Incorporating P.M. 2.5 to Improve Harvested Rainwater Quality

Baek, Seung-a (School: McIntosh High School)

Acid rain is any form of precipitation, including rain, snow, or fog, with high levels of sulfur dioxides or nitrogen oxides. And micro dust is a transboundary problem consisting of both natural yellow dust and man-made ultrafine dust. What makes micro dust so harmful are the secondary particles from the oxidation of primary particles, and the main source of such particles has been linked with the burning of fossil fuels. In most research done on micro dust so far, the focus has only been put on the negative effects or consequences of micro dust. However, with Hans Egnér's overlooked research with precipitation samplers at farms revealing the growing complexity of both acid rain and micro dust, it has been proposed that micro dust may have the ability to act as a buffer against acid rain. Therefore, if micro dust was somehow inserted into buffer-lacking soil, it could help cancel out the negative effects of acid rain and help protect ecosystems. His suggestion for further research was incorporated to develop a simple but effective experiment to prove that atmospheric particulate matter can neutralize acid rain. The procedures were to first collect the micro dust from car emissions, insert it into prototype acid rain, and compare the resulting changes in pH. Further research could focus on how to insert this method of neutralization into the real world through testing of hydroponics or incorporating artificial trees such as the Supertrees of Singapore.

Awards Won: