

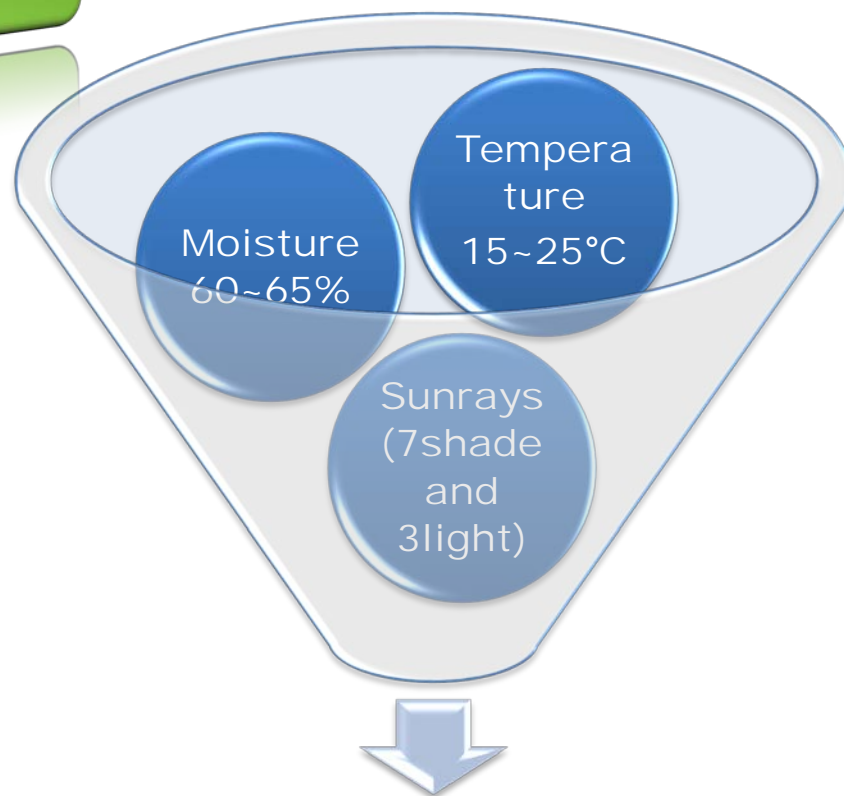
Natural Farming

The Microorganism

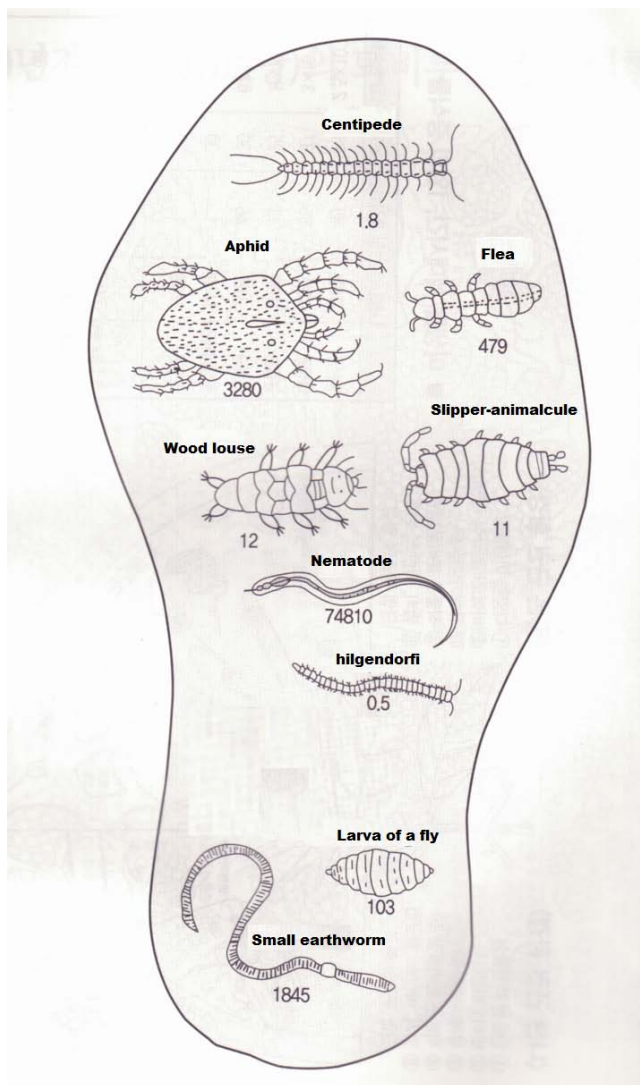


Cho Global Natural Farming(CGNF)

**Best condition for
microorganism**



Microorganism



Source: The basic knowledge of soil microorganism (Japan)

Soil and Microorganism – in 20cm topsoil

How many microorganisms in the soil?

