



Studies Look at Nitrogen Availability from Liquid Manure

One of Iowa's greatest natural resources is, at least by some accounts, its most objectionable. As one of the top states in pork production, there is a wealth of liquid swine manure available for row crop production in the state. When misused or mishandled, that wealth can become an economic and environmental threat.

Liquid swine manure is commonly used as a source of nitrogen for corn production, but the question is, could farmers be getting more out of it than they are?

Manure contains both organic and inorganic forms of nitrogen. Inorganic nitrogen, the form that's in commercial fertilizer, is readily available to plants – and may be subject to leaching or denitrification. Organic nitrogen is bound up by carbon in undigested feed and bedding material. For the nitrogen to be available to the plant, soil microorganisms must first consume the carbon compounds in which it is contained. This process immobilizes the nitrogen, at least for a time. Because of this, and the unpredictability of microbial activity in the soil, it is difficult to predict how soon the nitrogen from the manure might be available.

For two years now, manure trials conducted by the On-Farm Network™ as part of the West Buttrick Creek watershed program in Greene county, have shown that between 60 and 70% of the nitrogen contained in manure will be

available to the corn crop in the first year.

The objective of the study was to calculate equivalency (credits) of nitrogen contained in liquid swine manure by comparing it to nitrogen availability from commercial fertilizer.

In mid April of 2005, liquid swine manure was injected into the soil at three sites in the West Buttrick Creek Watershed. Manure was applied at a rate of 150 lb of total nitrogen per acre at two sites and 125 lb of total N/acre at one site. Two sites were planted to corn after soybean and one site was planted to corn after corn.

Urea ammonium nitrate (UAN) solution was sidedressed at rates of 50, 100, 150, and 200 lb N/acre on June 2 at each site.

Manure and UAN treatments were applied in 300-foot long strips in four replications. The corn strips were harvested with a combine equipped with a yield monitor and GPS receiver.

Corn after soybeans

High variability in yields was observed for both UAN and manure treatments. When data from two sites for corn after soybean were pooled, nitrogen from manure was equivalent to 68 % of nitrogen applied as UAN.

An additional 50 lbs. per acre of UAN was applied on top of the manure in some strips. This increased yields, but yields did not reach a maximum. However, yield responses

