

Nitrogen, a key element for the future of agricultural production systems

Nitrogen use efficiency (NUE) is an indicator of plants' ability to use available nitrogen and improve their vegetable production. In agricultural terms, it implies an optimum use of nitrogenized mulches and fertilizers in order to obtain a high production yield at lower financial costs and minimizing negative impacts on the environment.

Besides proper use and management of nitrogen fertilizers, biotechnological techniques must be used leading to improved understanding of the physiological, metabolic and genetic mechanisms of the systems involved in absorbing, assimilating and remobilizing nitrogen elements in the vegetable tissue of different grass and forage crops in Colombia's high, medium and low tropical regions. This detailed knowledge would promote the adoption of better techniques for nitrogen fertilization and biotechnological management, for benefiting both the environment and the agricultural production system.

Extending this knowledge, in the short term, would permit the development of genetic varieties that are can more efficiently absorb and assimilate nitrogen elements, which would translate into more efficient and environmentally sustainable production processes. One of the first steps in analyzing the physiological, metabolic and genetic complexities and functionalities of nitrogen absorption and assimilation would be identifying, describing and evaluating the genes that encode for NO_3^- and NH_4^+ .

A growing and exponential environmental crisis and an increasing birthrate around the world, among others, will exert great amounts of pressure on agricultural production, reducing arable areas and increasing a demand for animal protein; therefore, anything that can improve the efficiency of agricultural production systems and, specifically, grass and forage crops as nutritional support for one of the main sources of protein on the Planet Earth, will be extremely important for food safety in our region.

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¹ Singh, R. P., Jaiwal, P. K. 2006. Biotechnological approaches to improve nitrogen use efficiency in plants. Houston Tex. USA: Studium Press. Pp. 25. ISBN: 0-9761849-9-0.