

Method of Soil Diagnosis



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IMPORTANCE OF SOIL DIAGNOSIS IN AGRICULTURE

Purpose 1

- Find out the soil-related factor inhibiting the growth of crops, and improve it.

Example →

Correct soil acidity

Correct phosphate deficiency

Improve drainage



Purpose 2

- Supply proper amount of nutrients necessary for the growth of crops, matching the nutrition status in soil.

Example →

Fertilizer application diagnosis





Purpose 3

Contribution to clean agriculture

← Excess fertilization pollute the environment

Nutrient absorption by plants

Nutrient holding capacity of soil

Present nutrient content in soil should be known.



Disorder in crop growth caused by nutrition status of soil

- Scab disease of potato
(too high soil pH)
- Infertility of rice ▪ Softening
(excess nitrogen, silicate deficiency)
- Bolting phenomena of vegetables
(excess phosphate)

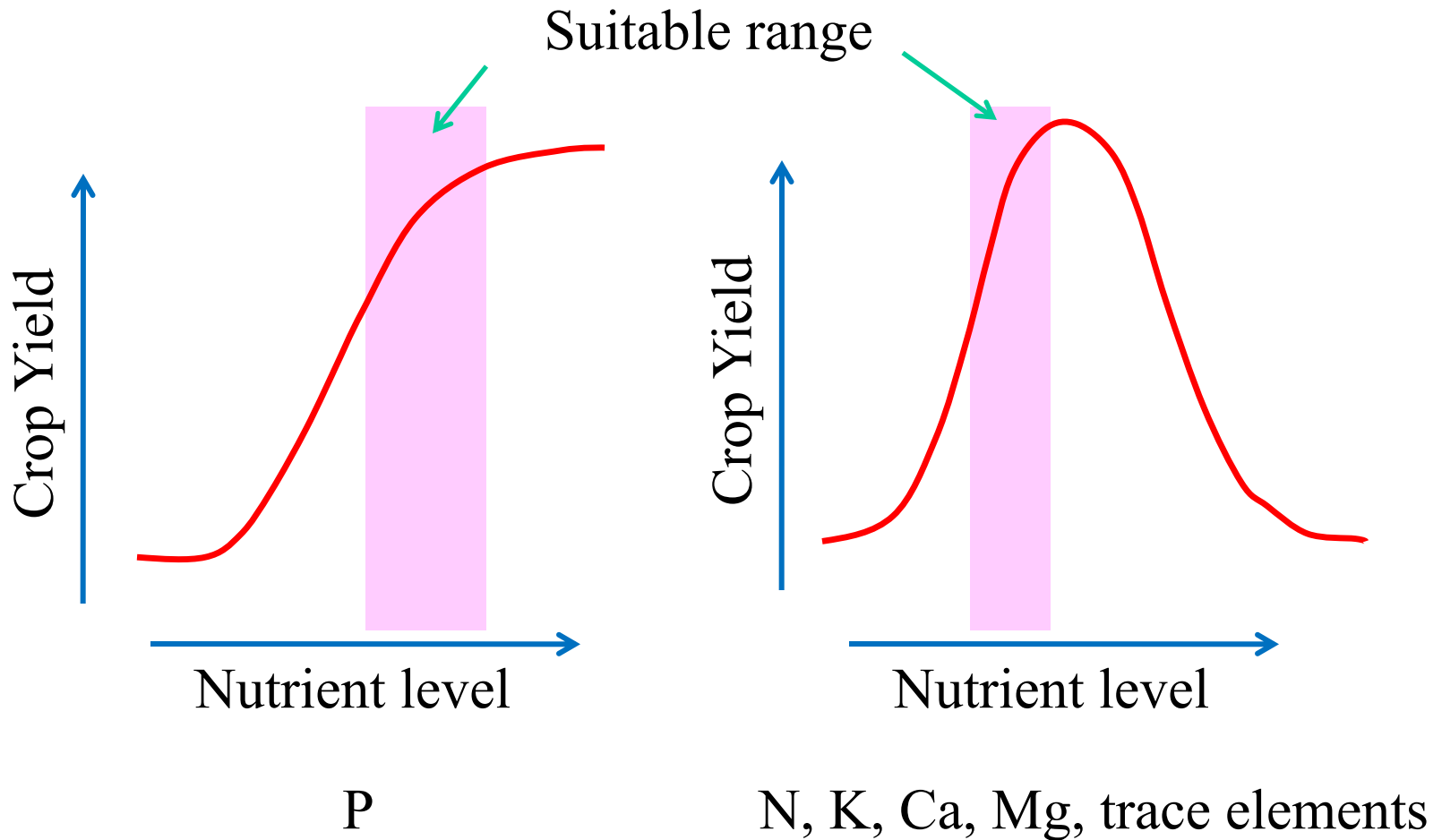


Disorder in crop growth caused by nutrition status of soil (2)

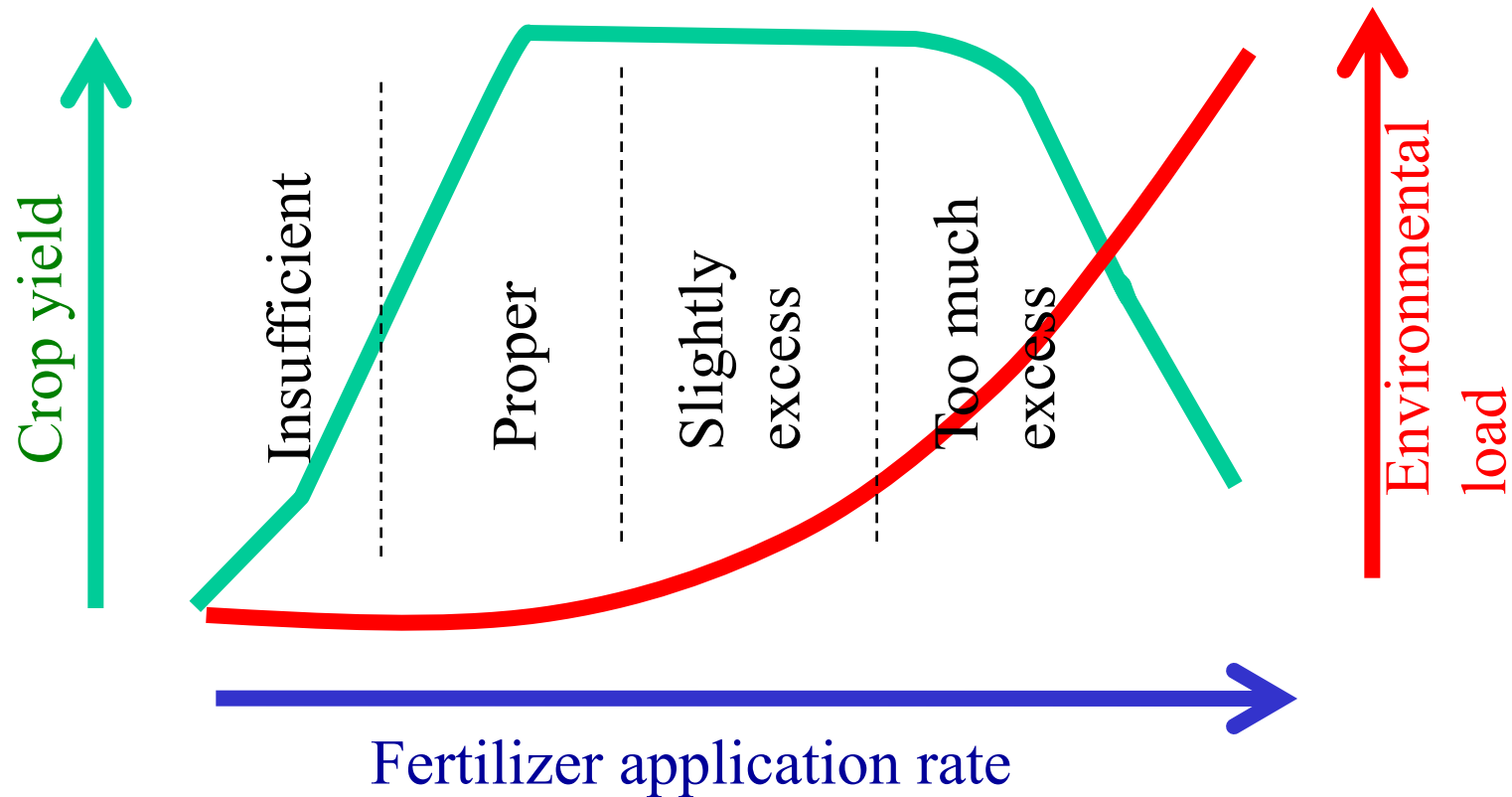
- Calcium deficiency of vegetables
(Imbalance in basic cations)
- Decrease in quality of vegetables
Lowering in sugar and vitamins
(accumulation of nitrate)