There are 700Kg microorganisms per 0.1ha.
(It depends on content of organic matter)

Mold 70~75%, germ 20~25%,
small animal 5%.

Their body is made up of **80% moisture**.

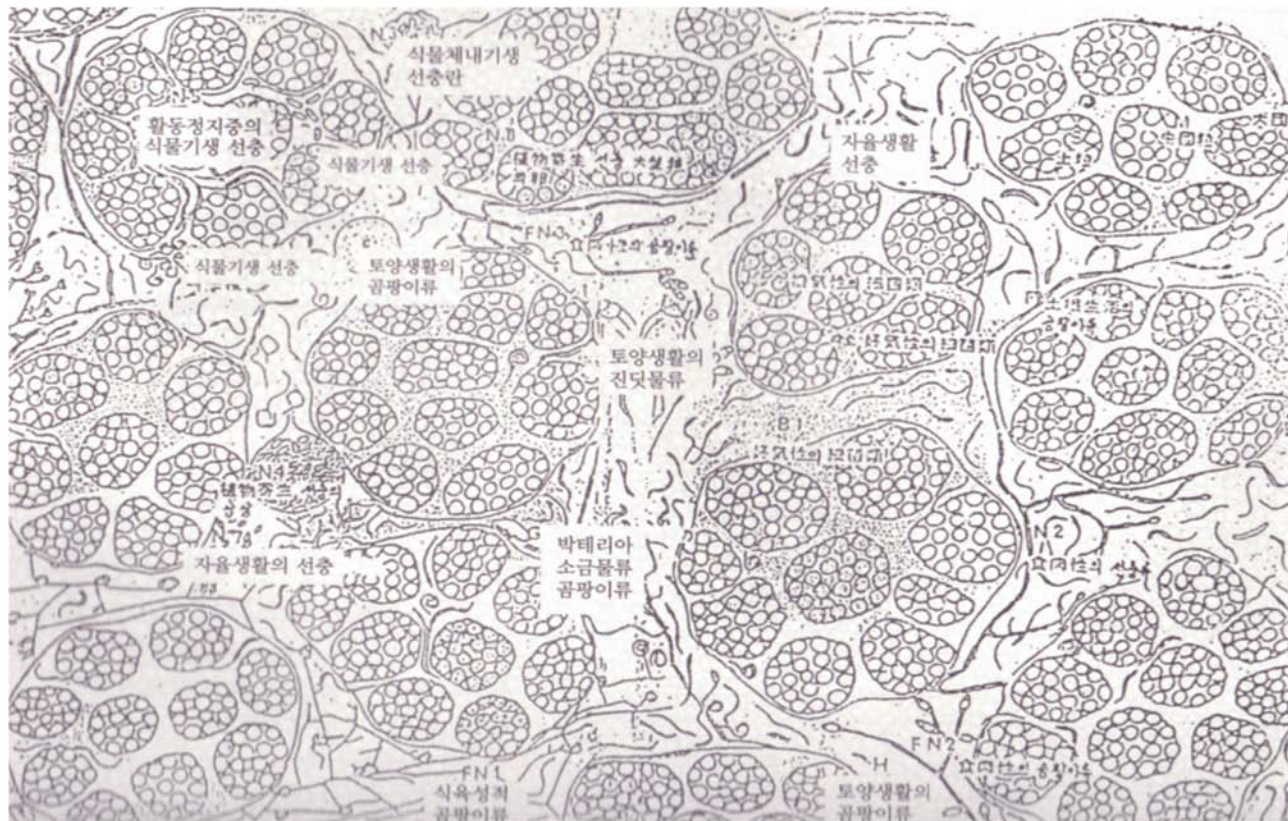
Carbon 70kg, Nitrogen 11kg

Nitrogen application amount on normal crops are same as Fungus' Nitrogen.

