

INVESTIGATION ON EFFECTS OF THE FOREST CANOPY  
ON ACID AND SULFUR PRECIPITATION  
IN THE RUHR DISTRICT, GERMANY

W. KNABE AND K. H. GÜNTHER, Landesanstalt für Immissions-  
und Bodennutzungsschutz des Landes Nordrhein-Westfalen, Essen.

ABSTRACT

Ecosystem analysis as part of the International Biological Program, has shown that a considerable amount of nutrient input comes from the air through the filter action of vegetation. As investigations were carried out in remote areas, it appeared highly desirable to explore the conditions in the Ruhr district, one of the major industrial areas of the world.

Samples were taken every fortnight from rain collected by means of a .5 m<sup>2</sup> gutter. Amount of rainfall and concentration of sulfur and hydrogen ions were determined in the laboratory.

Results show a very clear increase in the concentration of sulfur (S) and hydrogen (H<sup>+</sup>) ions under the canopy of stands of beech (Fagus sylvatica L.), oak (Quercus sp.), Scots pine (Pinus sylvestris L.), and Norway spruce (Picea abis Karst), in this order, when compared with rain collected outside the forests above vegetation. This increase cannot be explained by the loss of water through interception in the crown because precipitation of S and H<sup>+</sup> per square meter shows the same trend.

The results are discussed under the aspects of air pollution control and acidification of soils. The improvement of air quality which would be the effect of any filtering action of the vegetation appears positive for industrial regions, whereas the additional input of acids into forest ecosystems may have negative effects on productivity and water quality even at a great distance from the source of emission.