**Nitrogen Leaching Measurements**

 Producers usually apply more than enough nitrogen (N) because they think rainfall will leach much of the N that they apply. However, this assumption may be costly. To evaluate the efficacy of N application in corn fields and the environmental effects of N losses, it is important to know the leached N amount.

We use an accurate, non-destructive method (agricultural meteorological method) to measure leached N amounts in corn fields. The amount of leached N is associated with the amount of leached water and the N concentration below the root zone. But the amounts of leached N are generally unspecified because measurements and estimates of leached water quantities are problematic at best. We will use an agricultural-meteorological method: Leached water will be measured as rainfall minus evapotranspiration (ET). Daily rainfall will be measured by weather stations, and daily ET will be measured by eddy-covariance systems. N concentration below the root zone will be measured by soil sampling and testing.

Eddy-covariance systems will be set up. This project will quantify N leaching in different N application practices to determine which practices yield the least amount of N leaching. This information can help in N application management.

In the long-term, we believe that this research will show how different practices affect the N supply for the corn crop (N efficiency), enabling the development of management strategies to maximize N utilization efficacy while minimizing losses to the environment. In addition, the datasets will help the modeling work.