KANSAS STATE UNIVERSITY | Extension
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**Tips to Reduce Variability in Soil Sampling**

As a big proponent of soil sampling, I think there's great value in it – when it's done well. Unfortunately, if you've ever received instructions prior to pulling a soil sample, it can feel like a lot of information with little explanation. Two of the instructions: sampling depth and number of cores per composite sample may seem like small details but are important to help us reduce sampling variability and get the best information we can from the sampling process.

Research on the variability of phosphorous soil test levels provides a good picture of how collecting more samples results in more precise values than when we collect fewer samples. It makes sense: more sample points cover more area and give better information. Unfortunately, more sample points require more sampling time and bulkier samples to mix. Fortunately, research has shown there *is* a bit of a 'sweet spot'.

That research showed that while 40 or 50 cores per sample resulted in the greatest confidence in the results (plus or minus two parts per million) we can very close to that same level of variability with 15 to 20 cores (plus or minus three parts per million at 20 cores). Drop to less than 15 cores and variability increases quickly, so while it takes a little more time, the confidence level in the results is well worth it.

The second instruction is depth. By their chemical nature, nutrients move at different rates through the soil profile. Add in tillage practice, fertilizer application method, rainfall, etc… and it's easy to understand why nutrient levels can differ at different levels of the profile and why a consistent sampling depth is important. Even a difference of one inch in sampling depth can alter soil test result values and sometimes recommendations as well.

As valuable of a process as it is, soil sampling isn't ever going to be perfect. A little more time spent taking the correct number of samples at the correct depth, however, can help make them even more precise – and give us more confidence in the results.