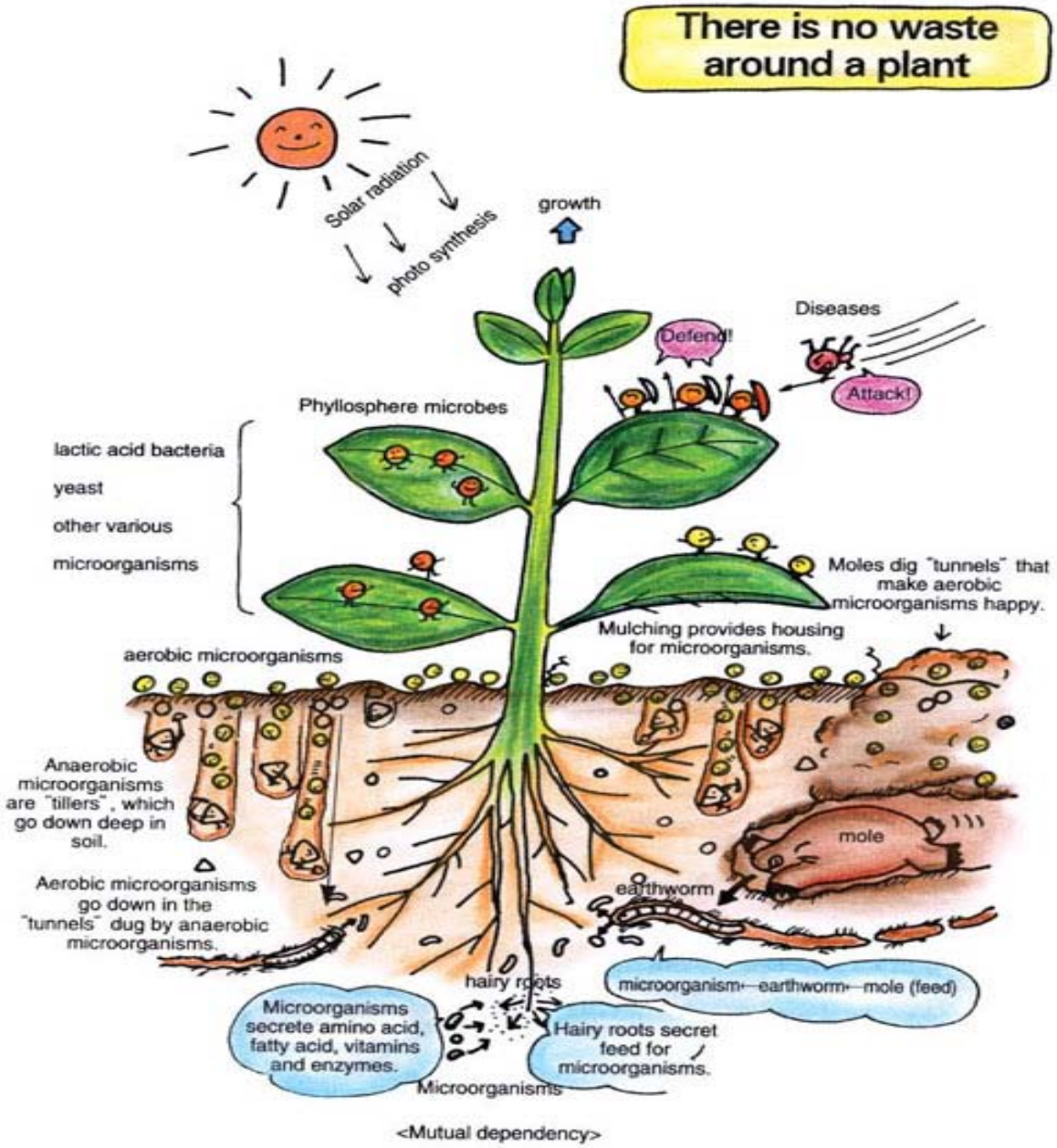
ISO9001 ISO14001 CGNF

Natural Farming

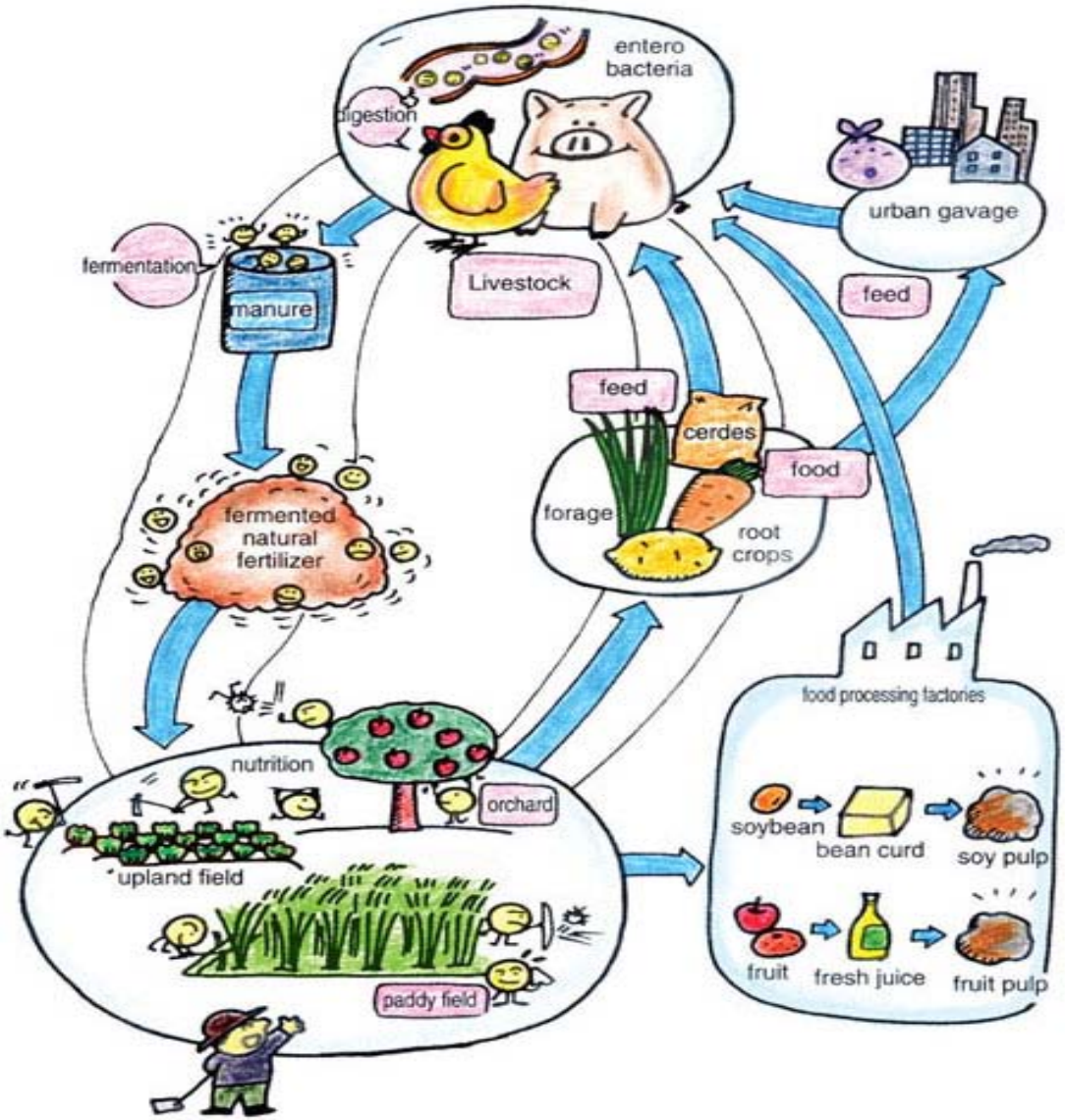
Nutritional Cycle

Cho Global Natural Farming(CGNF)


There is no waste around a plant
Solar radiation
photo synthesis
growth
Diseases
Defend!
Attack!
Phyllosphere microbes
lactic acid bacteria
yeast
other various
microorganisms
Moles dig "tunnels" that 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.
mole
earthworm
hairy roots
microorganism→earthworm→mole (feed)
Microorganisms secrete amino acid, fatty acid, vitamins and enzymes.
Hairy roots secret feed for microorganisms.
Microorganisms
<Mutual dependency>

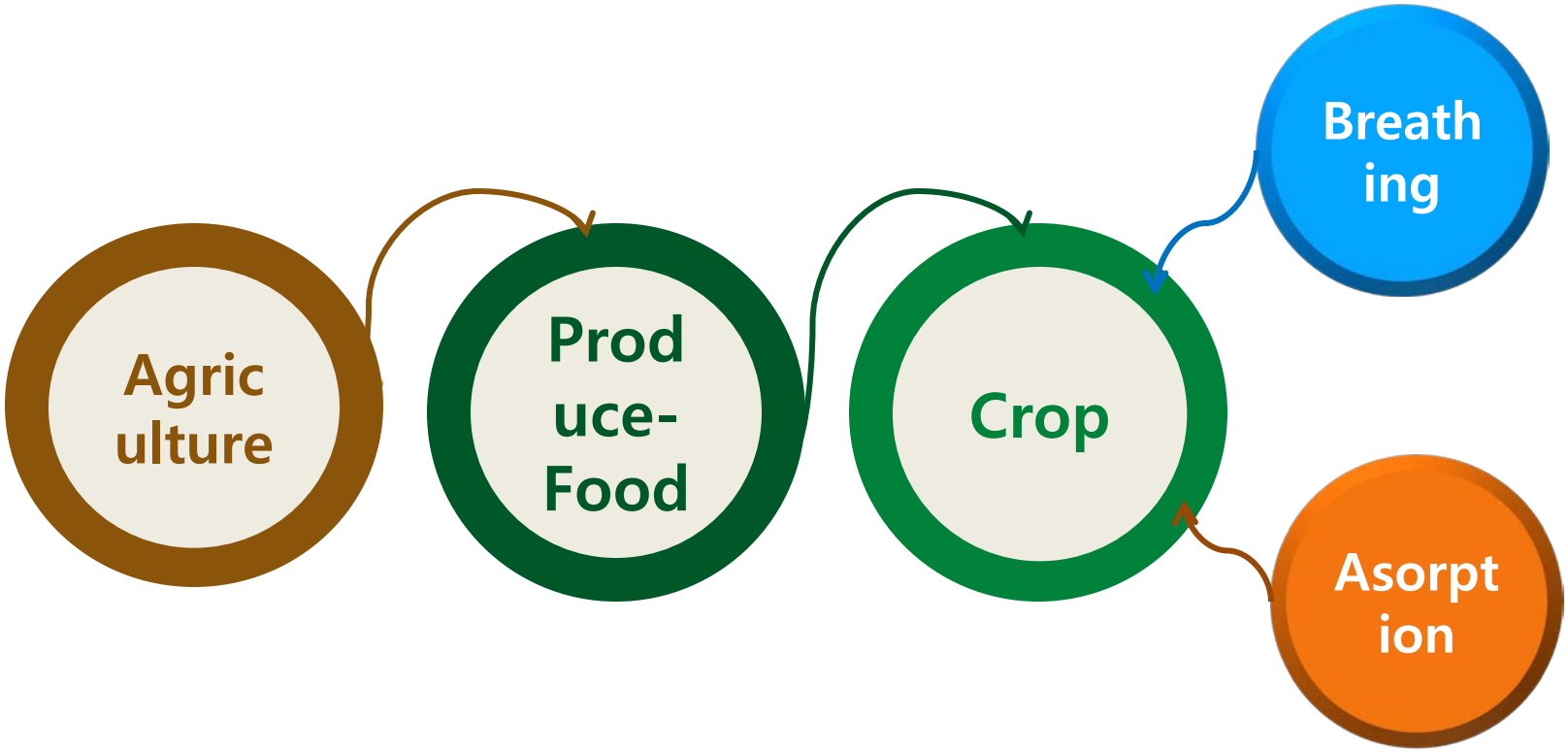
Microorganisms make everything useful.