Crop yield and nutrient level



Crop yield and environmental load



How Soil Diagnosis is carried out in Japan

Method of soil sampling

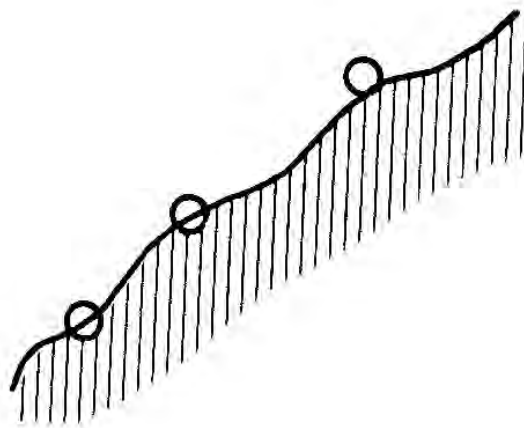
Case 1: flat and homogeneous field



Collect from 5 places
in a field

Method of soil sampling

Case 2: Slopes

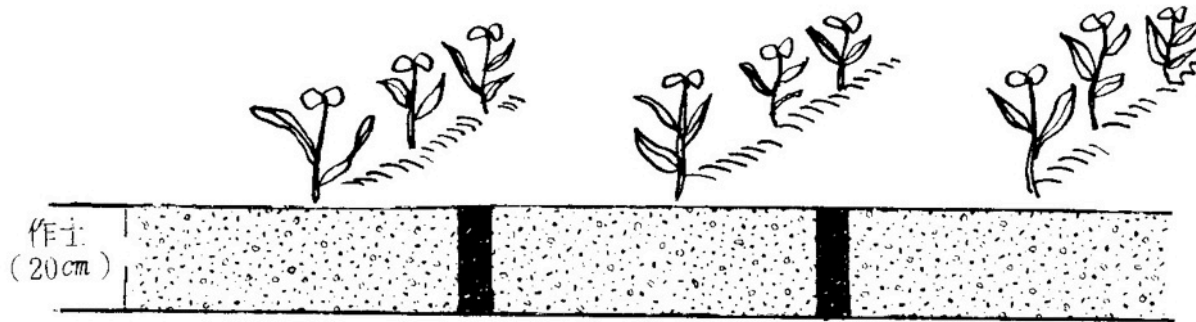


Separate into upper, middle, and lower portion. Collect 3 – 4 samples from each portion.

