Introduction to Acid Deposition Monitoring (3)
Soil and Vegetation Monitoring

ADORC

Contents

- Sampling
  - Selection of monitoring site
- Analysis of samples
  - Methods of soil chemical analysis
- QA/QC program
  - Repeat analysis

Site selection criteria of soil and forest monitoring

(a) Two forest sites, whose soils have different sensitivities to acid deposition, are recommended to be selected.

(b) Each site should be established in a continuous forest area of more than one hectare.

(c) Sites must be accessible for surveying over a long period (decades).

(d) Preferably, a common tree species or the dominant vegetation type between the sites will be selected.

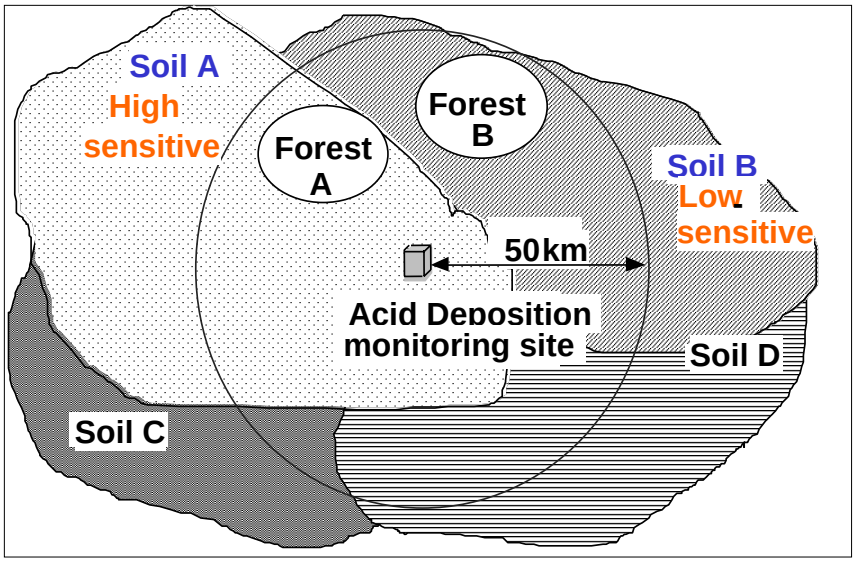
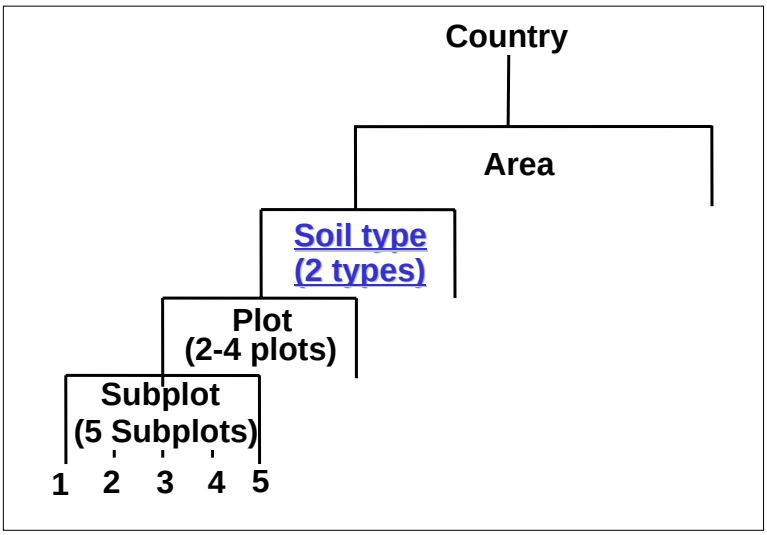


Image of the Permanent monitoring sites



Two soil types should be selected.

However, in a few participating countries, especially in tropical region, it is difficult to find two soil types in an area within 50km from acid deposition monitoring site.

To select two soils

- Classification in detail

e.g.) Ferralsols can be classified in detail to six units; Orthic-, Xanthic-, Rhodic-, Humic-, Acric- and Plinthic ferralsols.

- Consideration of parent materials

For seeking different soil types, geological map may be useful since some chemical properties of soil may be originated from the parent materials (rocks).

Mandatory items for chemical analysis of soil

- Moisture Content
- pH (H_2O) and pH (KCl)
- Exchangeable Base Cations (Ca, Mg, K and Na)
- Exchangeable Acidity
- Effective Cation Exchangeable Capacity (ECEC)
- Carbonate Content (only for calcareous soil)

To obtain comparable data

- Extraction principles for the chemical analysis in the technical manuals should be strictly followed.
- If experimental apparatus and/or procedures, such as sample volume and extraction time, were modified due to the situation of the laboratory, the modification and the scientific reason of the modified procedures should be recorded.

Estimation of analytical quality in a laboratory

In order to evaluate within-laboratory-reproducibility condition, for all samples, analysis should be repeated with the condition that some or all of analyst, time, and instrument are different.

Data Report 2002

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Outline of the Monitoring Site in 2002

Country	Nearest deposition monitoring site	Site	Soil type	Items*1
Philippines	Los Banos	Mt. Makiling	Eutric Cambisols	S
		UP Quezon, Land Grant	Dystric Nitosols	S, F
Russia	Listvyanka	Bolshie Koty	Mollic Leptosols Umbric Luvisols	F
Thailand	Vachiralongkorn Dam	Vachiralongkorn Dam	Ferric Acrisols	S
		Vachiralongkorn Puyea	Luvisols	S, F

*1. S, Soil monitoring; F, Forest monitoring

Outline of the data 2002-1

- Philippines

Two forest areas with different soil types were selected around Los Banos, and unpublished data of soil analysis and forest monitoring in 2001 were submitted in addition to the data of 2002.

Chemical properties of two soil types :

Eutric Cambisols: relatively high pH (ca. 6: low acidity), high contents of base cations (more than 10 cmol(+)kg)

Distric Nitosols: low pH (high acidity), low base cations

Tree decline of UP Quezon:

No decline symptoms were observed.

Outline of the data 2002-2

- Russia

Forest monitoring was carried out for *Pinus sylvestris, Larix sibirica* etc. in Bolshie Koty according to the EANET Technical Manual (The monitoring was done according to European (ICP Forests) methods in past years).

Some decline symptoms, such as deterioration of branch growth and density of foliage, were reported. However, it was estimated that specific natural condition (e.g. steep slopes, poor soils) of this area and insect caused the symptoms.

Outline of the data 2002-3

- Thailand

  New forest area with a different soil type, Vachiralongkorn (Puyea), was selected around Vachiralongkorn Dam in addition to the forest area near the Dam.

  Chemical properties of two soil types :

  Ferric Acrisols (Dam): relatively high pH (ca. 6: low acidity), high contents of base cations (more than 10 cmol(+)kg)

  Luvisols (Puyea): low pH (high acidity), moderate base cations

Summary-1

- Three countries, namely Philippines, Russia, and Thailand, submitted the data.
- The monitoring in these areas was carried out basically according to the EANET Technical Manual. The situation has been improved.
- However, a few technical subjects should be improved further more: e.g. collection of soil by fixed depth, implementation of repeat analyses, etc.

Summary-2

- Two forest areas with different soil chemical properties were selected around Los Banos and Vachiralongkorn Dam, respectively. Data of these forest areas would be informative for comparison of the soil sensitivities to acid deposition.

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