in the recycling system



CGNF

Natural Farming's basic idea



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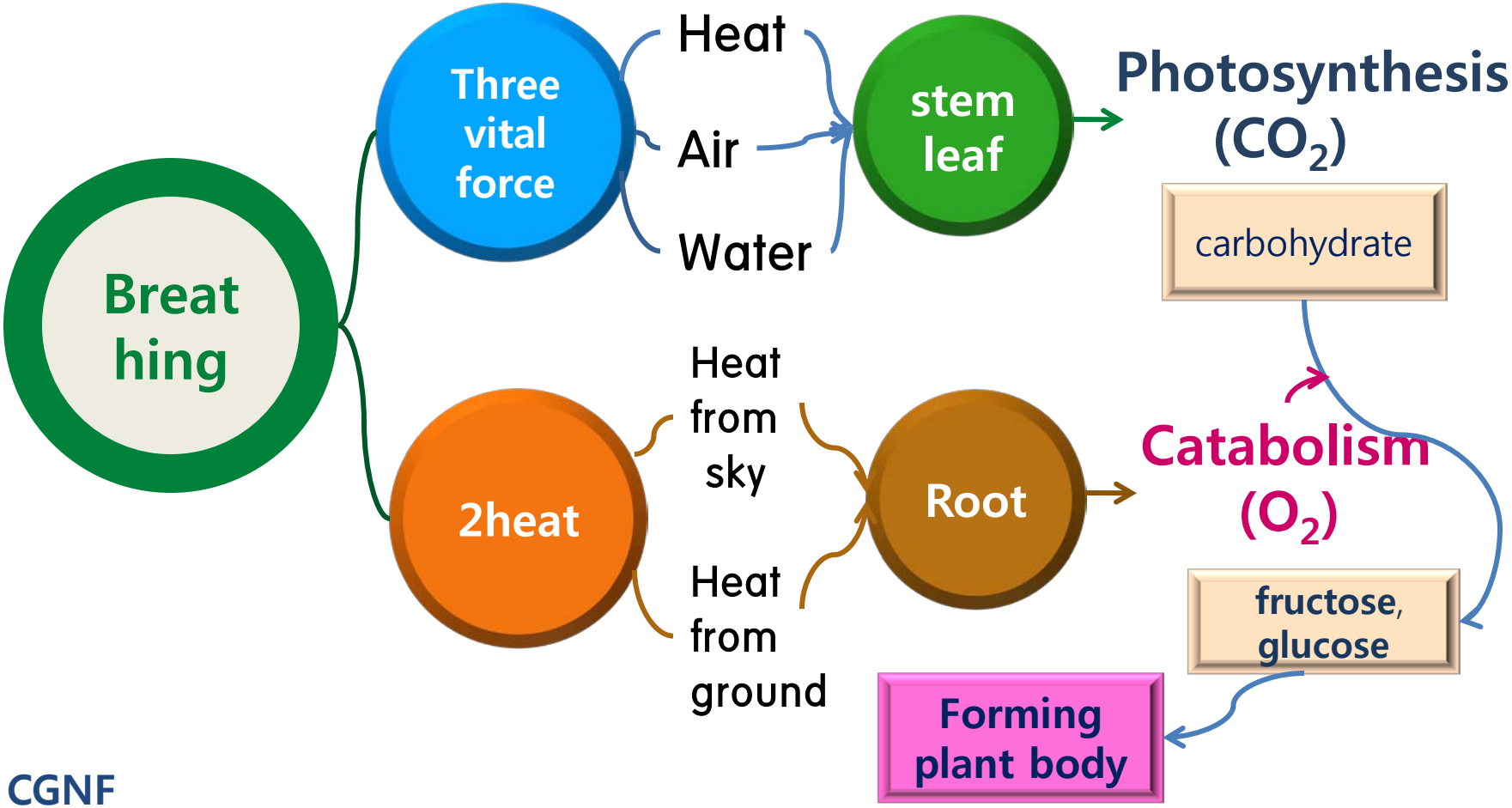
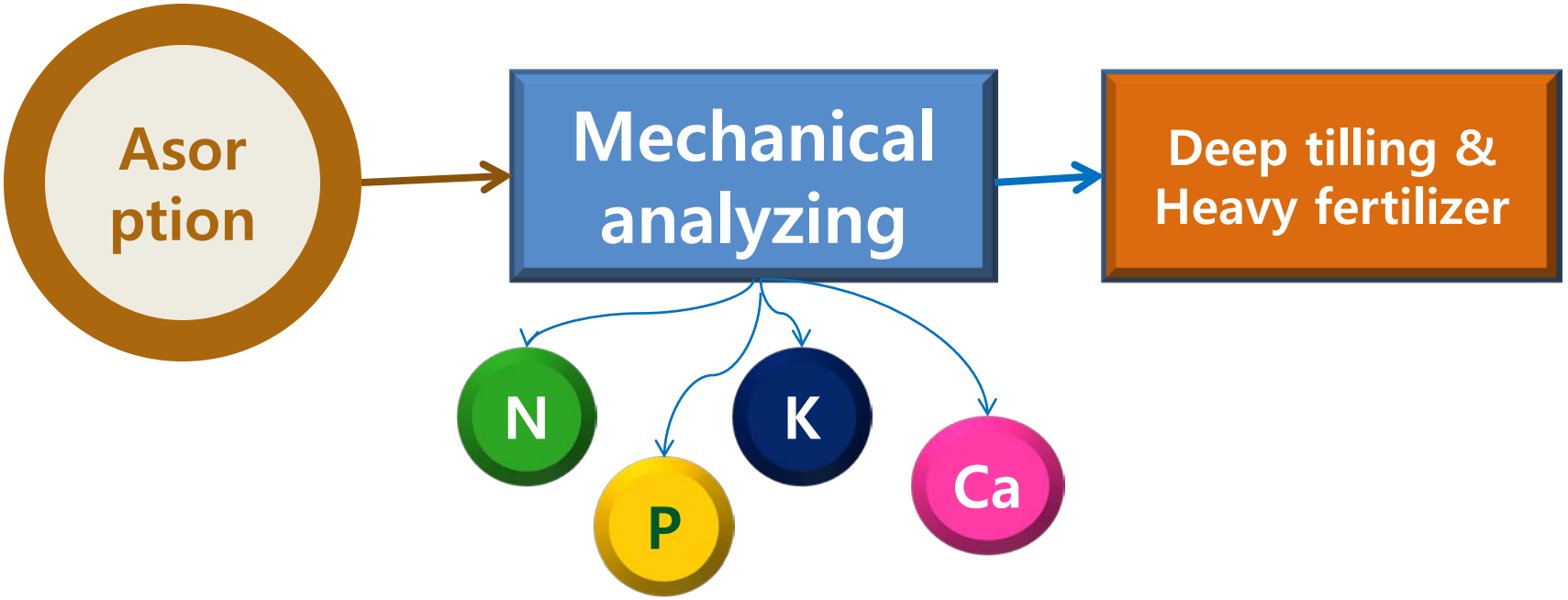


Conventional practices farming's basic idea



Physical environment of root

- Heat insulation capacity
- capacity to retain water
- Nutrient holding capacity
- Aeration

Natural Farming's basic idea

Deep tillage & Heavy fertilizer	Shallow tillage & light fertilizer (Natural Farming)
Weak roots	Healthy roots
Artificial environment	Natural environment
Mechanical, chemical technology	Life, scientific technology
Intervention	Autonomy
Other's will	Own will
Lack of competitiveness,	Strong competitiveness
high cost	Low cost

Natural Farming's basic idea

Past tense	Future tense
Chemicals	Science of Life
Application by analysis	Right period, right fertilizer, right amount
Selective absorption	The best condition is dynamic
Man-made environment Reliant, negative, passive	Self-supporting environment Positive, active, self-supporting
Materials	Object(material+life)
Non-life	Life
Nutrients	Nutrient source