Method of soil sampling

Case 3: Flat furrow

○ 平 畦

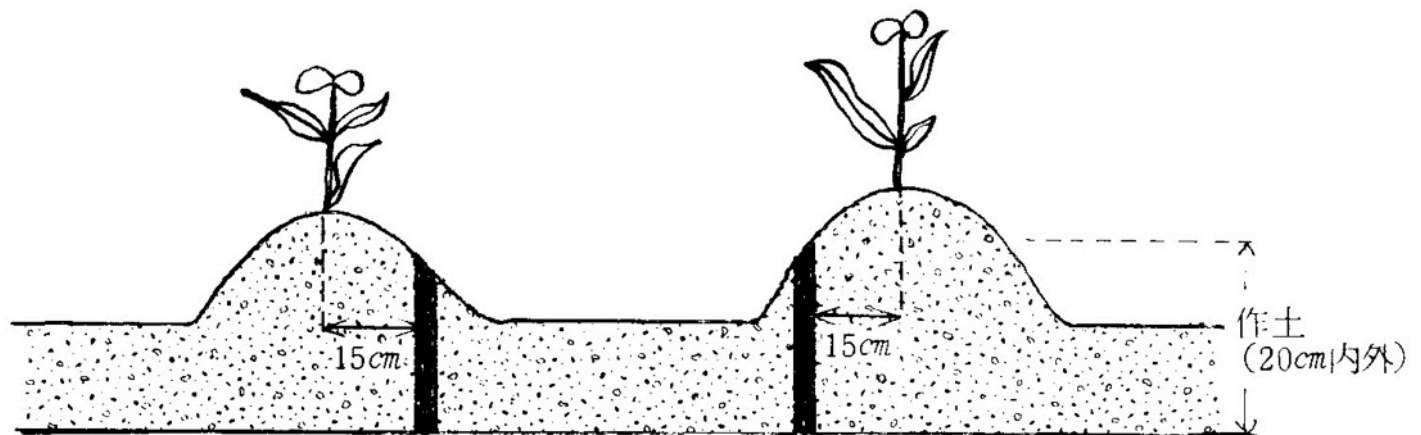


Central portion
between the row

Method of soil sampling

Case 4: High furrow

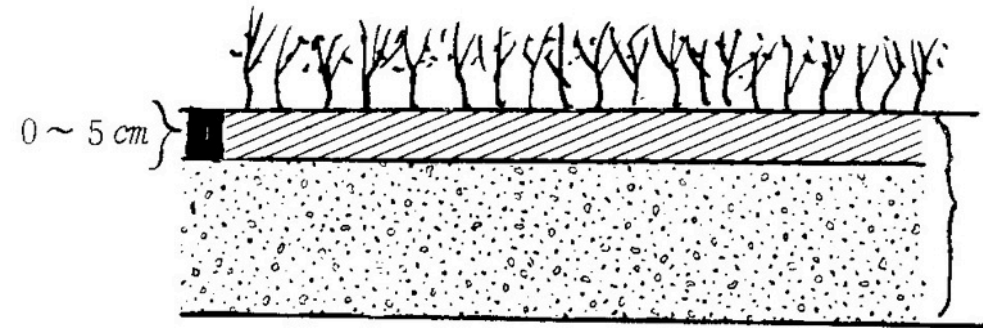
○ 高 畦



15 cm apart from the
center of the row

Method of soil sampling

Case 5: pasture grass field

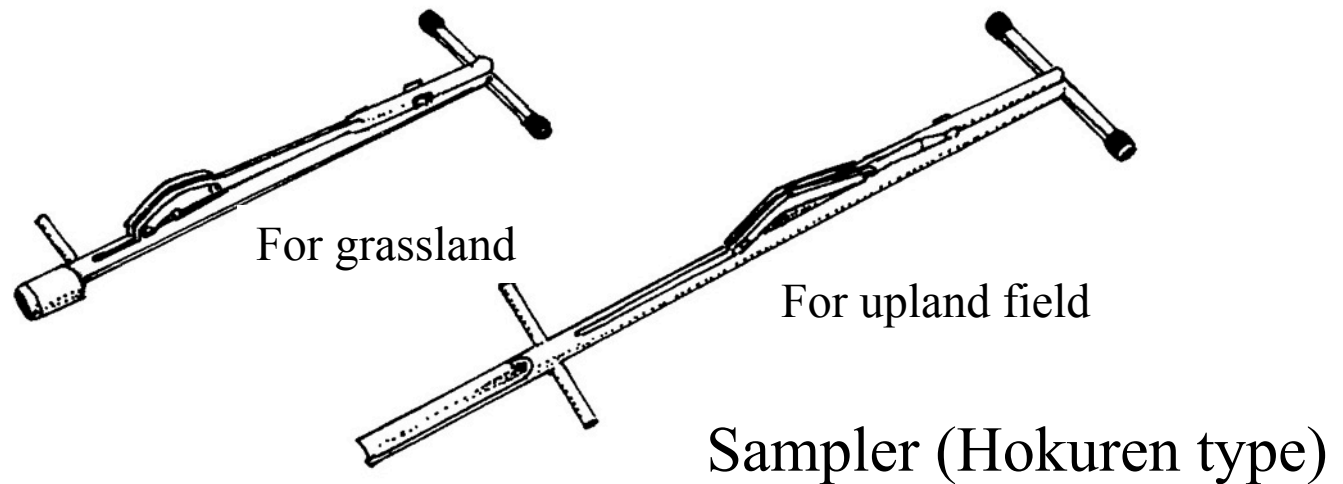


5 cm deep sample
from the root mat.
Refrain from mixing
the withered grass.

