

# Soil Samples Show Nitrogen Loss

By Peter Scharf

After a long, wet spring, I'm getting questions about possible nitrogen loss from all over Missouri and even from other states. My column with a 'Nitrogen Loss Scoresheet' in the last issue of the IPCM Newsletter provided one possible tool for evaluating risk and making decisions.

Deep soil samples provide a more accurate and specific answer, but are hard work to get and require waiting while the lab work is getting done. Larry Mueller has worked with me to sample some producer fields for nitrogen over the past week or two. The results show that anywhere from 40 to 180 lb N/acre have been lost from the sampled fields.

Eight fields were sampled to a depth of three feet. Available N (nitrate and ammonium) was measured and totaled for this depth.

Normally, about 50 lb available N/acre will be found in unfertilized fields. If no N had been lost, we would expect to find this 50 lb plus whatever fertilizer the producer applied. For example, if a producer applied 160 lb N/acre and none was lost, we would expect to find 210 lb N/acre in our soil samples.

From this expected total, we subtracted what we actually found to estimate the amount that had been lost.

The amount of N that had been lost ranged from 40 to 180 lb N/acre, with an average of 95 lb N/acre. At least some of the fields were selected due to conditions that would favor

N loss, so I would expect that losses are smaller on an average corn field in Missouri.

The largest losses were seen on fields with well-drained soils and fall-applied N. Not all fields in this category had severe N loss (some had lost as little as 65 lb N/acre), but I suspect that most fields in this category would give hefty responses to additional N applications.

About a month ago, Ron Catlett from Central Missouri Agri-Services in Blackburn (west of Marshall) took deep soil samples from a number of fields and found N loss ranging from 40 to 100 lb N/acre. That agrees fairly well with our more recent samples, except that the top end of our N loss range was higher, probably due to consistent additional rains in the meantime.

The short message is that there are probably a large number of corn fields in Missouri where yields will be limited by nitrogen availability unless additional fertilizer is applied. Factors that make serious N loss more likely include:

- 1) fall application,
- 2) early spring application of N sources other than anhydrous ammonia,
- 3) well-drained soils, and
- 4) multiple days of saturation after May 15.

*Peter Scharf*  
*ScharfP@missouri.edu*