

# Tillage and Fertilizer Application Before Soil Sampling

Fall soil sampling season is upon us once again. It's time to look at which fields need updated grid sampling and any new fields that need sampled. Before having those fields sampled, here are things to consider. With any soil sampling, we are trying to understand what the nutrient levels are in the main growing zone of the soil so we have a foundation to work with when prescribing the best fertilizer and soil amendment recommendations. **The soil test results will be only as trustworthy as the quality of samples that are taken.** Any nutrient application to the field before sampling, especially once it has been incorporated by either tillage or rainfall, will skew the soil sample results. Since fertilizer mineralization and crop removal rates differ across a field, and there wouldn't be a starting point to consider, it is virtually impossible to calculate exactly how much fertilizer or manure applications will skew the results. This leads to inconsistent and inaccurate fertilizer recommendations, over and under application, for future crops until the soil is retested. Tillage of any kind, but especially deep tillage practices, create air pockets and loose soil, causing inaccurate and inconsistent core quality and depth. Deep tillage exposes the deeper soil horizons that wouldn't normally be sampled, causing lower than normal nutrient levels and higher than normal pH analysis. Top soil is also piled up in places during tillage, causing higher than normal nutrient levels and lower than normal pH analysis. Either of these will cause poor nutrient recommendations and inaccurate fertilizer and amendment applications, potentially hurting yields on the one side and causing excessive fertilizer and lime costs on the other.



Figure 1 - Brown soil from deep horizon mixed with top soil.



Figure 2 - 2 inches of soil in probe.

Proper soil sampling cores are taken 6-8 inches deep. In the following pictures, random probes were made throughout a moldboard plowed field with a 12-inch soil probe. While the probe was inserted into the soil the full length of the probe, in each case much less than 12 inches of soil was pulled. Most generally only 2-4 inches of soil resulted in the probe. Even when a soil core was taken in a compressed area of the plowed field, such as the tire track pictured in Figure 4, only 2-3 inches of soil resulted in the soil probe.



Figure 3 - 4 inches of soil in probe.



Figure 4 - 3 inches of soil in probe, taken in compacted tire track.

By waiting to work, fertilize, and amend a field until the soil sampling has been completed, we can ensure the highest quality soil cores are taken and the most accurate test results are processed from the lab. This will make for the most accurate and precise fertilizer recommendations and application rates.