

Missouri Study Shows the Environmental Advantage of ESN



Controlled Release Fertilizer

A *smarter* source of nitrogen. A *smarter* way to grow.

This figure shows the nitrate measured in the subsoil for ESN and urea. Suction lysimeters are a device used to extract the soil solution for the purpose of measuring soluble nutrients in the soil. When placed at different depths in the root zone, they are useful for monitoring the downward movement of mobile nutrients such as nitrate-nitrogen. Note that subsoil nitrate concentrations with ESN are only a little more than for an unfertilized control early in the season while urea moved downward early in the season. This means nitrogen from ESN is staying in the root zone and more available for plant uptake during the time when plants need it most. The early summer of 2004 was an extremely wet period and conventional N fertilizers were subject to severe losses. Nitrogen treatments were broadcast and incorporated before planting.

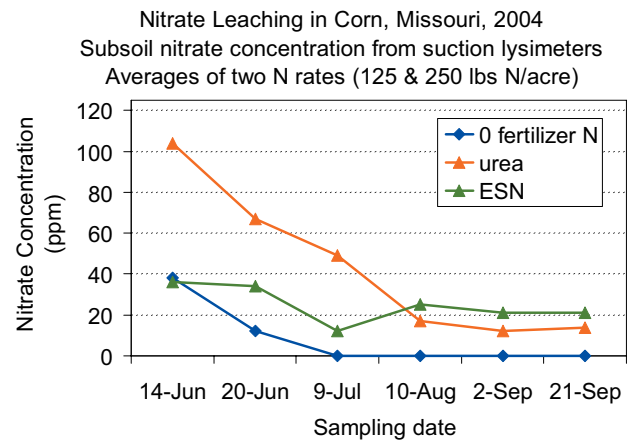


Figure 1. ESN reduced downward leaching of nitrate in a Missouri corn study.

A second component of the Missouri study is to measure nitrous oxide emissions from fertilizer treatments. Nitrous oxide is a greenhouse gas that can be emitted from soil when nitrate nitrogen is present under oxygen-deficient conditions. When the soil is saturated, anaerobic bacteria (bacteria that function in the absence of oxygen) convert nitrate to several gases (nitrogen gas, nitrous oxide, and/or nitric oxide) that can be lost from the soil. This process is called denitrification. Nitrous oxide emissions from the soil are one measure of denitrification. In 2004, a very wet spring, these soils were subject to saturated conditions that resulted in large losses of N by this process. Note that significantly less loss occurred from ESN, keeping more N in the root zone for the crop.

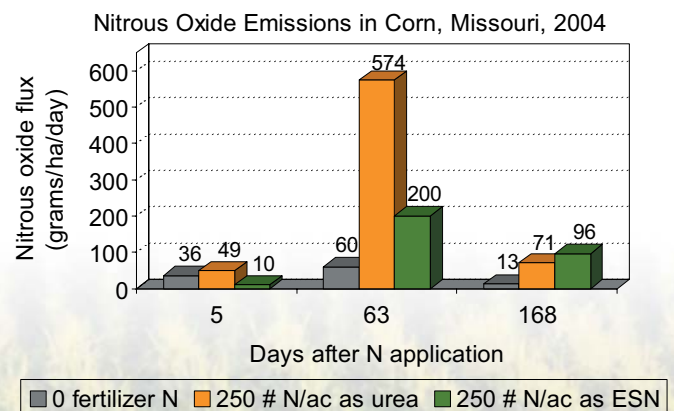


Figure 2. ESN reduces losses of N to the atmosphere by denitrification.

Source: Dr. Peter Motavalli and Dr. Kelly Nelson, University of Missouri.