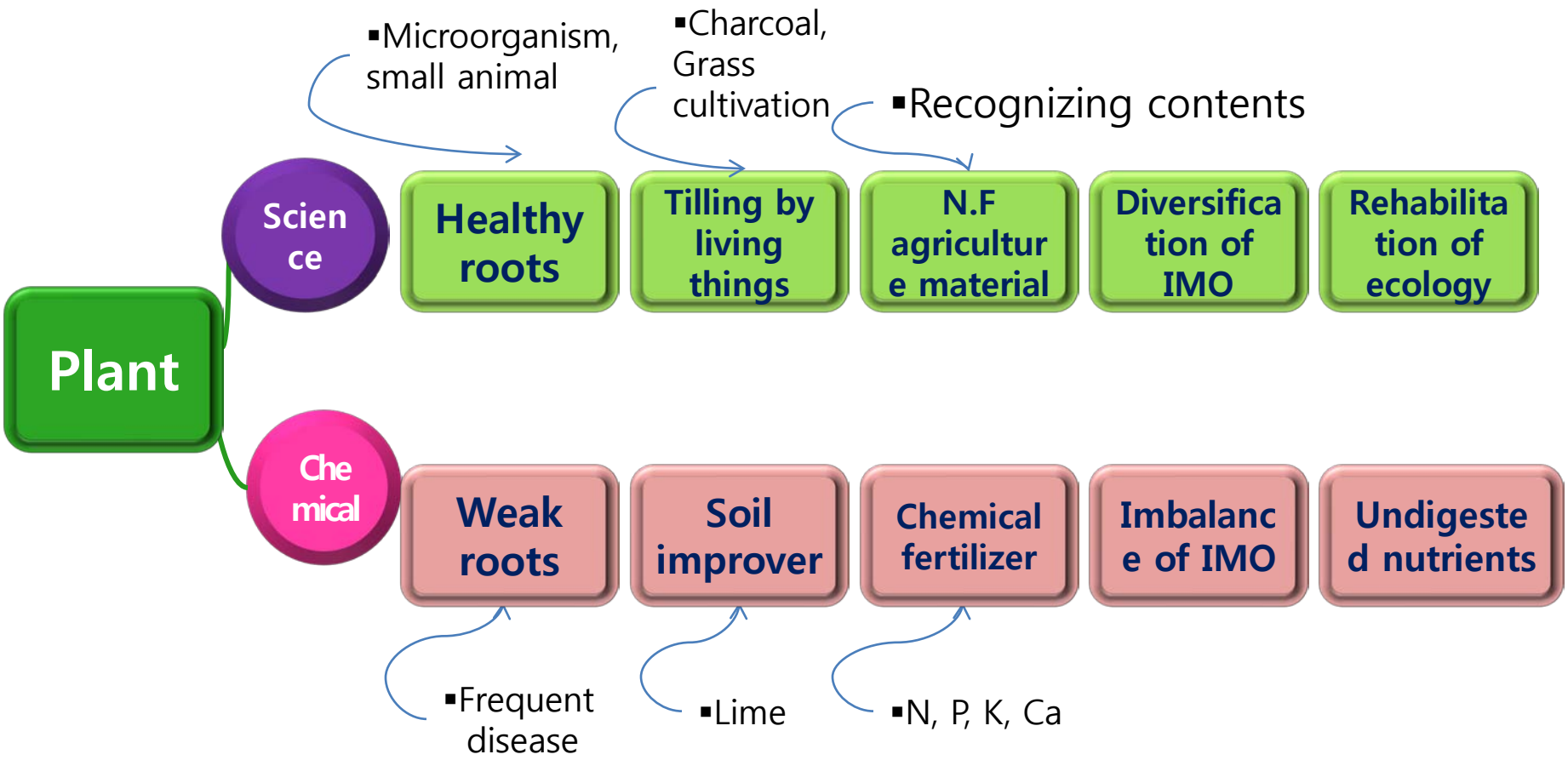
Environment of Root

Natural water supply	Natural fertilizer supply
Rain water	Heaven-fertilizer: Air
Surface water	Surface fertilizer: organic matter
Underground water	Underground fertilizer: micronutrient
❖ Microbes & Small animal Creating reservoir (80~85% moisture)	❖ Microbes & Small animal Underground fertilizer plant (Carbon 70kg , Nitrogen 11kg/10a)

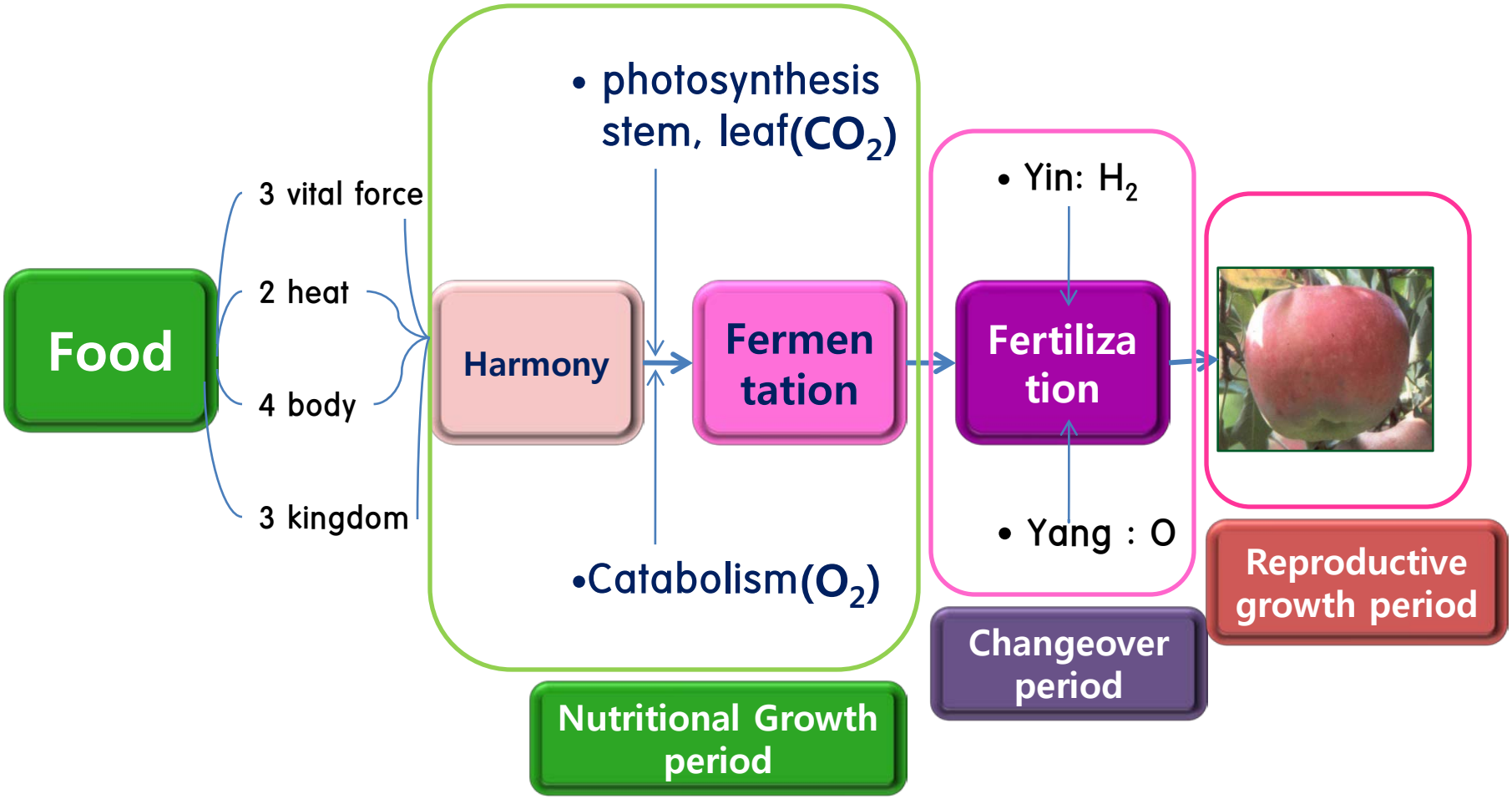
Nutrients & Nutrients source

Nutrients	Nutrients source
Material	Object
Organic matter	Inorganic matter+organic matter
closed	Open
Absorption	Vital
Passive	Active
Negative	Positive
Dependent	Independent
Non-life	Life
Religion	Faith

