



# ► RICE PRESENTATIONS

Program 17R-2

## ► Nitrogen Concentration In Rice Floodwater Following Fertilization Application

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Agriculture is considered to be a leading source of nutrients delivered to the Gulf of Mexico and thus contributing to the hypoxia issue. Arkansas is the leading rice-producing state in the nation. Besides the environmental concerns, rice farmers are

looking for ways to be more efficient in nutrient applications due to high fertilizer prices. In Arkansas, nitrogen is typically applied in split applications with the first application before first flood and a second mid-season application where the nitrogen is directly applied to flooded fields using aerial application. Previous plot-scale studies have shown that nitrogen concentrations in flooded rice fields can dissipate in a matter of days. The purpose of this study was to determine changes in nitrogen concentration in rice floodwater following fertilizer applications on a commercial rice field. To determine how the concentration of nitrogen in rice floodwater changes and how long it takes it to move into the soil, water samples were collected using Sigma 900 automated water samplers located in three different rice bays within a private, commercial rice field. The samplers were situated on the edge of a rice field and the water intake hose was placed seven meters out in the bay. The intake nozzle was secured to a piece of rebar driven into the ground to prevent it from moving. Once the floodwater was deep enough for the sampler to collect a sample the units were turned on. For the first 24 hours a sample was collected every hour. On the second day a sample was collected every three hours. On the third day a sample was collected every six hours. On the fourth day two samples were collected, every twelve hours. The samplers were then set to collect one sample a day for the remainder of the fourteen day study. Samples were processed in the field and shipped to the Arkansas Water Resources Center lab for analysis.

Based on an initial review of the data we see that the nitrogen concentration is decreasing at a rate to be practically nonexistent in the floodwater by day eleven or twelve.

This work should help to show that the rice field is its own ecosystem and that only in extenuating circumstances, heavy rain after flood up, would significant water with nitrogen concentrations leave the field and possibly contribute to any downstream issues.