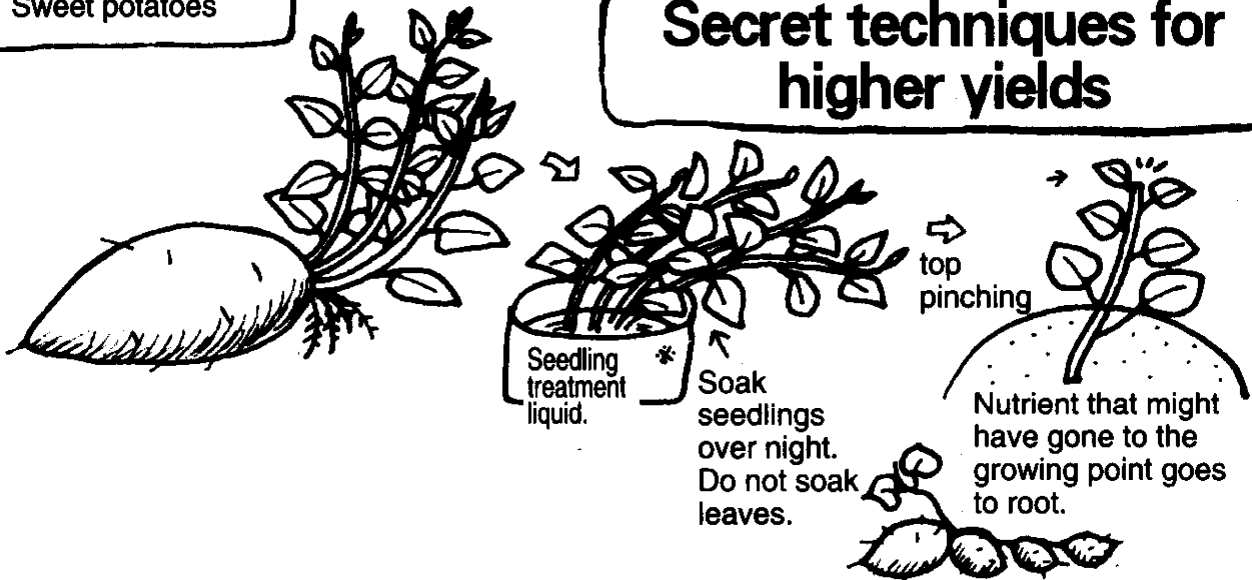
A week before floral differentiation (A week is needed for absorption)



- leaf crop such as spinach
-when 2-3 leaves
- crop with standing core, such as cabbage and raddish
-standing → lying → when standing again
- fruit crop such as tomato and cucumber
-when the first flower comes out

Sweet potatoes

Secret techniques for higher yields

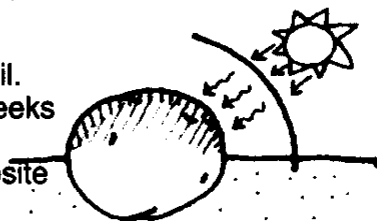


Potatoes

(Sunlight treatment)

Potatoes contaminated with virus will go rotten. Slightly contaminated ones will get well.

- Make a tunnel on sandy soil.
- Bury half for a week two weeks before planting
- Turn over to have the opposite side get sunlight
- Potatoes become green.
- Cut with a bud and plant.



Soak into treatment liquid

Soybeans



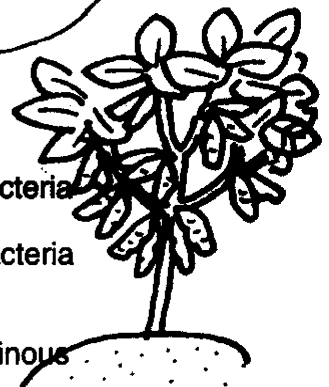
Mix the materials with seeds at the fields. Then plant.