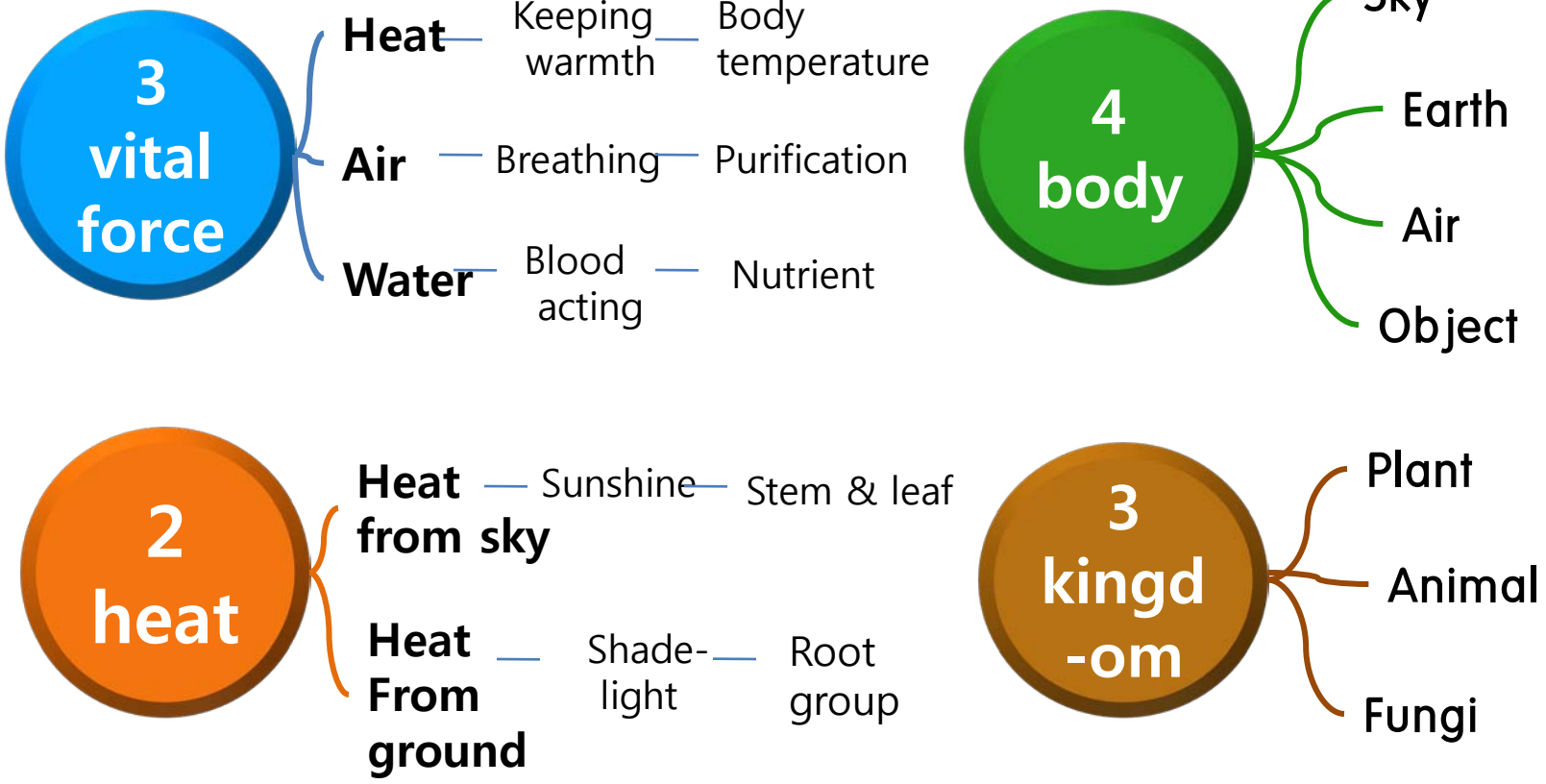
Science & Chemical



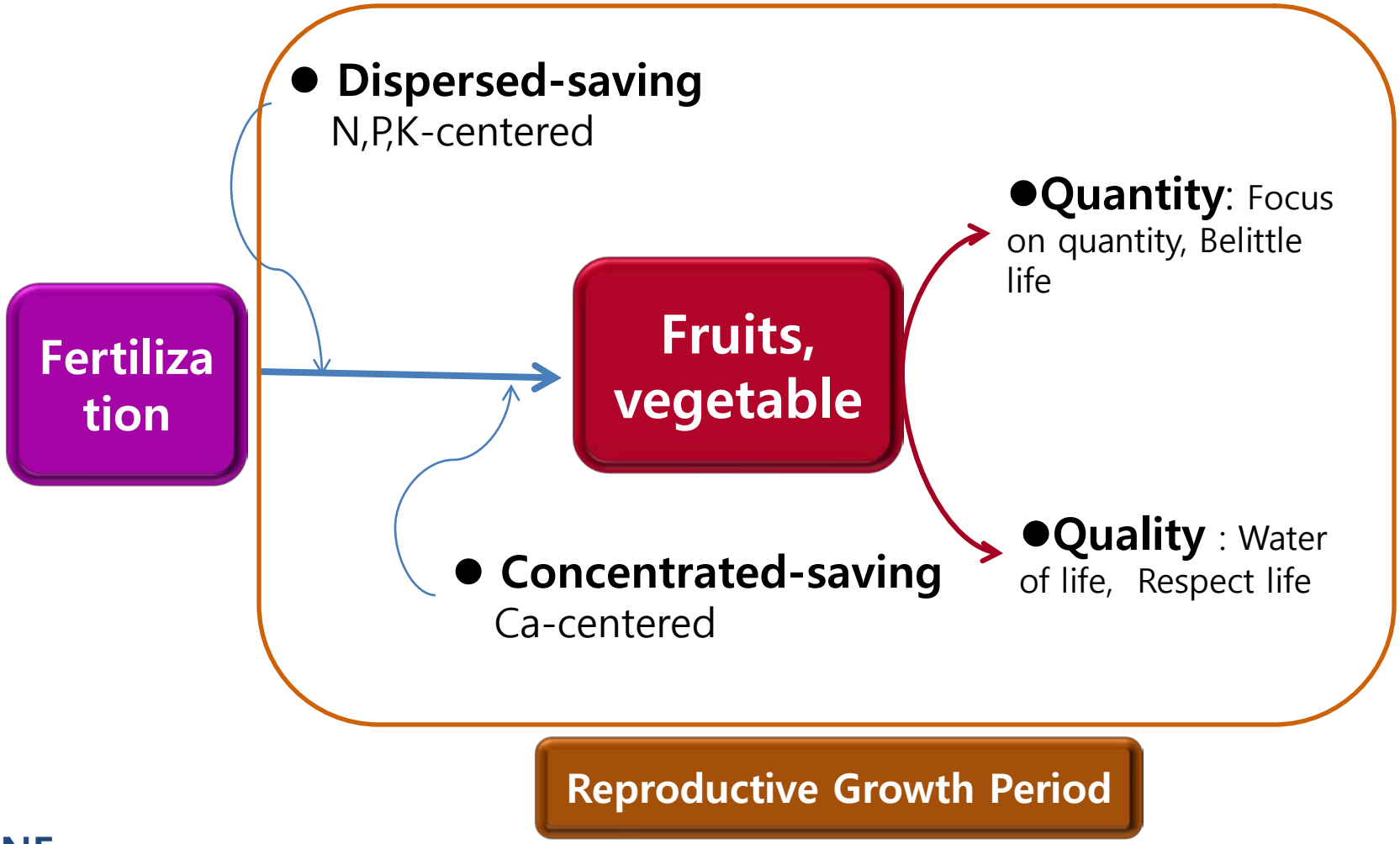
Science & Chemical



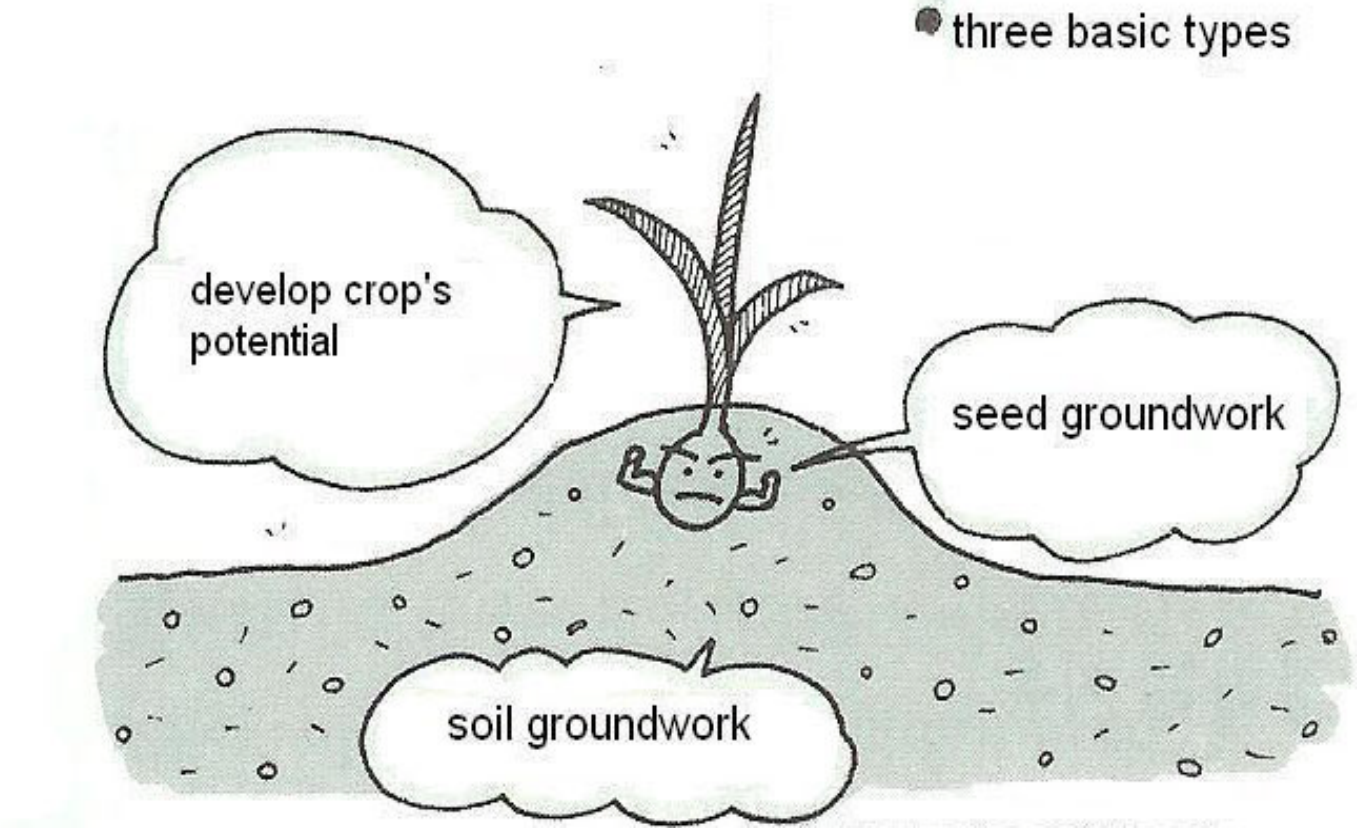
Science & Chemical



Natural Farming's basic idea



Natural Farming-Three types of groundwork



Natural Farming-Three types of groundwork

❖Soil groundwork

- No-tilling
- Using rice straw and fallen leaves for mulching
- Using IMO#4 for rebuilding microorganism balance in the soil

Symviosis of grass and fruit tree

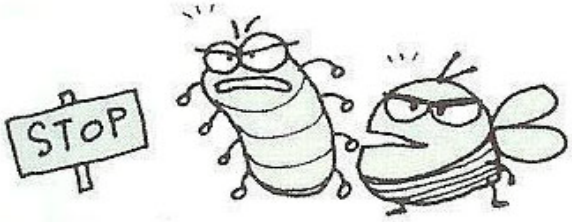
Grass cultivation

- Roots stretches more deeply.
- Microorganisms go into soil deeply so that self-cultivation can be occurred.
- Insect lives in grass and do not climb to the tree because tree is taller than grass

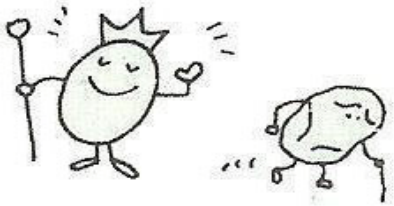
- Leguminous bacteria provides nitrogen.
- Then rice and plants are grow well.
- Other grasses can not grow well.

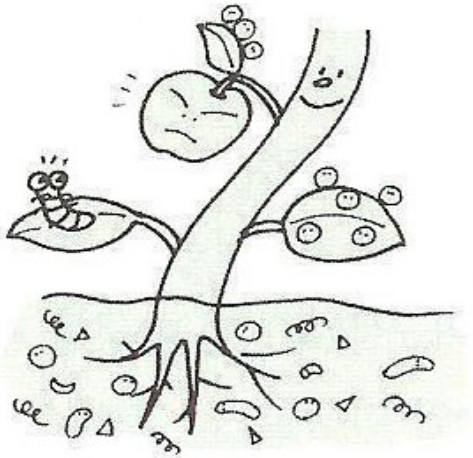
- It will be the soil that microorganisms can easily propagate.
- It prevents evaporation of moisture.
- In fall, spraying mixed fermented gertilizer (with soil, amino acid, Fermented fruit juice) as a doughnut and covering rice straw and grass.

- There is no harmful insect



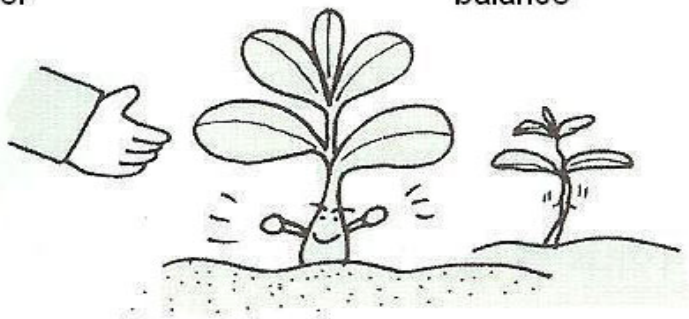
- There is no 'good virus'



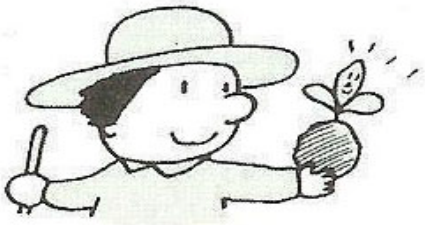


- Each of the microorganisms exercise their power

Perform their roles well, they keep the balance



- The only thing we can do is 'rediscovery' and 'making environment'