Field that put compost (1.2ton) for 40 years



Single grain
structure

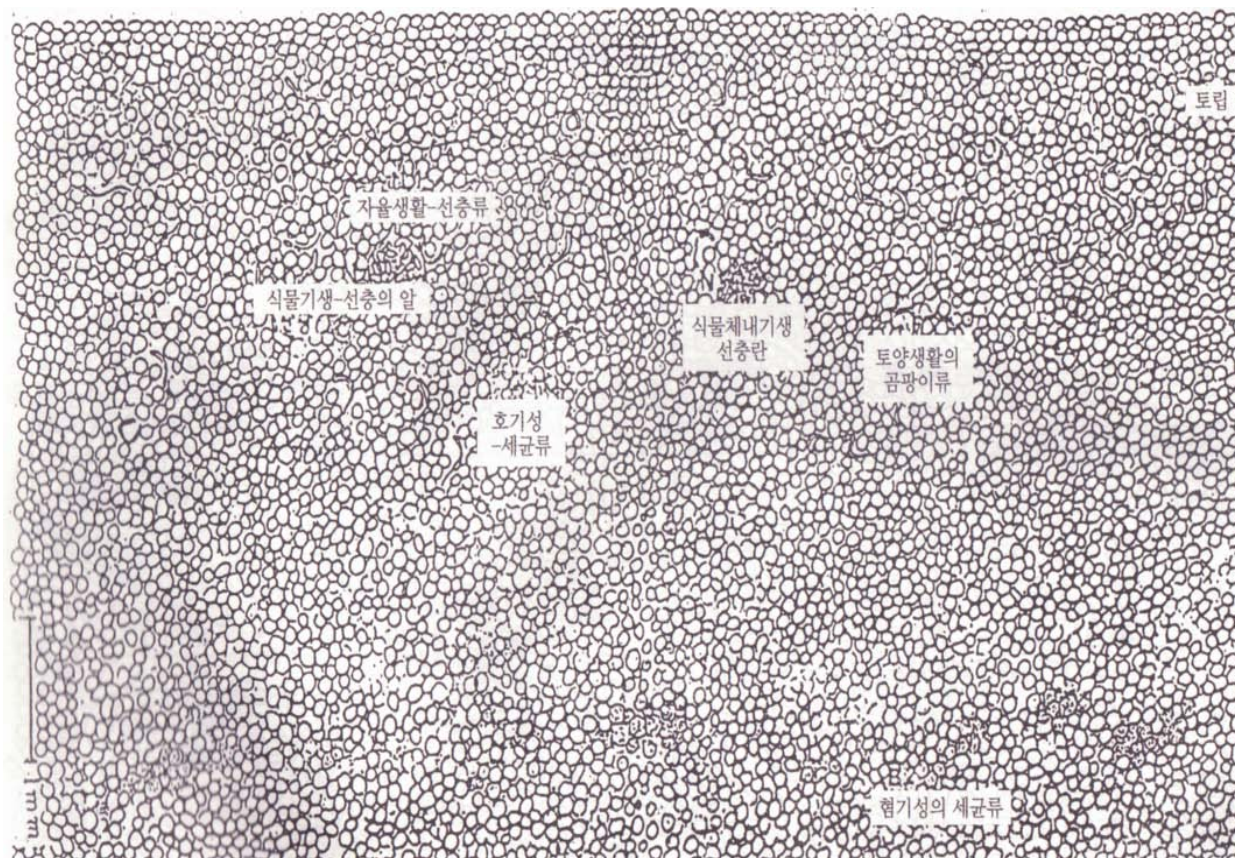


Source: Research of Adaptability of Vegetable and Plant (Japan)

