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WHAT MAKES A GOOD SOIL TEST?

Soil testing is recommended for soils all over the world, but its success and failure depends on many factors that can not be neglected if the test is to be useful. This is a good time of year to consider why soil testing should be an essential part of your farming operation and what it takes to get useful agronomic information. Sometimes complaints are heard that results from soil testing are not as accurate as desired, but potential problems can almost always be avoided by remembering these four factors.

Field Sampling. Accurate soil testing begins with taking a sample that will accurately represent field conditions. There are several techniques for field sampling (such as grid sampling, management zone sampling, and field averaging), but all these sampling schemes attempt to reflect the true nutrient status of a known part of the field. Depending on soil factors and the crop grown, the depth and method of sampling may vary. A soil analysis can never be more accurate than the sample that is submitted to the laboratory. A single sample rarely represents the true nature of an entire field and the inherent variability that is almost always present. Carefully follow the sampling recommendations from your testing laboratory or crop adviser, and keep detailed records of where the samples came from.

Laboratory Analysis. After the sample is sent to the laboratory, the nutrients must be extracted and converted to a form that can be analyzed with highly specialized equipment. The extracting solution used by a laboratory must be calibrated for regional conditions and soils. Most extracting solutions have been made especially for specific soil conditions. For example, if a soil sample from Florida is sent to California for analysis, it is possible that less-than-optimal tests may be used, unless the laboratory knows in advance where the sample came from. Generally, it is advisable to work with a reputable soil testing laboratory within your general geographic region unless they know your special requirements and will work with you to meet your specific needs.

Interpreting the Laboratory Results. Once the procedures are completed in the laboratory, the analytical results must be interpreted to provide agronomically useful information. The interpretation is done by relating the soil test information with the results of previous crop responses conducted in the field over many years and locations. Good soil fertility research is essential for providing the data to determine the effect of nutrients on different crops grown on a range of soils. There now seems to be less of this type of essential research done at many universities; but there is still need for examining new crop varieties and production techniques. Field validation of soil test results remains a key foundation for proper interpretation.

Making a Fertilizer Recommendation. Professional agronomists at the soil testing laboratory can only make an accurate fertilizer recommendation if they are provided with as much background information as possible. To make the proper recommendation, they need to know things such as accurate soil test results, the crop to be grown, crop responsiveness to fertilization, yield goals, recent history of legumes or animal manure application, and the potential mineralization of soil organic matter.

Economic considerations are also important when making a final fertilizer recommendation. This is especially true for determining the value of additional crop yield related to the cost of the fertilizer. While exact cost/benefit calculations may be difficult due to yield and price uncertainties, some general principles are useful. Economists agree that profits (maximum economic yields) are achieved at production levels very close to maximum yield. Aiming for high yields is the best way to reduce the unit cost of production and remains the key for more overall profits.

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