Method of soil sampling

Necessary Tools

1. Sampler (Hokuren type)
2. Analysis order sheet
3. Plastic bags
4. Plastic bucket
5. Rubber band
6. Felt pen
7. Memopad with a ballpoint pen
8. others

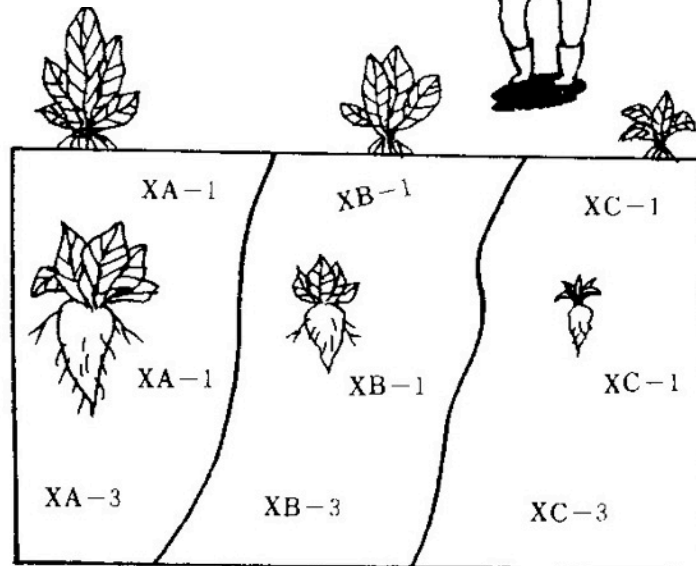


Attention 1

in soil sample collection

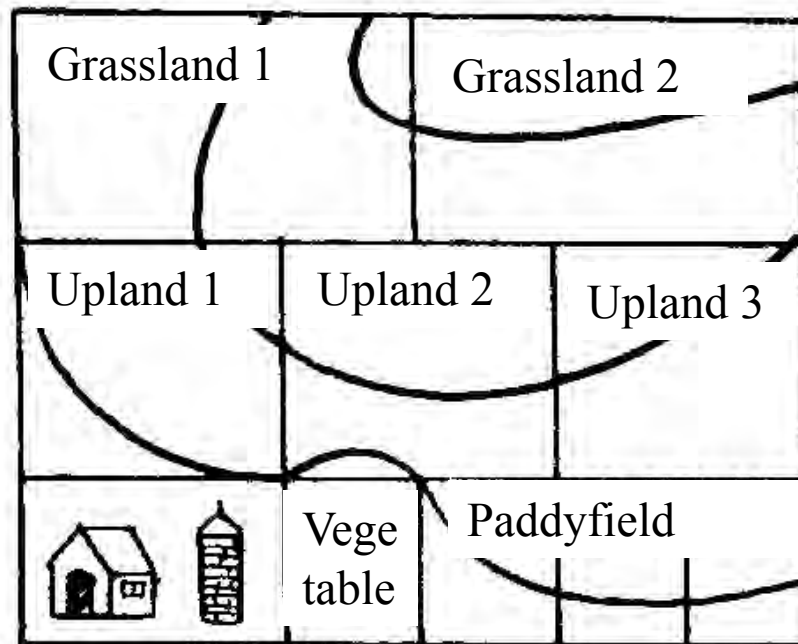
Growth status of crops

Why ? With
same seed and
same fertilizer!