Grass cultivation-Rye

1

2

3

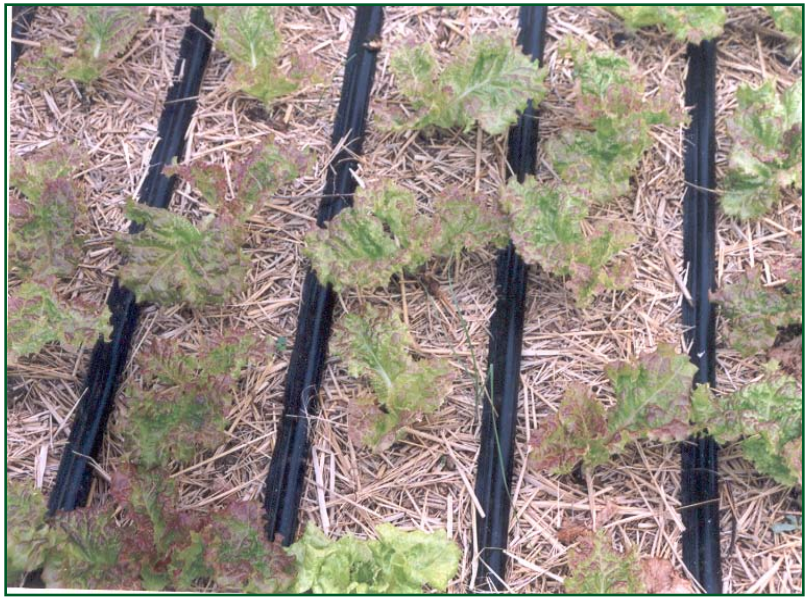
4

5

6

Mulching

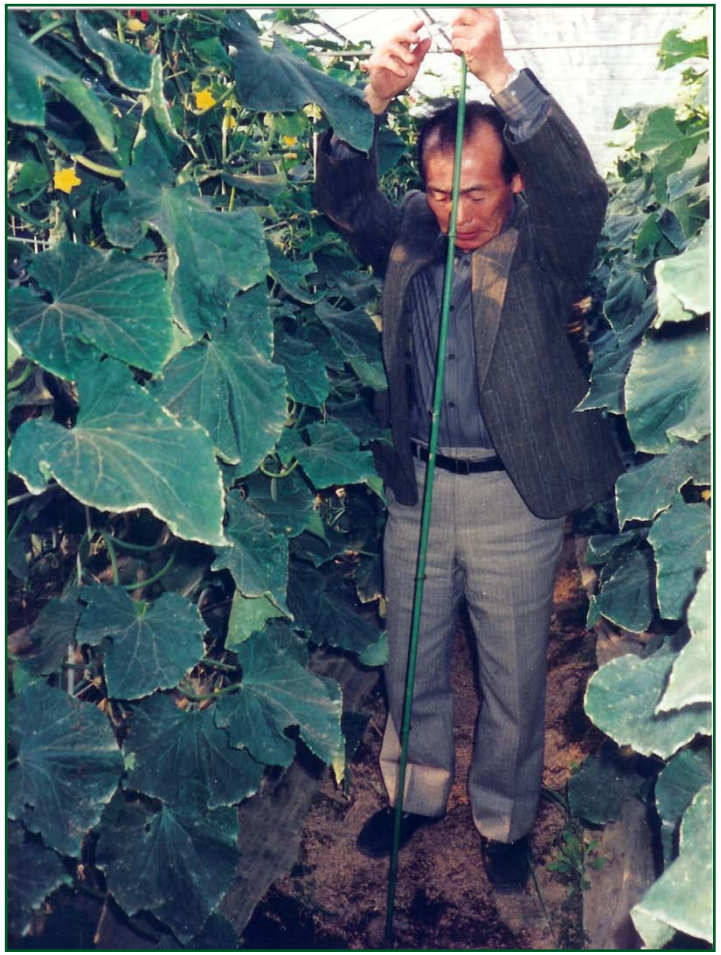
Leaf mold mulching



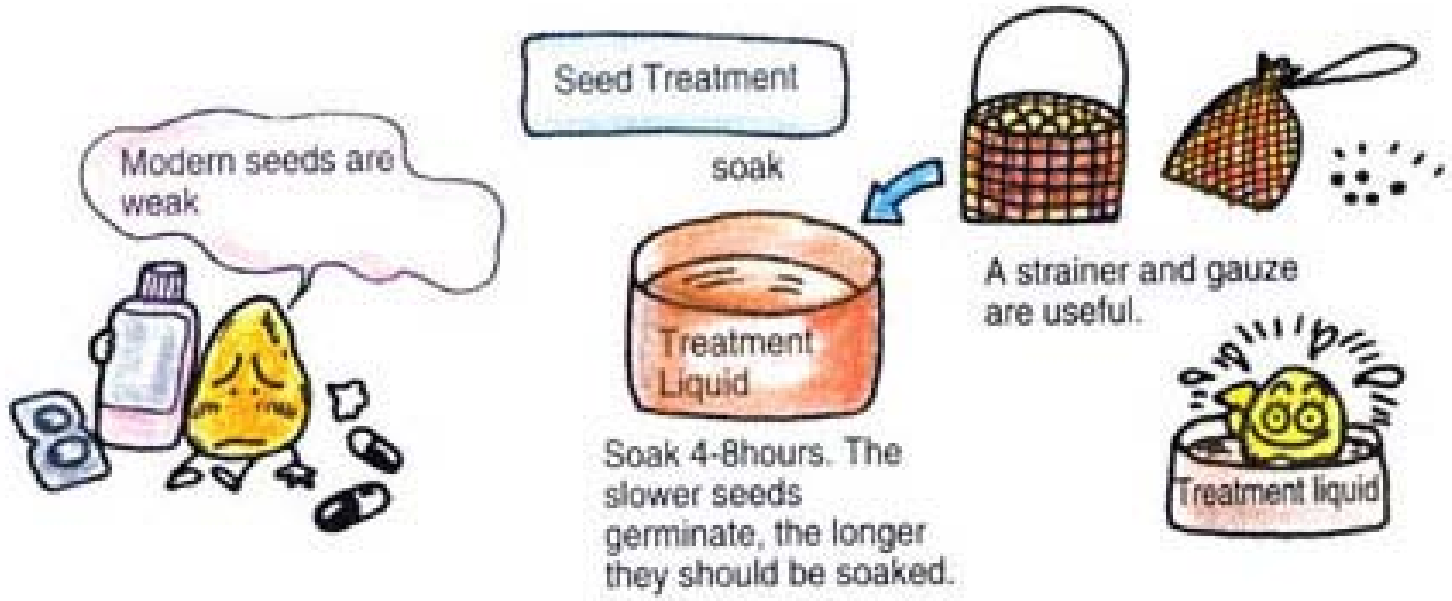
Rice straw mulching

Changing of soil structure: Aggregate structure

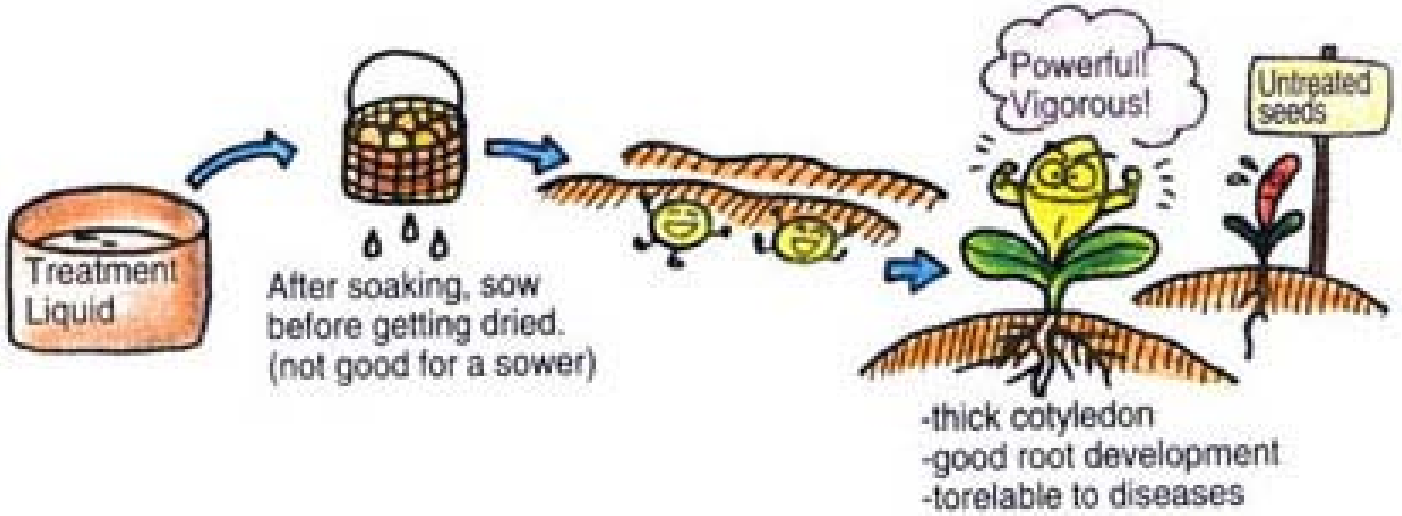
Changing of soil structure: Breaking hard -soil



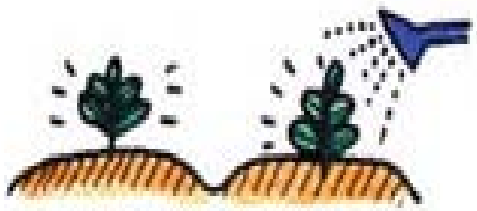
Seed groundwork



Seeding


Treatment Liquid
After soaking, sow before getting dried. (not good for a sower)
Powerful! Vigorous!
Untreated seeds
-thick cotyledon
-good root development
-torelable to diseases

Seedling groundwork



Apply the treatment liquid after transplanting

『Nutritional cycle』 of Natural Farming

- 『Nutritional cycle』theory tries to raise the nutritional and physiological condition required for each growth stage to the most proper state through the diagnosis and correct study of the growth.

Reference："新材盃技術の理論体系", 大井上康

Gross Greville –Rhythm of Nutrient type

Nutrient Types

	Characteristics	N	C	moisture	C/N
Type Ⅰ	So rich in moisture and nitrate that it refuses nutrient growth and reproductive growth. Lack in C and has low nutrient growth and no flower budding.	Much	little	Much	low
Type Ⅱ	Rich in moisture and nitrate and has enough C. Active nutrient growth but has poor budding, leading to flowers that are not fruitful.	average	Average–Small side	Average–large side	High–medium
Type Ⅱ	Rich in moisture and nitrate. Less C than Ⅱ, but active flower budding and has good yields.	little	Much	little	High–medium
Type Ⅱ	Less moisture and nitrate and has small nutrient frowth. Noflowers or fruits.	little	Much	little	high

