Acid deposition and its contribution to soil acidification

JIN-LING YANG [1], GAN-LIN ZHANG [1*]

[1] State Key Laboratory of Soil and Sustainable Agriculture, Institute of Soil Science, Chinese Academy of Sciences, Nanjing 210008, China
(*correspondence: glzhang@issas.ac.cn)

Soil acidification caused by external inputs of proton (H^+) are environmental problems that exist on a global scale. To understand the contribution of acid deposition to soil acidification, we have monitored the wet and dry deposition and stream water in the subtropical rural area for five years.

The results showed that the acid deposition was severe in this area. The frequency of acid rain was more than 90%, of which severe acid rain was more than 50%. The annual direct input of H^+ to the watershed by rain was 216-1049 mol ha^{-1} yr^{-1}. The ratio of nitrogen to sulphur show that air pollution was characterized by a combination of NO_x and SO_2 pollution. NH_4^+ was the dominant form of inorganic N input, while NO_3^- was the dominant form of N output. Furthermore, the input of total inorganic N from rain was more than two times higher than its output by stream water. Therefore, The H^+ production from nitrogen transformation was 295-618 mol ha^{-1} yr^{-1}. The production of H^+ by SO_2 transformation was 250 mol $ha^{-1}yr^{-1}$ from dry deposition. It is estimated that the consumption of H^+ through the specific adsorption of SO_4^{2-} was 104-295 mol ha^{-1} yr^{-1}. In the total input of protons, the direct input of protons from rain accounted for 47%, while proton production from the transformation of N and S was 37% and 16%, respectively.

Amount of proton entered into soil with wet and dry deposition even in the rural area. However, the pH of stream water was about neutral. This implies that a large amount of external H^+ input has been neutralized by the soil, which will cause soil acidification.

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