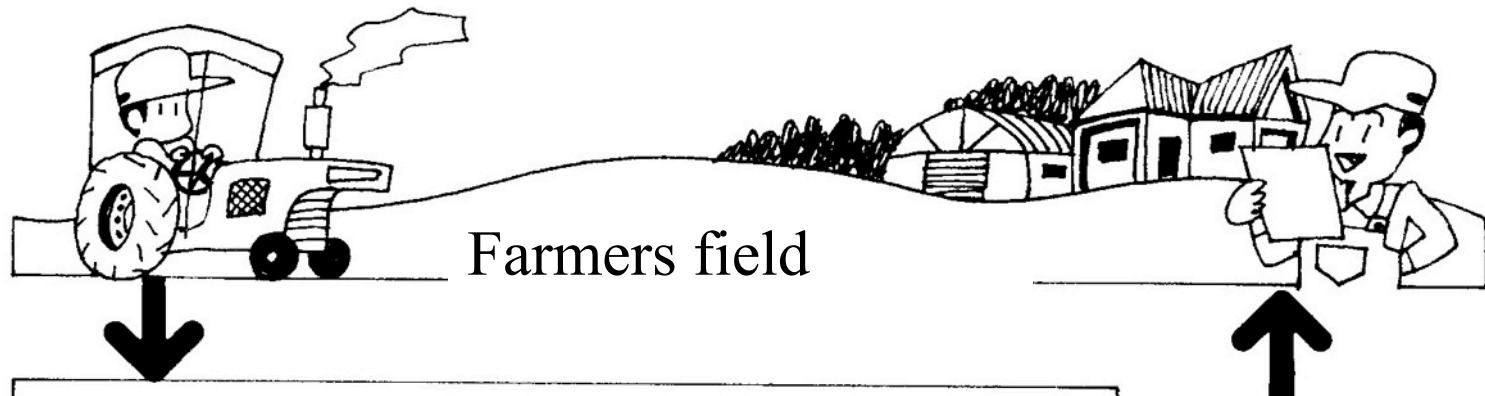


Attention 2 in soil sample collection

Field division

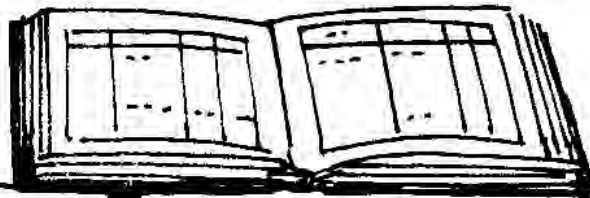


Flow sheet of soil diagnosis 1



Flow sheet of soil diagnosis 2

1. Refer to record book



1. Field division
2. History of Land improvement, soil improvement
3. Recent record of growth, yield, quality
4. Fertilizer management

Mr. Hosono explains his farm managements



Scene of Soil Diagnosis Practice (JICA Soil Diagnosis Course)



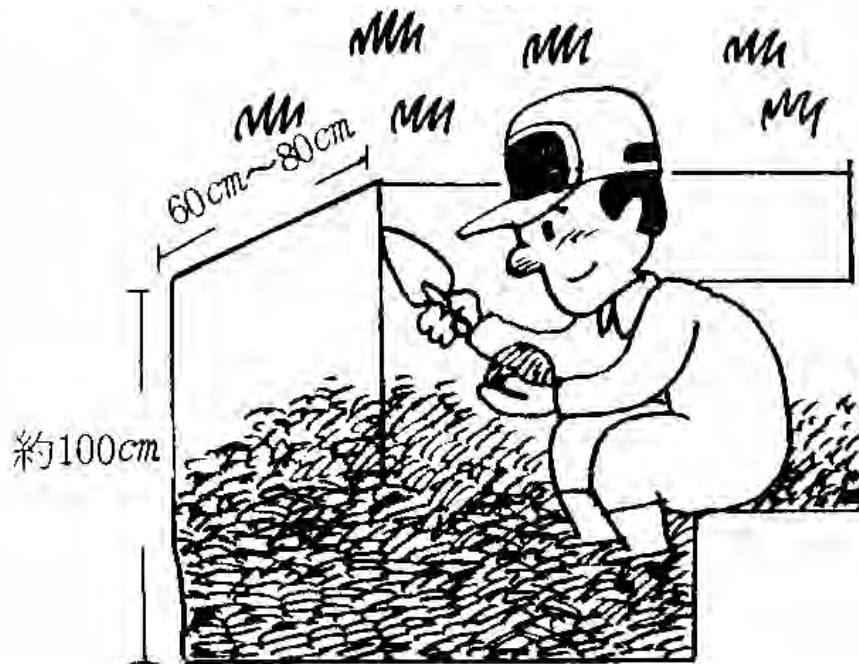
Field



Laboratory

Flow sheet of soil diagnosis 3

Soil profile survey



- Depth of plowed layer
- Texture of plowed and sub-layer soils
- Soil color
- Sand and stone
- Volcanic ash
- Wetness