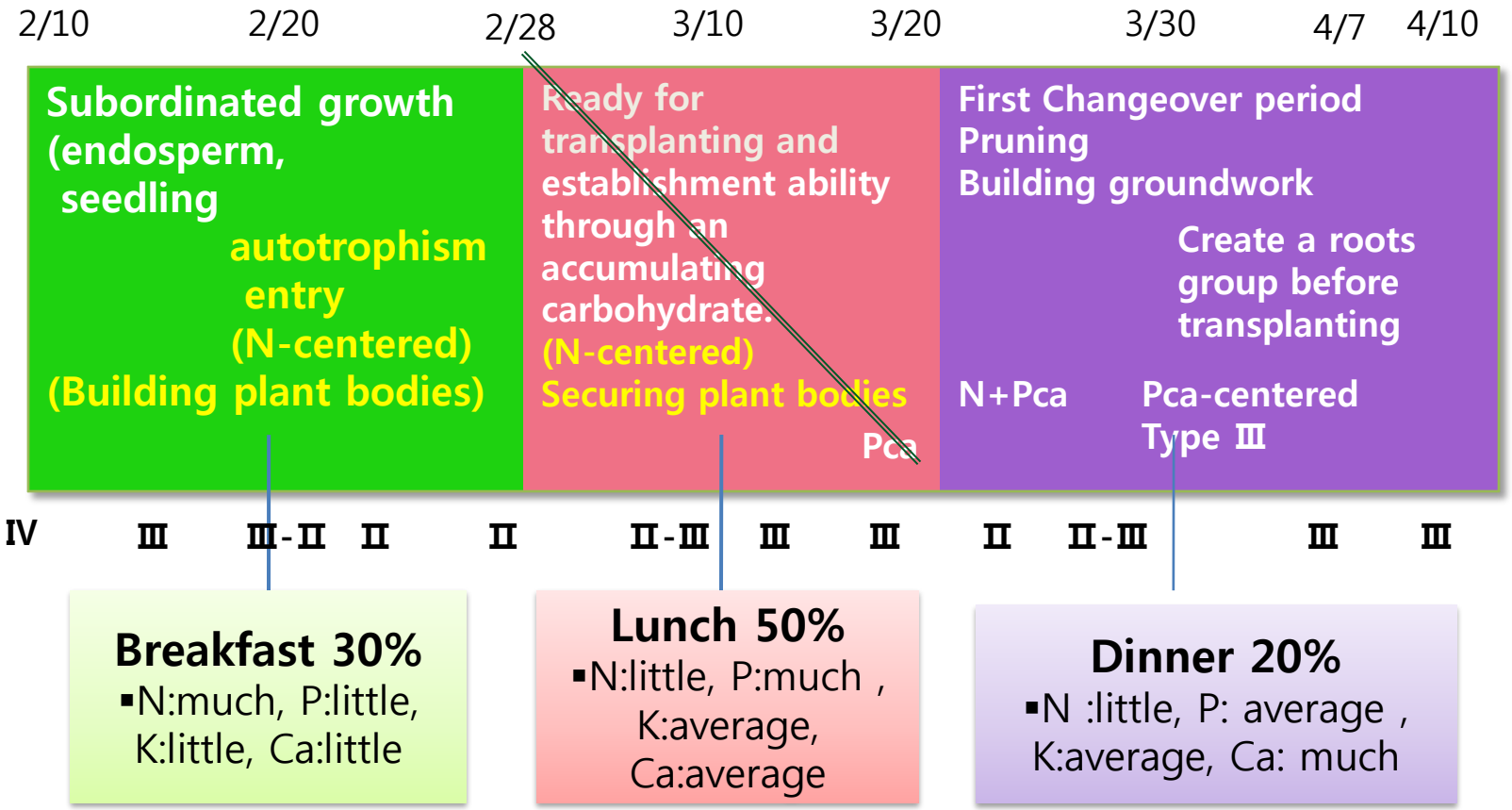
Nutritional cycle of Crop

Nutritional Growth Period (Consumption growth, Basic vegetative growth)	Changeover Period (Preservation growth, Floral differentiation)	Reproductive Growth Period (Accumulated growth, Growth period)
▪Stage beginning from the happening of new organs (organizations and organs) and ending to their maturity. ▪Consuming stage (consumption growth) of carbohydrate (C) turning to organic nitrogen(N) by inorganic nitrogen(n). ▪N:much, P:little, K:little, Ca:little	▪The time between the nutritional and the reproductive growth is called the『Changeover period』 ▪N:little, P:much , K:average, Ca:average	▪Process from the arising flower to maturing nuts and fruits ▪Not consuming carbohydrate by inorganic nitrogen, but stores carbohydrate in nuts and fruits and other storage organs ▪ N :little, P: average , K:average, Ca: much

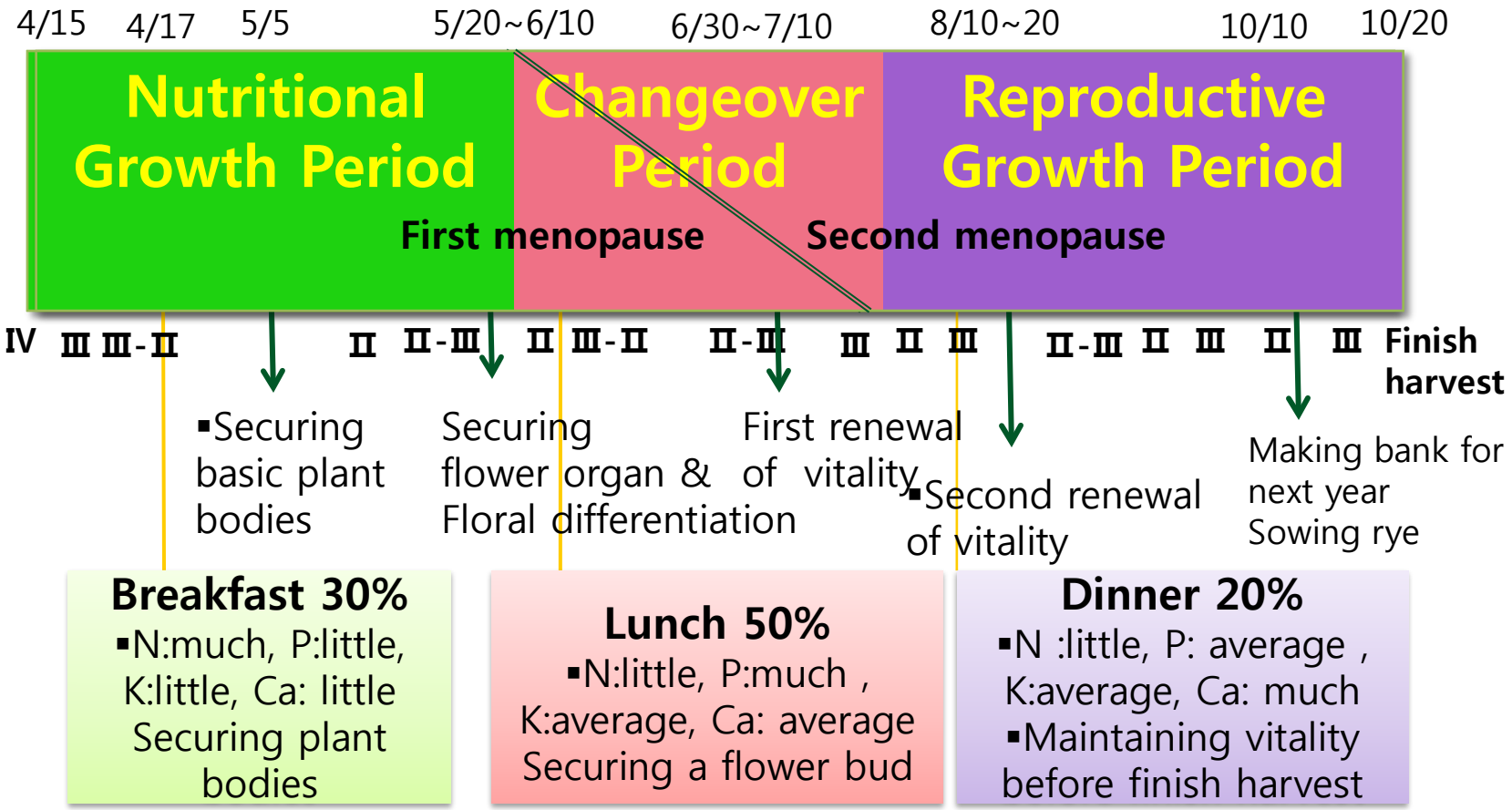
The changeover period treatment responds to "morning sickness" of plants.

Changeover Period-Floral differentiation

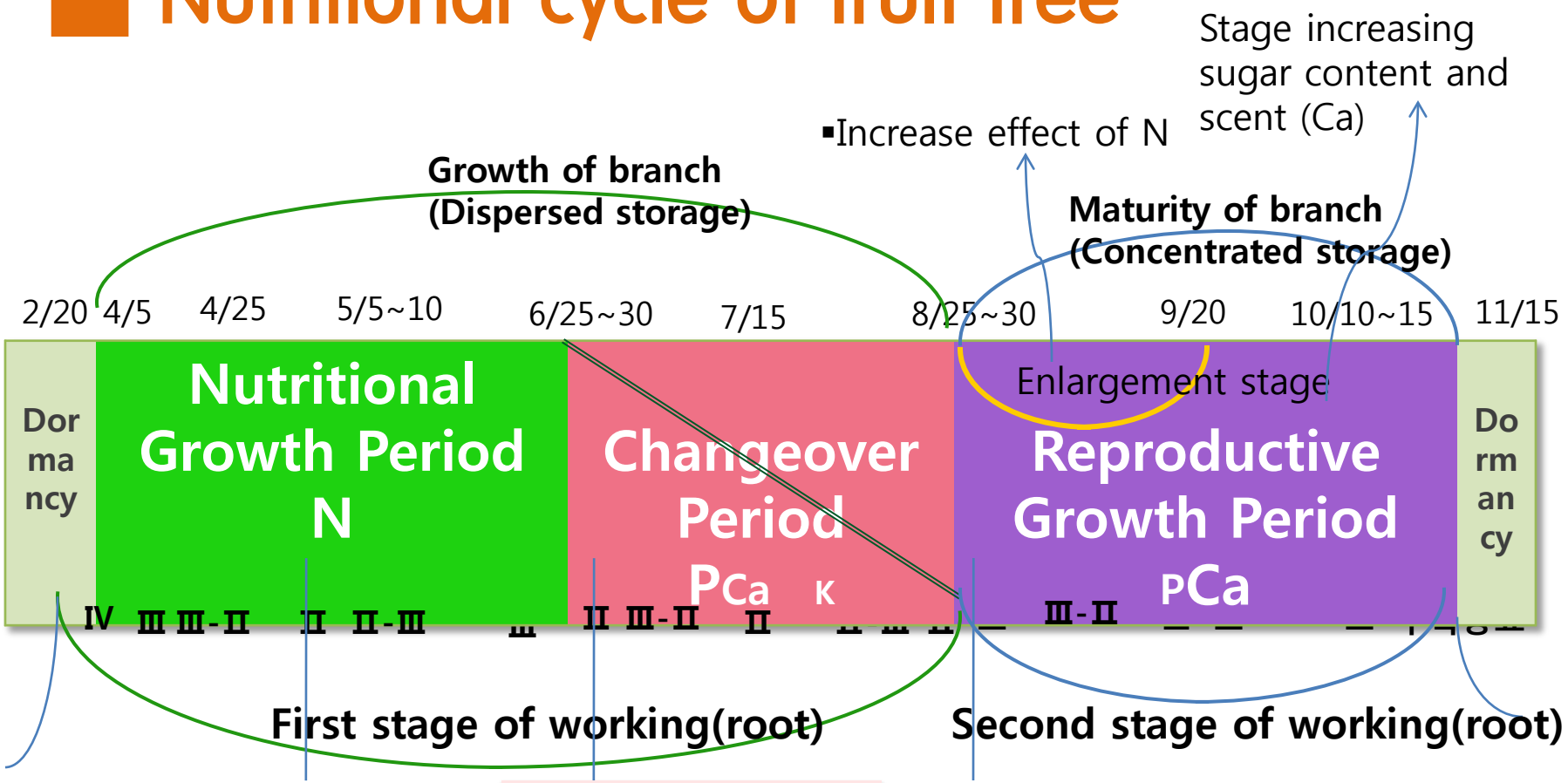
Nutritional cycle of raising seedling of fruit &vegetables (60 days- raising seedling)