Field that put compost (1.2ton) for 40 years



Aggregate structure



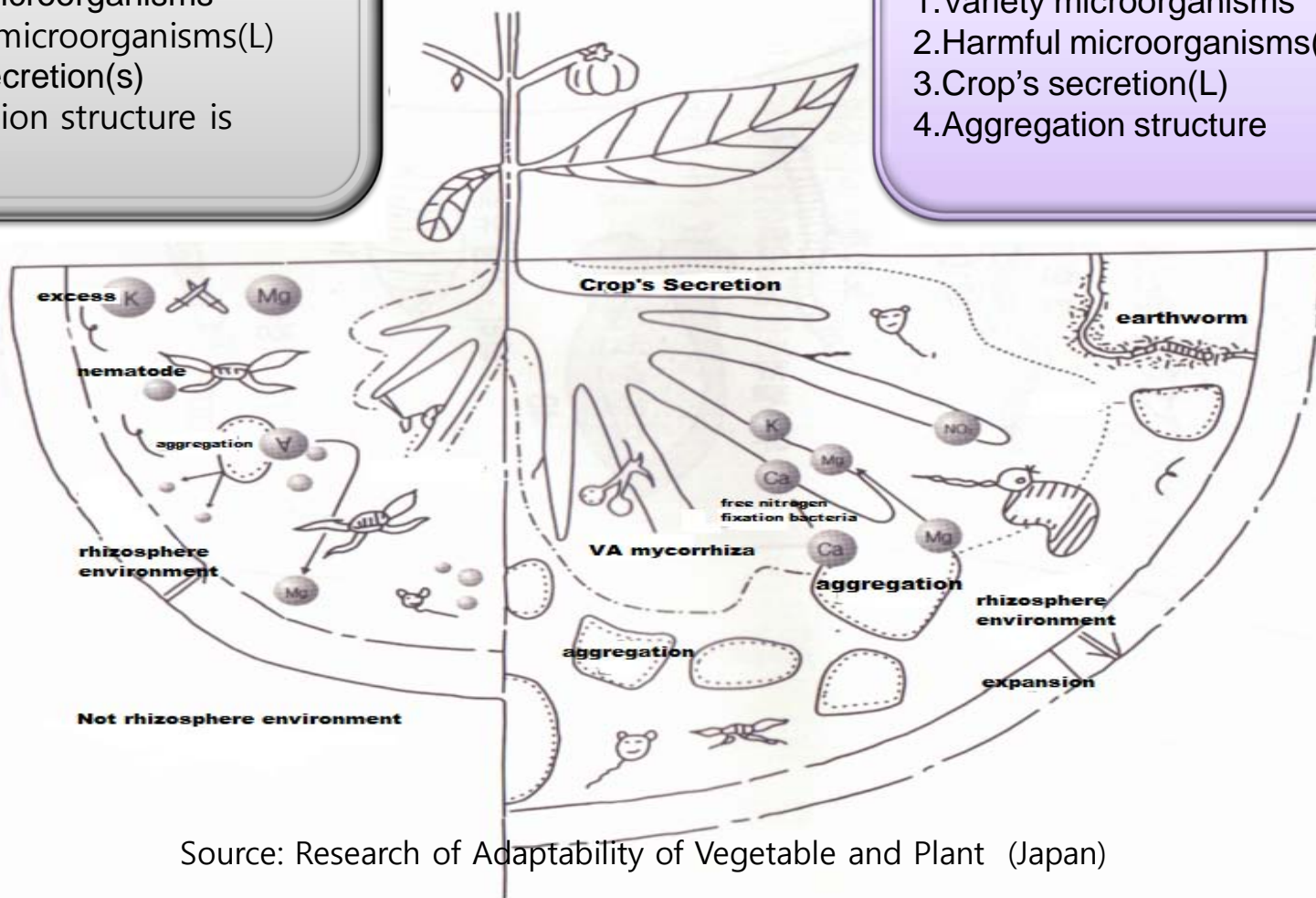
Source: Research of Adaptability of Vegetable and Plant (Japan)

Bad rhizosphere environment

- 1.Simple microorganisms
- 2.Harmful microorganisms(L)
- 3.Crop's secretion(s)
- 4.Aggregation structure is destroyed

Good rhizosphere environment

- 1.Variety microorganisms
- 2.Harmful microorganisms(s)
- 3.Crop's secretion(L)
- 4.Aggregation structure



