

IRRIGATION AND N FERTILITY RATES STRATEGIES TO POTENTIALLY REDUCE N LEACHING FROM AGRICULTURAL FIELDS IN NORTHERN FLORIDA REGIONS

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Excessive nutrients in waterbodies, such as nitrate-N, have been one of the major issues in unconfined regions underneath the Upper Florida aquifer during the last decades. With the aim to meet the numeric nutrient criteria (NNC) of 0.35 mg/L for nitrate-N in springs and streams, irrigation and N fertilizer best management practices (BMPs) have been implemented as potential strategies to reduce nutrients leaving the agricultural fields. A field experiment was conducted in Live Oak, Florida to evaluate several BMPs in a corn and peanut conventional rotation. The experiment design was a randomized complete block arranged in a split plot with four replications. Three irrigation treatments (i) GROW, mimics grower's irrigation practices, (ii) SMS, uses soil moisture sensors to monitor volumetric water content and activate irrigation and (iii) NON, non-irrigated/rainfed; and three N fertility rates (i) low (157 kg N/ha), (ii) medium (247 kg N/ha), and (iii) high (336 kg N/ha) were evaluated. The evaluation of the DSSAT crop growth models with field measurements provided good performance on the irrigated treatments, but a lower model performance was found in the rainfed treatment. Overall, the GROW– high N treatment results showed lower N uptake and larger N leaching amounts, whereas the opposite effect was found in the SMS – high and medium rates. During seasons with heavy rainfall events, important N leaching amounts resulted during the fallow periods after corn production in the NON – high N treatment. Thus, using a sensor-based methodology for irrigation scheduling and a medium N rate that close to the UF/IFAS recommendation can reduce irrigation amounts and N leaching from agricultural fields. However, even following a careful irrigation and fertility management, N leaching may result if rainfall amounts and distribution exceed the low soil water holding capacity characteristic of sandy soils.

PRESENTER BIO: Dr. Zamora-Re investigated different irrigation and N fertilizer BMPs as part of her PhD. in the Agricultural and Biological Engineering Department. Previously, she had led several projects focused on water efficiency and conservation. Currently, Dr. Zamora-Re is a Post-Doctoral Associate at the University of Florida working on irrigation scheduling and water allocation for blueberries in Florida.