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Soil Science for Productive and Cost-Effective Food Plots

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By the time you read this article most hunters have already descended upon their favorite hunting grounds and planted food plots in preparation for deer season. Planting food plots in the fall is a very popular method for attracting deer during the hunting season, and much consideration is generally given to the many different food plot products available. Little consideration, however, is given to more important factors such as soil pH and fertility; neglecting to properly manage these factors will result in a less than productive food plot and the waste of financial resources. In this article, we attempt to explain soil science as it relates to food plot production and economics, and we hope that the information presented here will help you with your food plot management program.

Most hunters in Alabama are somewhat aware of the diversity of soils found throughout the state, such as the Blackland Prairie, Coastal Plain, Piedmont, etc. However, to grow productive food plots and eliminate financial waste, hunters must be well versed in the soils in which they plant food plots. For example, soil analysis from a food plot in the Blackland Prairie region may have a cation exchange capacity (CEC) value of 8-11 and a pH of 7, whereas soil analysis from a food plot in the Coastal Plain region may have a CEC of 4-7 and a pH of 5. What is CEC? Soil scientists use the term "cation exchange capacity" to explain the capacity of the soil to retain and transfer nutrients. The type of clay, and the amount of clay and organic matter in the soil are all used to determine the CEC of a particular soil. So, what does all of this mean to hunters who plant food plots? Nutrient retention and availability are dependant upon CEC; therefore, CEC affects the availability of nutrients to plants, which affects food plot production. A soil with a low CEC value (usually sandy soil with little to no topsoil) may require small quantities of fertilizer on a frequent basis to maintain sufficient levels of nutrients for optimum food plot production. This type of soil cannot "hold" excess fertilizer; therefore, an over application of fertilizer will often result in leaching of nutrients below the root zone of the plants and eventually out of the soil profile all together. On the other hand, a soil with a high CEC value (usually heavy clay soils or soils with a thick, dark topsoil) is better at holding nutrients when applied; therefore, fewer fertilizer applications are needed for adequate food plot production. However, when high CEC soils are nutrient deficient, larger quantities of fertilizer are often needed to correct the deficiency. Hunters can use their knowledge of CEC to develop fertilizer plans appropriate for their specific type of soil and increase the cost-effectiveness of growing food plots.

Hunters should collect soil samples and have them analyzed to determine the quality of their soils before developing a fertilizer plan. To properly collect a soil sample, take several cores throughout the food plot and mix them together in a clean container. The number of cores needed largely depends on the size of the food plot; as a general rule, take 10 cores per acre of food plot. Soil cores should be collected from the root zone, which for most food plot selections occur within the upper 8 inches of the soil. After soil cores have been collected and mixed into a container, take enough soil from the container to fill a soil sample box. Boxes and information on soil laboratories can be obtained from your local Cooperative Extension or Natural Resources Conservation Service (NRCS) office. If possible, sample each food plot separately and be sure to

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Kenny Denham uses a handheld GPS unit to determine the size of the food plot.

CLAUDE JENKINS

label each sample on the box and soil test form to correspond with the respective food plot. Also, be sure to list the crops to be grown on the form that accompanies the sample. Properly collecting and labeling samples is essential to ensure reliable recommendations.

The soil test results sent to you from the soil laboratory will determine pH and the amount of available nutrients for each food plot sampled. It will also provide recommendations for lime and nutrients (i.e. fertilizer) needed for optimum plant (i.e. food plot) production; recommendations are based on the difference between the available nutrients and the amount needed by the plants for optimum production. Soil test results can be confusing and many hunters are left scratching their heads trying to make sense of it. So, where do you start? Correcting the soil pH – if necessary – should be the first step. In a food plot with acidic soil (low pH), nutrients are bound to soil particles making them unavailable to the plants; therefore, if fertilizer is added to this plot, much of the fertilizer – and the money invested in fertilizer – will be wasted. Lime should be applied to food plots with a low pH according to the soil test results to increase the pH and free nutrients for plant uptake. Apply lime well in advance of the planting date to allow the lime time to activate with the soil and raise the pH. As a general rule, apply lime at least 90 days prior to planting. The nutrients most commonly tested for include nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg). Recommendations for these nutrients can vary greatly; thus, requiring a custom blend of fertilizer. Unless you have a small number of food plots, it's not cost-effective to custom blend fertilizers for each plot; however, food plots can be divided into groups with similar nutrient requirements and a custom blend fertilizer can be created for each particular group. Local fertilizer dealers such as a farmer co-op may be able to develop a custom blend for you, or if a pre-mixed fertilizer is used, they can recommend the best fertilizer to meet your needs.

Knowing the size of food plots before applying lime and fertilizer is important to insure that the proper amount of amendments is applied. Handheld GPS units are very common these days and can be used to take the guess work out of determining the size of food plots. Most all GPS units will calculate acreage by walking the outer perimeter of the food plot to be measured; measurements can be given to the nearest tenth of an acre. Of course, there is the "old school" method of determining the size of food plots: measure the length and width of food plots to determine the area in square feet, and then divide this figure by 43,560 to obtain acres. The old school method is accurate on evenly shaped food plots, but can be inaccurate on irregularly shaped plots – here's where a GPS unit can be helpful. Not applying enough lime and fertilizer will result in low food plot production and a waste of money. Applying too much can contribute to plant toxicity or nutrients not used by plants and a waste of money. Also, applying too much can contribute to excessive nutrient runoff resulting in contamination of drains, creeks, or streams.

Unfortunately, hunters plant thousands of acres in food plots every year without knowing the proper amount of lime and fertilizer needed for productive and cost-effective food plots. Too much emphasis is often placed on what to plant, not on what matters most: soil pH and fertility. For more information on soils in your area and how to manage your soil for food plots, contact your local Cooperative Extension or NRCS office.