RegenPGC Graduate Education Community

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Investigating the Fate of Nitrogen Fertilizer in Perennial Groundcover Corn Cropping Systems

Abstract Perennial groundcover (PGC) systems offer a promising strategy to improve nitrogen (N) use efficiency and reduce environmental N losses in corn-based cropping systems. However, little is known about N dynamics in PGC systems, particularly under different suppression regimes. This study evaluated the fate of applied fertilizer N in corn grown with suppressed and unsuppressed Kentucky bluegrass groundcover, compared to a conventional tilled control. Field experiments were conducted near Boone, Iowa, using replicated microplots and two fertilizer treatments: a non-fertilized control and a fertilized treatment receiving 180 lbs N per acre as urea. Soil and plant samples were collected at corn growth stages V6, VT, and R6 to quantify N uptake and partitioning. Suction cup lysimeters installed below the root zone monitored nitrate leaching throughout the growing season. Preliminary results suggest that suppression of groundcover did not negatively affect the N recovery and N uptake . These findings provide insight into N dynamics in PGC systems and support their potential as a sustainable strategy to enhance nutrient management in corn production.

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