Temporal Origin of Nitrogen in Rice Grain Determined by a Point-Placement Technique. (C02-sheehy214558-Poster)

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Abstract:

In high yielding rice cultivars, roots appear not to capture sufficient nitrogen (N) to meet the demand created by grain filling. Furthermore approximately 70% of fertilizer nitrogen is lost from irrigated rice systems. It has been hypothesized that N captured during the vegetative stage of growth acts as a reservoir to supply the shortfall. Our main objective was to test the hypothesis by investigating how effectively N captured at different stages of the growing season was retained and used for grain growth. Our secondary objective was to investigate the usefulness of a point-placement technique for investigating nitrogen-use and loss in irrigated rice. The point-placement technique was used to deliver a precise amount of 15N to a specific location in the soil. An amount of urea 15N, equivalent to about 4h of daily N uptake, was placed in gelatin capsules and injected 5-7cm into the soil-root interface zone of a hill. Following application hills were harvested through to maturity, the total N content of the crop was measured twice weekly. Results obtained supported the hypothesis; theory was developed those enabled rate coefficients for N capture and loss to be calculated. The results, albeit fascinating, left us wishing we had asked a number of additional questions before designing the experiment.

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