Pasture Management

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Pasture use and needs are different for every farm. Pasture can be used to supplement rations or for the bulk of the forage in the ration. In either case, there are a few key factors to look at to maximize productivity of the pasture system.

Soil Testing

Soil testing is a tool used to assess the concentration and availability of nutrients. Nutrient availability is assessed by determining the pH of the soil. The ideal range for nutrient availability is 6.2 to 7.5. When soil pH is less than 6.0, the availability of nitrogen, phosphorus, potassium, sulfur, calcium, and magnesium decreases, and the availability of micronutrients that can cause toxicity increases. Soil pH can be increased with the addition of liming materials. In a pasture situation where soil is not being disturbed, fall application of lime is most effective when the height of the pasture is lowest so the lime can make soil contact. Additionally, the natural freeze and thaw cycles allow for some incorporation into the soil.

Standard soil tests can measure phosphorus, potassium, calcium, magnesium, sodium, aluminum, zinc, sulfur, manganese, iron, copper, and boron. Nutrient application recommendations are based on the analytical extraction method used and the production expectations of the pasture. Keeping records of grazing time, stocking rate, mowing yields, and any nutrient applications will lead to the most accurate recommendations for additional nutrient applications. Pasture production nutrient needs can be supplied from animal wastes or commercial fertilizers.

Pasture Forage Testing

Using pasture forage testing and soil testing together will give you the most accurate nutrient recommendations. Mineral concentrations in the pasture forage test are directly related to mineral concentrations of soil results. An example of a soil sample and a pasture forage sample submitted from the same pasture is shown in Table 1.

Item	Pasture (MMG), % DM	Typical Pasture Test Range (MMG)	Soil, PPM (Morgan Analysis)	Soil Test Range
Phosphorus (P)	0.40	0.2 – 0.46 %	7	Medium
Potassium (K)	3.10	1.4 – 3.46 %	134	High

Table 1. Pasture tissue test and soil test results. A medium soil test range for P has a recommendation for 20 lbs/ac of P2O5 to meet crop needs. The plant test for the pasture has a result for P at the high end of the typical range, indicating that soil and nutrient applications are meeting plant needs. High soil test K has a recommendation for 0 lbs/ac of K2O from fertilizer and the plant test for the pasture is also at the high end of the typical tissue range indicating that the plant K needs are being met from the soil and nutrient applications.

Pasture forage testing also lets you evaluate nitrogen use and needs. Nitrogen is not measured on soil tests due to its dynamic behavior in the soil. Soil health tests can provide a measure of the potential for the soil organic matter to provide N. Pasture forage testing will provide crude protein. Crude protein is a measure of the total N in the tissue multiplied by 6.25, and is directly related to the amount of N the plant took up. Crude protein concentration in the plant can be influenced by soil N coming from the breakdown of organic matter by soil microbes and N applied from animal manures or commercial fertilizers.

Pasture forage testing is also useful to determine whether or not you are meeting the nutritional needs of your animals. A pasture forage test will provide measures of crude protein, fiber, sugar, and mineral concentrations. Crude protein and fiber concentration are influenced by the stage of plant maturity. As maturity of the pasture increases, fiber concentrations increase and protein concentrations decrease. Increased fiber concentrations are related to decreased intake and energy from the pasture. Timing of grazing or harvest can be used to effectively manage fiber and crude protein concentrations.

Other Considerations

Weeds. There are many plants that will move into your pasture; some of these, like clover, are of low concern, but others, like poison hemlock, can be more troublesome. In general, if animals are getting enough to eat and the pasture is in good condition, they will avoid the weeds. Spot spraying or frequently cutting the weeds is a good way to control weed problems in a pasture if you do not want to rotate the pasture to a new crop. Maintaining good pasture condition and not overgrazing or overcrowding is the biggest step in avoiding weed problems.

Water sources. Natural or installed water sources can experience lots of changes from cold weather, freeze-thaw cycles, and flooding. If you are using natural water access, checking to make sure that water access areas are stable and free of debris will be important for maintaining banks and limiting animal injury. Water lines for all installed systems need to be checked before they are used. Cracks and broken pipes can result in a loss of pressure to water tanks, wasted water, and areas of standing water. Low water pressure and slow filling rates in water tanks on pasture will decrease water intake, and in turn, decrease milk production. Decreased water intake can also increase the impact of heat stress and lead to other disease problems. Areas of standing water can harbor breeding mosquitos and contribute to spreading disease. Testing all water sources in the pastures (natural and installed) is important to make sure that the quality of the water will not limit intake.

Fencing and grazing management. Using a combination of some rotational grazing and mowing through the season will help you provide more consistent yield and quality for the animals. In the spring, it is important to make sure that all the permanent fencing is solid for the safety of your animals. As you walk the pasture and inspect the permanent fencing, it is also a good time to observe the pastures and think about paddock sizes. Paddocks are sized based on animal number, animal growth stage, number of days in the paddock, and total available pasture acres. There are management programs and professionals to help you calculate your paddock size and rotation schedule.

To help you monitor and manage your pasture, the Dairy One Forage Lab and Agro-One lab offers a Pasture Management Package. The Pasture Management Package ($75.00) is designed for use in one pasture during one season and includes 3 forage testing kits and a soil test kit. Ideally, sample the pasture during the early, mid and latter part of the grazing season to monitor pasture quality and supplement as necessary. Soil testing is best done in the fall. This will help determine if lime application is required and help you plan for other nutrient needs for next spring. With the results of each forage sample, you will receive an interpretive sheet with the Dairy One Forage Lab sample ranges for comparison to your results and some management suggestions for changing your pasture.

For more information, please visit our website at www.dairyone.com, or call us at 800.344.2697.