

Soil Fertility in Forage Production Important for Good Yields

WOOSTER, Ohio - When it comes to growing grass for hay production or for pasture, soil fertility often takes a back seat to nutrient management for other field crops. Ohio State University soil specialist, Maurice Watson, said that knowing and maintaining correct soil pH and nutrient concentrations before seed planting and after establishment are important for obtaining maximum yields. "Many times soil fertility is ignored for grass pasture and grass forage production when compared to many of the cash crops," said Watson. "To get maximum grass forage production, the status of the soil's fertility should be known and adjusted, if necessary."

The best management practice for achieving optimum soil fertility is to test the soil several months prior to seeding the grass crop. Farmers should keep in mind the following guidelines when testing their fields:

* **Maintain an optimum pH level of 6.0-6.5.** If the soil pH becomes less than 6.0, other nutrients such as phosphorus, calcium and magnesium become less available to the plant. It is best to optimize the soil pH several months before planting. If the soil is excessively acidic, an application of limestone is recommended. Under most climate conditions, the lime will begin to show its effect by increasing the pH of the soil within three months. However, it is usually best to apply the limestone six months before seeding.

* **Maintain adequate nitrogen to obtain high yields.** Nitrogen should be applied at the rate of 20-40 pounds per acre at seeding. An additional 30-50 pounds per acre should be applied in late summer or early fall of the same year. Yearly applications of nitrogen are needed after establishment of the grass crop. Some common sources of nitrogen fertilizers are urea, 28 percent urea-ammonium nitrate solution, ammonium nitrate, and manures.

* **Establish optimum phosphorus concentrations prior to planting.** Phosphorus is essential for plant growth. It is much more difficult to substantially increase phosphorus levels once the grass crop is established. Some common sources of phosphorus are triple super phosphate, di-ammonium phosphate, mono-ammonium phosphate and ammonium polyphosphate.

* **High-yielding grass forages have a high demand for potassium.** It is very important to build the soil potassium levels up to the critical level before seeding, which can be done by broadcasting potassium-containing fertilizer on the soil and working it into the soil. Application rates exceeding 300 pounds per acre of actual potassium should be split into two applications, tilling after each application. Some common potassium containing fertilizers are muriate of potash, sulfur-potassium-magnesium (Sulf-Po-Mg), blended fertilizers, and manures. If manures are used, it is best to wait 10 to 14 days after manure application before seeding. The manure should be worked uniformly into the soil to a depth of at least 4 to 6 inches.

* **Maintain sufficient levels of magnesium.** If magnesium levels are low in relation to potassium levels, the plant will tend to take up more potassium. This condition can contribute to grass tetany "shock" in livestock that feed on the forage. If the addition of magnesium is recommended, the most common magnesium fertilizer sources are dolomitic limestone, magnesium oxide, and Sulf-Po-Mg.

* **Keep an eye on sulfur deficiencies.** Sulfur is an important constituent of proteins in plants. Rarely does a sulfur deficiency occur, but when it does, it most likely occurs in sandy soils with very low organic matter content. The sulfur status is considered low when sulfur concentration in the leaf tissue is less than or equal to 0.20 percent. If additional sulfur is needed, the most common sources to use are flowers of sulfur (yellow powder), Sulf-Po-Mg, gypsum, ammonium sulfate, and manures.

* **Take precautions when adding micronutrients to the soil.** The plant requires these nutrients in very small amounts and an over-application can be toxic to the plant.

"Establishing optimum soil fertility before planting will pay benefits in greater yields and better quality of grass forage over many years," said Watson. "Trying to make large changes in the soil's fertility after the crop has been established is expensive and not as effective as doing it before planting."