

Introduction

Pastures of perennial forage grasses and legumes can be largely sustainable with limited inputs of fertilizer, since the only nutrients exported are in the body composition of the grazing animals when good management is utilized. However, some nutrients need to be replenished, especially nitrogen (N), when pastures are mostly composed of grasses.

When properly managed, pastures will respond to fertilization and produce large quantities of high-quality forage and livestock products. For example, grass forage production may be increased from 35 to 80 pounds dry matter per acre for every 1 pound of nitrogen applied. Generally, balanced plant nutrition will provide a balanced diet to the animals.

Irrigated pastures in southern Idaho are composed of primarily grasses or grass-legume mixtures. The plant composition of the pasture can be changed by fertilizer management and grazing method. Continuous grazing will reduce sensitive plants—generally the more palatable plants—and promote resistant plants, whereas rotational grazing allows the palatable, more desirable plants to persist.

Grasses adapted for irrigated pastures include: brome grass, perennial ryegrass, and orchardgrass for well-drained soils; fescue and wheatgrass for saline soils; and creeping meadow foxtail and reed canarygrass for wet soil. These grasses can produce good summer regrowth if irrigation, grazing, and nutrients are well managed.

The highest producing grass-legume mixtures usually include one or more of the above grasses with a well-adapted legume variety. The legume variety forms, but are concentrated next to water sources, shade, bedding areas and trails. Concentrations of phosphorus and potassium within 30 feet of water sources have been reported to be 5 times greater than other areas of the pasture after 4 or 5 grazing seasons. In fact, when grazing activity is managed in a similar pattern for more than 20 years, phosphorus and potassium concentrations can be increased up to 100 feet away from the water source. Grazing management that uses a high stocking rate—many animals on a small area of the pasture—and movement of portable fence, water, and

process called mineralization. The mineralized nutrients are taken up by plant roots for new plant growth, or may be converted into organic matter by the soil microbes, through a process called immobilization. Some nutrients such as nitrate are highly water soluble and can be leached from the soil by water flow to the groundwater. Some nitrogen is also lost through volatilization to the atmosphere.

These two issues—nutrient distribution and nutrient cycling—affect when and where you should take your soil samples for testing.

Soil Testing in Pastures

First, divide up your pasture into “zones” to account for manure concentrations, and test each zone separately, so that nutrients can be applied only at the rate needed and in areas where they are needed according to the soil test. Thus soil samples from around watering and shade areas should be taken separately from the remaining area of the pasture.

Keep in mind that soil test results may include fer-

