

C-2 Evaluation of Effects of Acidic and Oxidizing substances in Plants

Contact Person Isao Hotta
Section Director
Forest Environment Division, Forestry and Forest Products Research
Institute, Ministry of Agriculture, Forestry and Fisheries.
1 Matsunosato, Kukizaki, Ibaraki 305 Japan
Phone +81-298-73-3211 (Ext. 358) Fax. +81-298-74-3720

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Dynamic Analysis of Acid Deposition in Sugi (*Cryptomeria japonica*) Forests and Prediction of Its Effect on Forest Growth,

1. Declined Sugi forests in Kanto and Kansai were characterized in terms of morphology.
2. The analysis of rainfall, throughfall and stemflow on pH and soluble substances revealed the dynamics of acid deposition in Sugi forests, and showed the acidification of stemflow and soils around Sugi trees.
3. The study on soil buffering action demonstrated its mechanism and lowness of the superficial soils and acidified soils in buffering capacity.
4. The experimental study showed that artificial acid rain did not affect Sugi seedlings greatly.
5. Sugi was low in tolerance against water deficits because of its rapid transpiration rate and high resistance of flow.
6. Statistical study displayed a close correlation between air temperature in summer and declination of Sugi.
7. The concentrations of Al and K in the needles of declined Sugi were high and low, respectively.

Impact of Acid Rain on Plant-Environment Systems

1. The method for analyzing aerosol was developed, and it was cleared that conifer needles catch.
2. The exposure of acid fog or ozone damaged some plants physiologically.
3. The characteristics of lichens water extract was exhibited to be an indicator for air pollution.

Effect of Acid Rain on Crops and Agricultural Environment

1. The decrease of photosynthesis by acid rain differed among the crops, and was attributed mainly to the decrease of chlorophyll content in leaves.
2. The dry weight of most crops decreased by the exposure to artificial acid rain (pH<3.0) except for rice plant.
3. The column experiment with artificial acid rain revealed that exchangeable base is the major source of soil buffering capacity, and Al dissolves at base saturation less than 3 %.
4. Acid neutralization capacity of irrigation water suggested low possibility of its acidification as far as pH of rainfall is no lower than 4.