

# EFFECT OF SOIL PHYSICAL PROPERTIES ON N<sub>2</sub>O ISOTOPE FORMATION

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## **Abstract**

In order for life to arise and exist on earth, a number of important processes take place in it, based on various elements. One of these elements is nitrogen (N). Nitrogen is the most common element in the atmosphere approximately 78% of the atmosphere consists of nitrogen gas (N<sub>2</sub>), but in this way, the majority of the living organisms cannot absorb nitrogen. Nitrogen fixation occurs during the nitrogen cycle and results in a number of complex organic compounds required for living organisms. During the nitrogen life cycle, the formation of the organic compounds required for plants results in by-products, which may have a negative impact on the environment. One of these by-products is N<sub>2</sub>O gas. N<sub>2</sub>O is one of the greenhouse gases. The purpose of this article is to clarify the impact of soil physical properties on the formation of N<sub>2</sub>O isotopes. The samples were collected in 28 test fields. Samples were weighed in 3 l buckets, each in 1.8 kg of soil. Two samples were from each field to allow different humidity conditions. Wetting is designed for wet aerobic and humid anaerobic soil conditions. Information on soil weight changes following soil wetting was also collected. Measurements for N<sub>2</sub>O isotopes were performed in laboratory conditions using Picarro G5131-i. The data obtained were collected and analyzed. It was concluded that not all of the resulting differences in isotope data and interlineations of N<sub>2</sub>O could be directly linked to the physical properties of the soil. Differences between the enzymatic differences of microorganisms and the effect of the population of microorganisms cannot be excluded.

**Keywords:** N<sub>2</sub>O isotopes, soil moisture, Picarro G5131-i