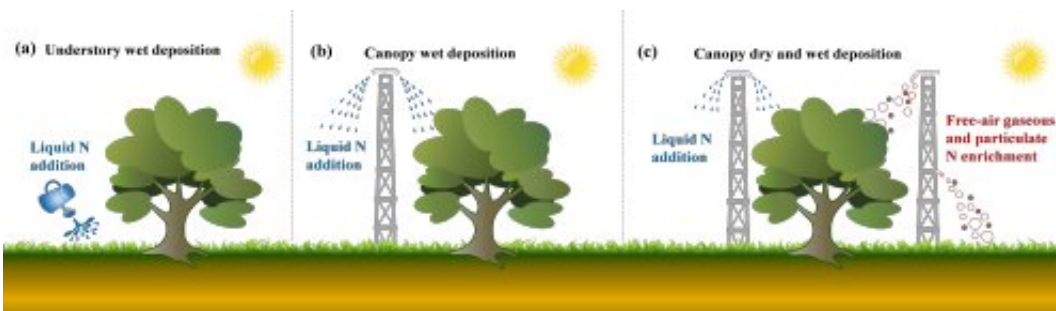


# Ammonia has been missing in portraying air pollution impacts

March 20 2020, by Li Yuan



Manipulative field experiments mimicking nitrogen deposition. Credit: PAN Yuepeng

Nitrogen is essential for all living things. Synthetic fertilizer, which contains rich reactive nitrogen, has sustained food production, but the nitrogen it emits is also a burden to the environment, such as air pollution, soil acidification, and water eutrophication.

Although numerous field studies have been conducted to understand the implications of atmospheric nitrogen deposition in the environment, conventional manipulative experiments have mostly been employed by adding nitrogen solution directly onto grassland or forest floors (soil).

In an article recently published in *Atmospheric and Oceanic Science Letters*, Dr. Pan Yuepeng from the Institute of Atmospheric Physics (IAP) of the Chinese Academy of Sciences and his coauthors challenged

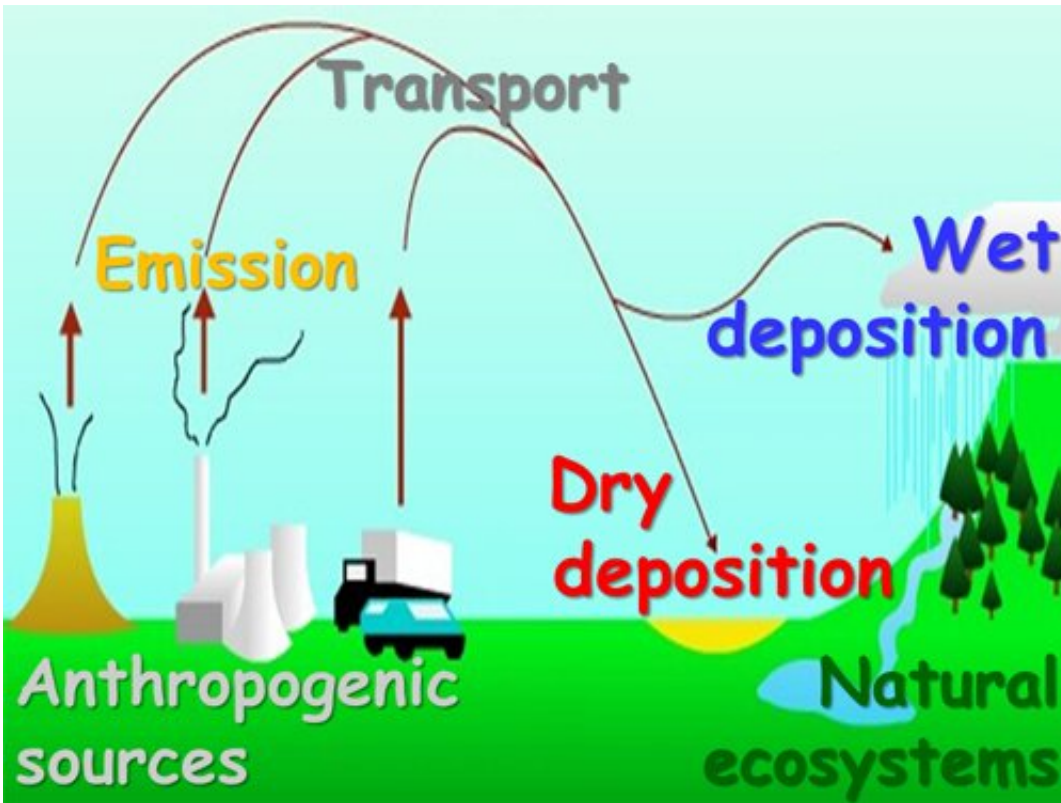
the traditional approach in evaluating the impacts of nitrogen deposition.

"There are three ways for nitrogen to be deposited: rainfall, aerosol and gas; and spraying nitrogen solution onto soil assumes that atmospheric deposition occurs mainly as rainfall (wet deposition)," says Dr. Pan.

"However, dry deposition of gaseous and particulate reactive nitrogen species, especially [ammonia](#), is also an important deposition process."

Dr. Pan also pointed out that there were a limited number of field studies investigating the bidirectional exchange of ammonia between the atmosphere and plants, not to mention the impacts of ammonia on natural ecosystems.

"Ammonia plays a vital role in nitrogen deposition and haze pollution. To make things worse, atmospheric ammonia concentrations have increased worldwide in recent decades," said Dr. Pan. "The next generation of field experiments simulating [nitrogen deposition](#) should further consider ammonia."



Nitrogen deposition via rain, gas and aerosol. Credit: PAN Yuepeng

**More information:** Yuepeng PAN et al. Ammonia should be considered in field experiments mimicking nitrogen deposition, *Atmospheric and Oceanic Science Letters* (2020). DOI: [10.1080/16742834.2020.1733919](https://doi.org/10.1080/16742834.2020.1733919)

Provided by Chinese Academy of Sciences

Citation: Ammonia has been missing in portraying air pollution impacts (2020, March 20) retrieved 31 January 2025 from <https://phys.org/news/2020-03-ammonia-portraying-air-pollution-impacts.html>

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