10 : 1 : 0.1 : 1/

Soy beans Soil in which soybeans were planted previously or soil clover grows Crude sugar FPJ 0.5% conc



Soil with leguminous bacteria
Leguminous bacteria (N supplier)
Crude sugar (feed for leguminous bacteria)



There is no waste around a plant



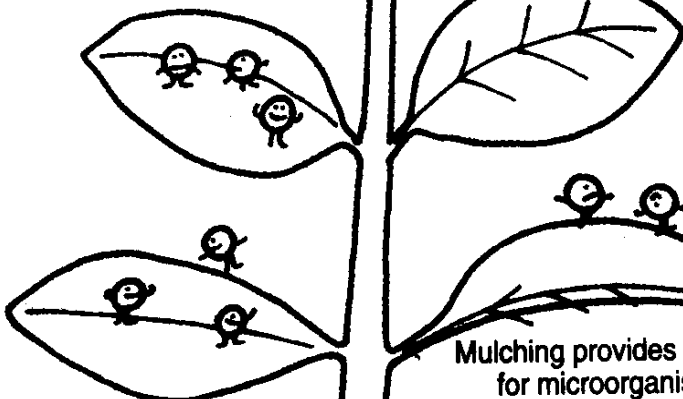
Solar radiation
↓
photo synthesis
↑
growth

Diseases



Phyllosphere microbes

- lactic acid bacteria
- yeast
- other various microorganisms



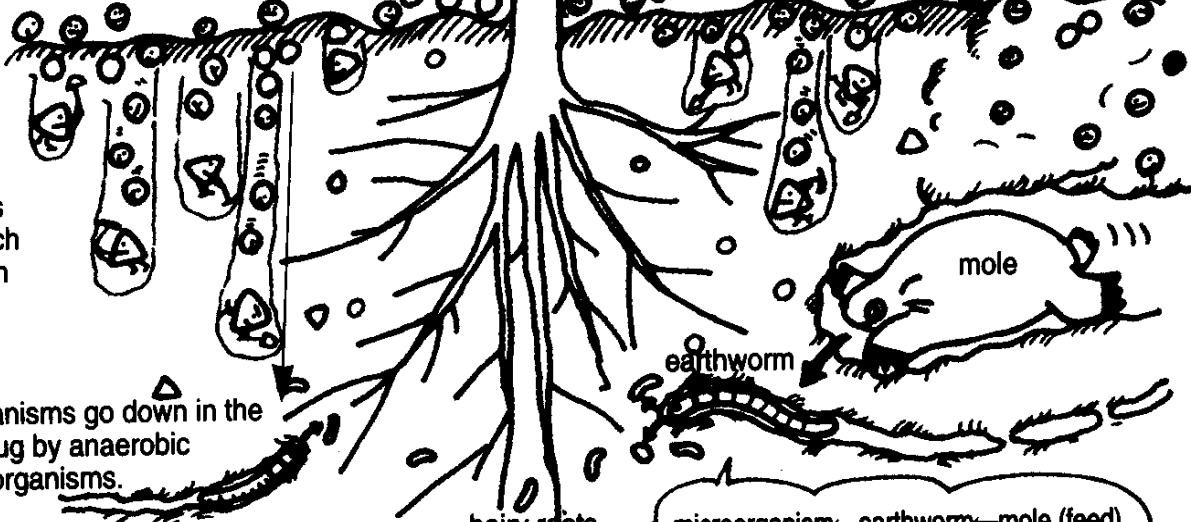
Moles dig "tunnels" to make aerobic microorganisms happy

Mulching provides housing for microorganisms.

aerobic microorganisms

Anaerobic microorganisms are "tillers", which go down deep in soil.

Aerobic microorganisms go down in the "tunnels" dug by anaerobic microorganisms.



hairy roots

microorganism ← earthworm ← mole (feed)

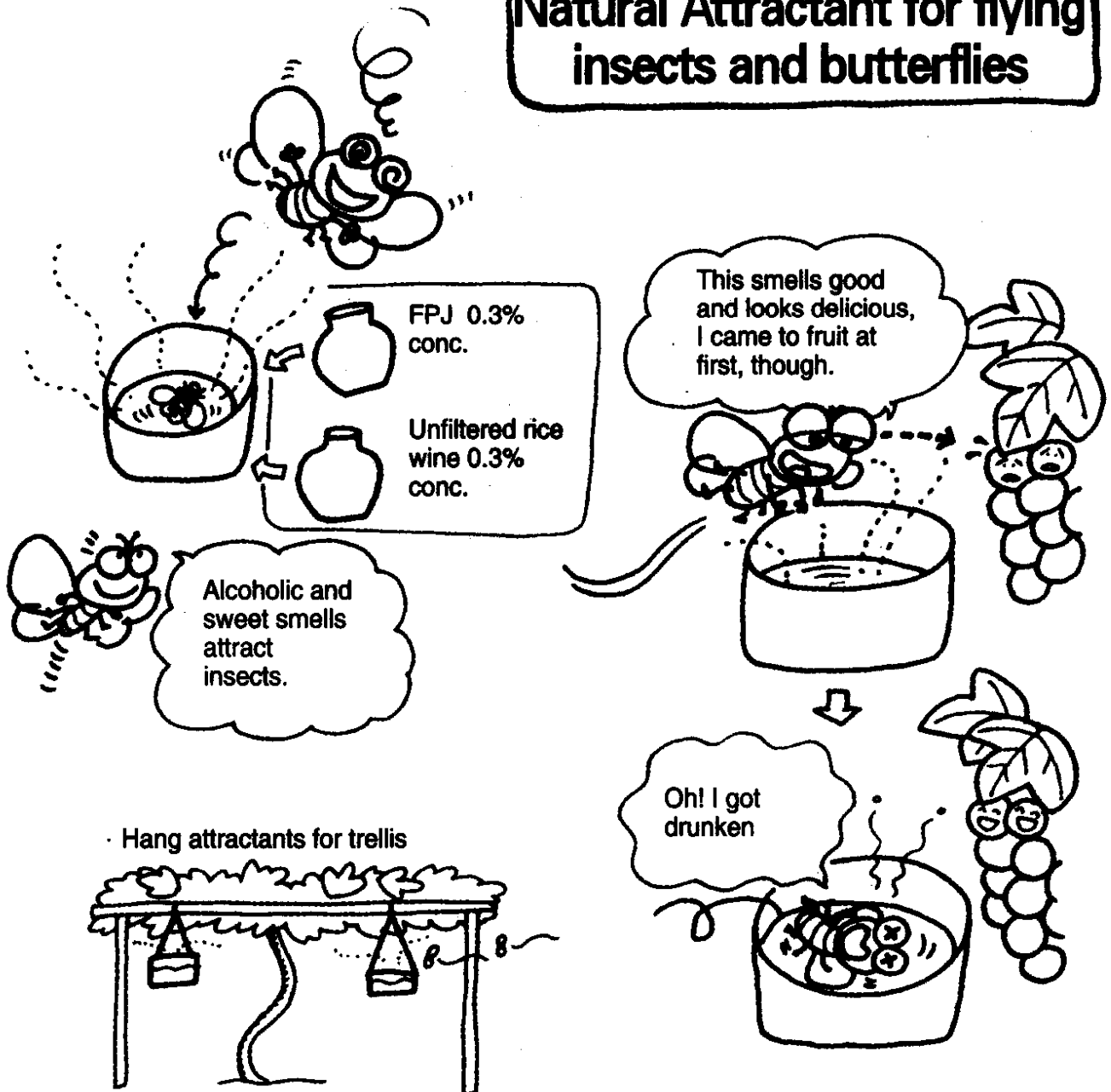
Microorganisms secrete amino acid, fatty acid, vitamins and enzymes.

Hairy roots secrete feed for microorganisms.

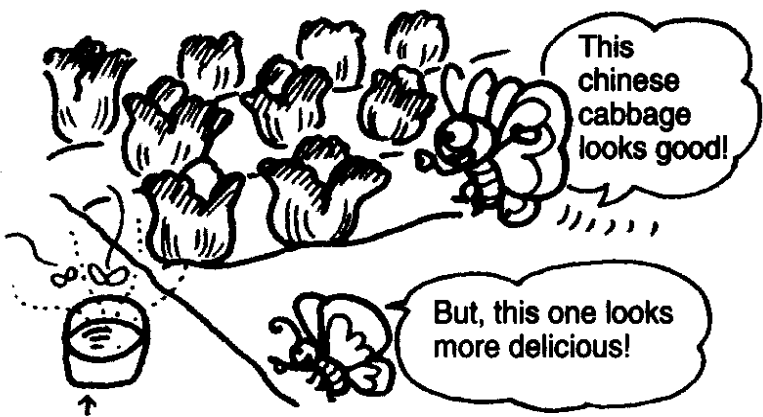
Microorganisms

<Mutual dependency>

Natural Attractant for flying insects and butterflies



· Put attractants in places in the fields



Rain water is no problem.