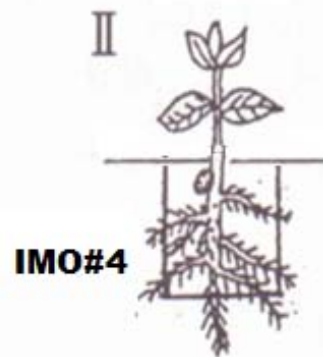
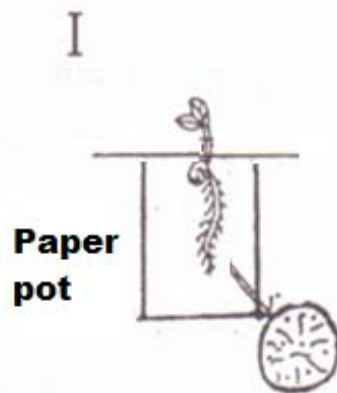
Source: Research of Adaptability of Vegetable and Plant (Japan)

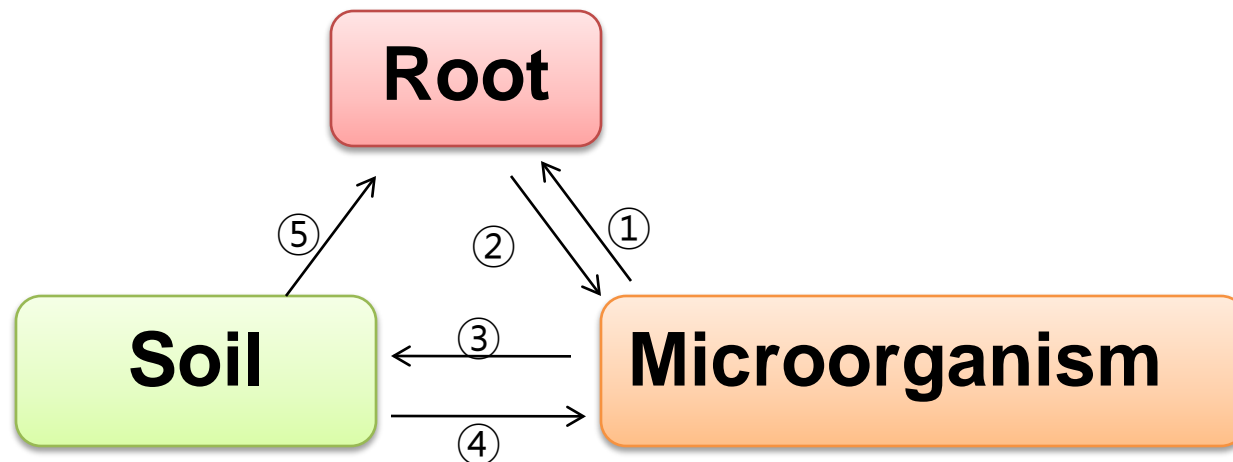
Microorganism's proliferation times

	Minute /1 generation	Proliferation times/1day	Temperature	Proliferation /1day
Lactic acid bacteria	38min	38	25	2.5×10^{11}
coliform bacillus	18min	85	37	3×10^{23}
Free nitrogen fixation bacteria	110min	13	25	8×10^3
hay bacillus	31min	46	30	6×10^{13}
photosynthetic bacteria	144min	10	30	1×10^3
Yeast fungus	120min	12	30	4×10^3

Source: Research of Adaptability of Vegetable and Plant (Japan)

Rhizosphere- tropical application





- ① Free nitrogen fixation bacteria: Supply nitrogen
Mycorrhizal bacteria: Supply phosphoric
Supply organic nutrient by microorganism
Antagonism (against soil pathogenic bacteria)
- ② Plant secretes material that made by photosynthesis.
- ③ Decomposes organic matter and secretes vegetative nourishment.
- ④ Supply water, oxygen, nutrient, house
- ⑤ Supply inorganic fertilizer, oxygen, water, and maintain plant body

How wonderful root & It's Secretion !

A single crop

The number of root

1.Main root: 143

2.Lateral root:13million

(length: 327mile)

(surface area: 0.1mile)

3.Root hair: 10 billion

4.Secretion:30~40kg/0.1ha

5.Fertilizer: 20kg





Thank You



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