

### 3.030 N<sub>2</sub>O and NO processes in soil.

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Abstract:

Nitrous oxide (N<sub>2</sub>O) is an important greenhouse gas and its atmospheric concentration is increasing as a result of increased use of nitrogen fertilizers in the world. However, its emission from ecosystems occurs sporadically and suddenly and prediction of the magnitude of emission is still quantitatively difficult because its production processes from soil are not fully understood. Furthermore, nitric oxide (NO) and nitrogen (N<sub>2</sub>) are important in soil nitrogen processes and NO is a precursor of N<sub>2</sub>O and N<sub>2</sub> is a product from N<sub>2</sub>O during denitrification processes. Then, we are investigating N<sub>2</sub>O production processes in soil with emissions of nitric oxide (NO) and nitrogen (N<sub>2</sub>) in laboratory. We constructed a system to simultaneously measure NO, N<sub>2</sub>O, and N<sub>2</sub> from soil in laboratory. And we are investigating emissions of these gases in relation with various parameters such as temperature, soil moisture, oxygen (O<sub>2</sub>) concentration and so on. By making it possible to control O<sub>2</sub> concentration, the effects of O<sub>2</sub> and soil moisture can be separately considered. Denitrification processes are considered to be major in N<sub>2</sub>O emission. In our experiments, during denitrification processes: a lot of NO was produced in soil; it is revealed that soil water is found to be important to process reactions from NO to N<sub>2</sub>O and N<sub>2</sub>O and N<sub>2</sub> by blocking gas transports in soil and giving longer residence time of NO and N<sub>2</sub>O in soil.