



## **Nitrous acid (HONO) emission affected by germination of seeds**

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A close link between soil nitrogen (N) cycle and HONO emission has recently brought high attention in the scientific community because HONO is one of the major precursors of hydroxyl radical (OH); an atmospheric detergent which removes many atmospheric pollutants including strong greenhouse gas, methane (CH<sub>4</sub>). Agricultural soils receiving different forms of N fertilizers and with vegetations are of especial interest since both practices are well known to influence the N dynamics of soils. Therefore, we anticipate that HONO emission could be also altered significantly. So, to understand the effect of such practices, we followed the HONO emission from two acidic distinct agricultural soils, organic and mineral, until 11 days after sowing the presoaked (~16h) wheat seeds; a globally important crop after rice. Both soils also received fertilizer (NH<sub>4</sub>NO<sub>3</sub>) equivalent to 259 kg N ha<sup>-1</sup> y<sup>-1</sup>. Our finding suggests that the onset of seed germination profoundly stimulate the formation of nitrite (NO<sub>2</sub><sup>-</sup>) and thus HONO efflux from the seeded samples of both soils in contrast to unseeded ones. In addition, with the increasing above ground biomass, the HONO emission decreases suggesting the possible consumption of HONO on leaf surfaces during stomatal conductance or decrease in the supply of HONO formation precursor in soil i.e. NO<sub>2</sub><sup>-</sup>. We also studied other crops like pea, barley, oat, and maize and found a similar germination effect on HONO flux. Our study, therefore, concludes that HONO emissions during the early growth phase of seeds could lead to the substantial release of HONO from soils to the atmosphere and should be included in the global HONO budget