Nutritional cycle –From planting to harvesting



Nutritional cycle of fruit tree



Breakfast 30%
▪N:much, P:little, K:little, Ca:little

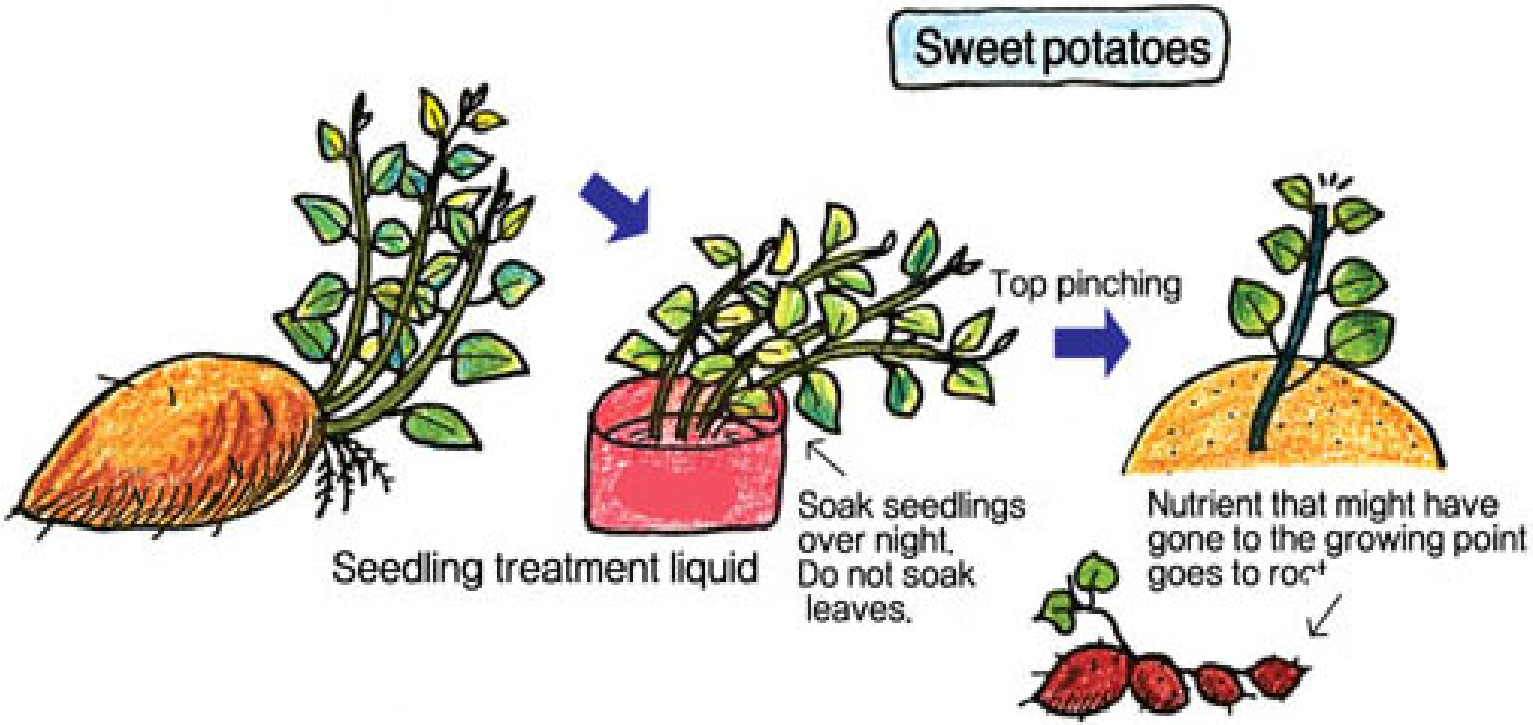
Lunch 50%
▪N:little, P:much , K:average, Ca:average

Dinner 20%
▪N :little, P: average , K:average, Ca: much

Agriculture materials for fertilization management

Soil groundwork	Seed and seedling groundwork	Type Ⅱ groundwork	Changeover period groundwork	Type Ⅲ groundwork	Maturity groundwork
Grass cultivation	OHN	OHN	OHN	OHN	OHN
Charcoal-house of microorganim	BRV	BRV	BRV	BRV	WCA
IMO#4	FPJ(mugwort, dropwort, etc.)	FPJ(mugwort, dropwort,etc.)	FPJ('Child liquid' , Flower of the false acacia , etc.)	FPJ(Flower of the false acacia , FFJ , etc.)	Sea water
OHN	(FAA)	FAA	(FAA)	(FAA)	M-E
BRV	WCP	(WCP)	WCP	WCP	
FPJ(mugwort,dropwort, etc.)	malt	LAB	WCA	WCA	
Malt	Yeast	M-C	LAB	Fermented sea water	
Sea water	M-A	(Soap water 3)	M-D	M-A	
M-A	(loess powder)		(Soap water 3)	(liquefied IMO#4)	
				(Soap water 3)	

Natural Farming
-Technique for increasing yield



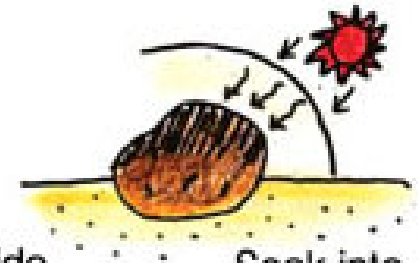
Natural Farming
-Technique for increasing yield

Potatoes

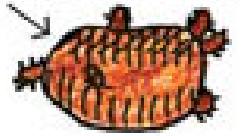
(Sunlight treatment)

Potatoes contaminated with virus will go rotten
Slighly Contaminated ones will get well

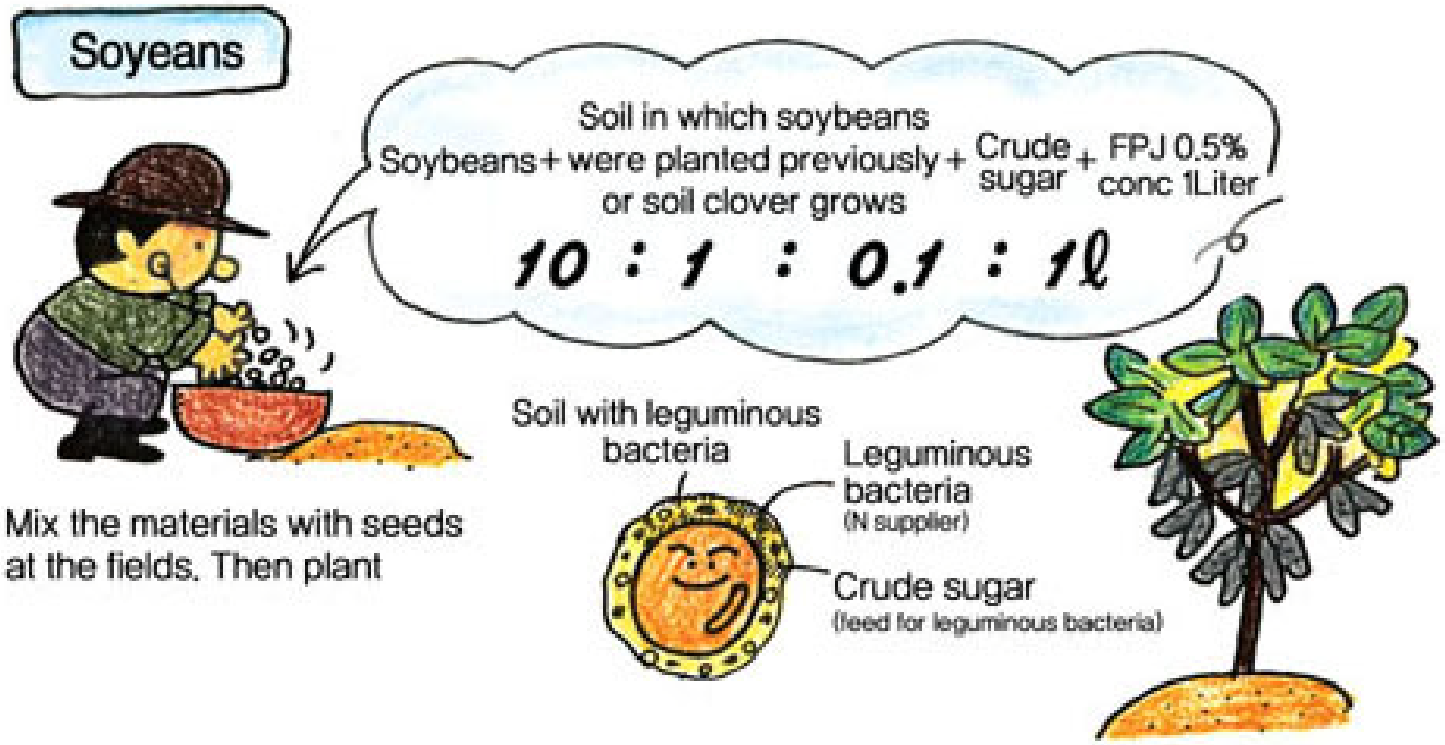
- Make a tunnel on sandy soil.
- Bury half for a week two weeks before planting
- Turn over to have the opposite side get sunlight
- Potatoes become green
- Cut with a bud and plant



