Soil Quality Enhancement Activity – SQL15 –Utilize the soil health nutrient tool to assess soil nutrient pools

Enhancement Description
Use a soil health nutrient tool to assess soil nutrient pools for soil health.

Land Use Applicability
Cropland, Pasture

Benefits
The new soil health nutrient tool is a set of soil test procedures that comprehensively integrate soil nutrient recommendations with soil biological traits. Soil biology is more involved in the supply of crop and/or forage nutrient needs than previously believed. Studies show less than 50 percent of the nitrogen in harvested plant parts can be attributed to added fertilizers. The other sources of the nutrients are biological N-fixation, microbial oxidations and natural weathering. Soil microbes mediate many of the important nutrient transformation processes and nutrient-plant transactions. Failure to measure potential nutrient pools means farmers and ranchers may over-fertilize potentially impacting both soil and water quality.

Conditions Where Enhancement Applies
This enhancement applies to all crop and pasture land use acres.

Criteria
Annually collect soil samples and have samples analyzed by a lab using the USDA Soil Health Nutrient Tool method.

1. Sampling procedure
   a. Take 15-25 core samples randomly from each identified field. Mix samples thoroughly and save enough to fill a 1 quart Ziploc bag.
   b. Consider previous crop row spacing and fertilizer placement, avoid over sampling in these areas
   c. Collect core samples to a depth of 6 inches
      i. Long term no-till field should be sampled to a depth of 4 inches
2. Sampling equipment
   a. Use a stainless steel soil-sampling probe
      i. Shovels can be used if they are rust free and clean
      ii. The sweatless soil sampler, as described by Oklahoma State University, is a good alternative to achieve uniform depth and mixing of samples http://soiltesting.okstate.edu/sweatless-soil-sampler/PT2003-6SweatlessSoilSampler.pdf

3. Handling
   a. Samples DO NOT need to be air dried prior to shipping, but should not be saturated either
   b. Label sample and include the following information:
      i. Name
      ii. Email
      iii. Phone
      iv. State field located
      v. County/Parish field located
      vi. FSA Tract number
      vii. FSA Field Number
      viii. Land use- cropland, pasture
4. Ship Samples to:
   a. Any laboratory capable of performing the Haney Soil Heath Nutrient Test.
   b. Contact your local NRCS Field Office for a list of available labs.

Adoption Requirements

This enhancement is considered adopted when the land use acre and its contiguous field acres have a soil health tool report.

Documentation Requirements

1. A map showing fields where samples were collected.
2. Copy of the Soil Health Tool Report

References

Brinton, W.R., Haney, Rick. 2013. Solvita CO2-Burst Respiration: A Rapid Means to Gauge Soil Biological Activity and Potentially Mineralizable Nitrogen. International Symposium on Soil and Plant Analysis, ISSPA, New Zealand

Doran, J. 1997. Soil Respiration Test Comparisons, University of Nebraska, USDA ARS

Fanzluebbers, A.J., Haney, R.L., Hons, F.M., and Zueberer, D.A. Determination of soil microbial biomass and nitrogen mineralization following rewetting of dried soil. Soil Science Society of America Journal 60:1133-1139. 1996

Harmel, R.D. 2013. Initial Field Evaluation of the Agro-Economic Effects of Determining Nitrogen Fertilizer Rates with a Recently Developed Soil Test Methodology. Open Journal of Soil Science 3:91-99 (USDA ARS)

USDA 1999. Soil Respiration Test Guidelines, Soil Quality Institute, USDA ARS