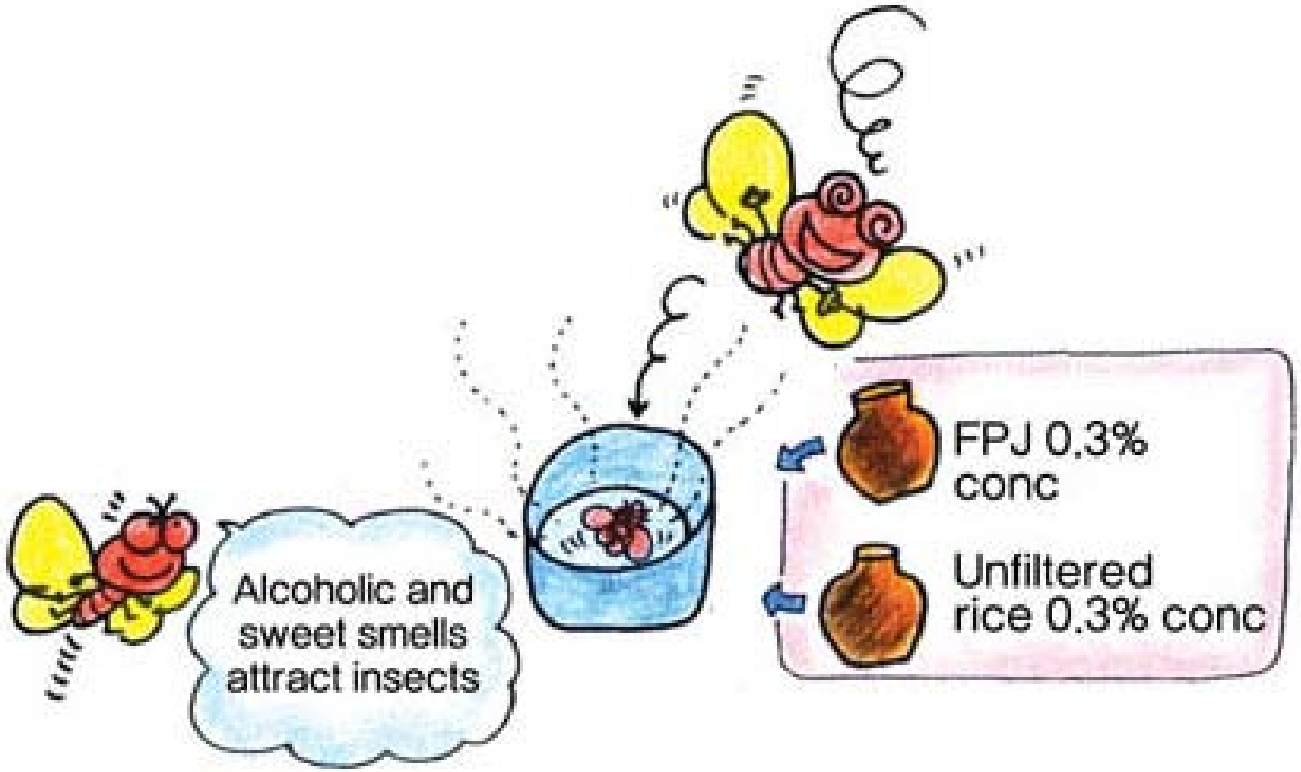
Soak into treatment liquid



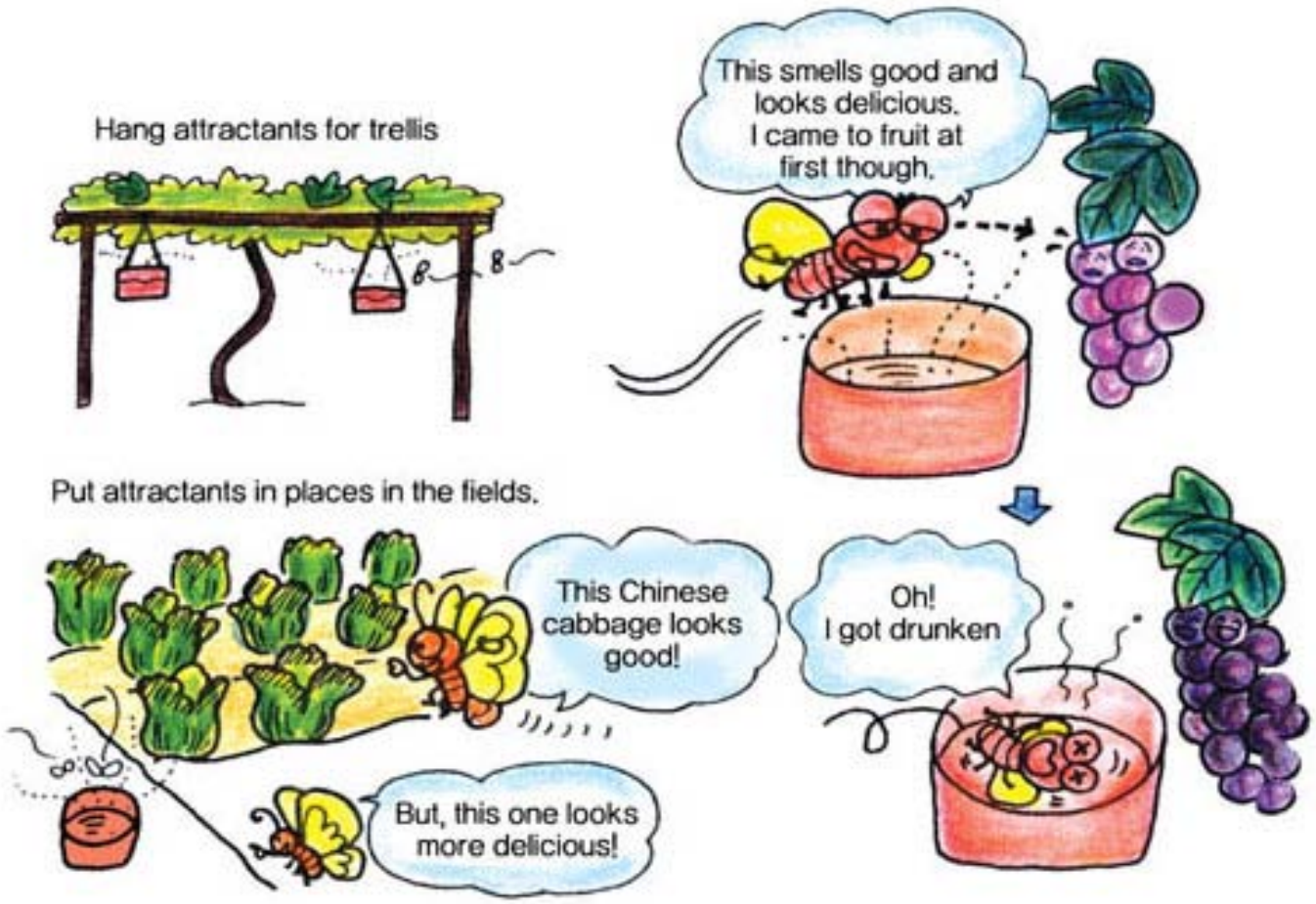
Natural Farming
-Technique for increasing yield



Natural Farming- Insects attractant



Natural Farming- Insects attractant



Natural Farming-Type II

Natural Farming Changeover period groundwork

❖Chilli (Pepper)

Natural Farming Changeover period groundwork

❖Tomato

❖Pepper

❖cucumber

Natural Farming Changeover period groundwork

❖Broccoli

Natural Farming-Maturity groundwork

Natural Farming-
Fertilization management by nutritional cycle

Natural Farming-Disease management

root knot nematodea

Seedling groundwork treatment

Healthy harvest

Natural Farming
-Obstacle by continuous cropping

Natural Farming
-Obstacle by continuous cropping

Comparing between growth of Natural Farming and Conventional practices farming

Thai National University of Agriculture and Fisheries

Natural Farming

General Agriculture

Natural Farming

General Agriculture

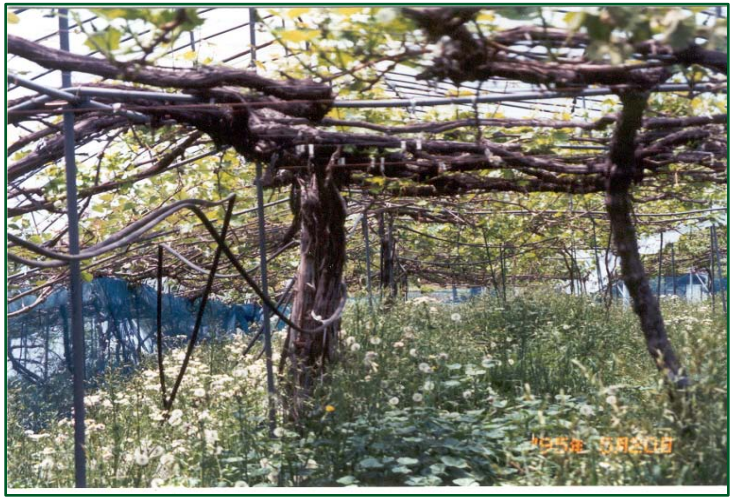
Comparing between growth of Natural Farming and Conventional practices farming

4 years : General Agriculture

11 years : Natural Farming

Natural Farming

-Fertilization management



Grass cultivation-Rye

False grass cultivation

Grass cultivation-others

Natural Farming-Farm products

❖ cauliflower

❖ broccoli

Natural Farming-Farm products

Natural Farming-Farm products

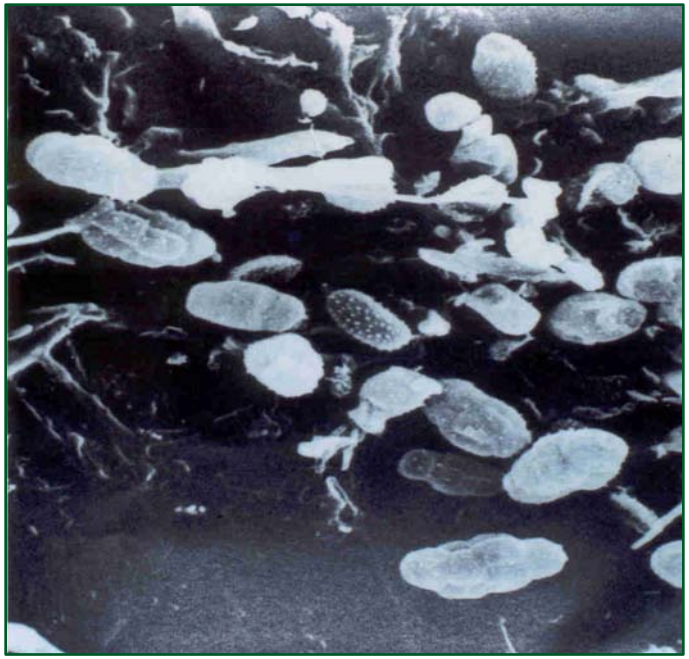
Natural Farming-Farm products

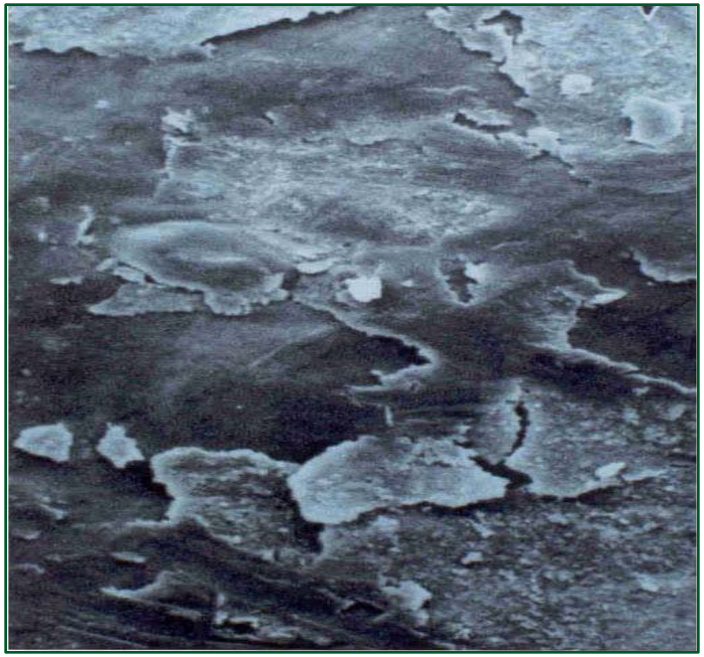
Management of the late harvest stage

Growth and development management

Microbes of healthy leaf

Microbes of diseased leaf





Chemical matters destroy microorganism in the leaf that result in decreasing photosynthesis and resistance

Nature

Vitality- Trees grew on the rock for itself and broke the rock

THANK YOU

Cho Global Natural Farming(CGNF)