



Basic Pasture Management

For the Equine Owner

Proper pasture management leads to high quality, productive pastures that can supply excellent nutrition for horses. However, pasture management can be challenging because of continually changing environmental conditions and fluctuations in horse populations residing on the farm. Adopting good pasture management practices is increasingly important as stocking density or number of horses per acre increases. In most areas, pastures can be maintained with very little management at densities of 2 – 4 acres per horse. At higher animal densities, good management practices are necessary to maintain plant canopy cover and desirable plants. Without adequate pasture acreage, horse owners will need to limit turnout time to prevent overgrazing and supplement with hay to help meet equine nutritional requirements. The management practices, outlined in this fact sheet, can be adopted to help maintain healthy, productive pastures that benefit the horses, the farm, and the environment.

Test Your Soil

Proper fertilization is imperative to maintaining high quality forage in pastures. Soil nutrient levels and pH are extremely variable from farm to farm. Therefore, it is

important to accurately determine the nutrients and pH of the soil by performing a soil analysis. To obtain soil test kits and receive directions on how to collect a soil sample, contact your local Extension office or an analytical laboratory. After submitting the sample, the lab will provide a complete soil analysis, which will document soil nutrient levels and pH. The report will also provide recommendations for the application of fertilizer and lime.



Take soil samples 4 inches deep for pastures.

Apply Fertilizer and Lime Based on A Soil Test

Maintaining proper soil pH is essential for healthy forages. Soil pH is a measure of the acidity in the soil. A pH of 7 is neutral. A pH greater than 7 is basic, and less than 7 is

acidic. Grass forages perform well in soils with a pH between 6 and 7. Acidic soils are detrimental to plant health and productivity because acid conditions limit the availability of the soil nutrients. Lime is basic in nature. Therefore, application of lime increases soil pH and makes the nutrients in the soil more available to the plant.

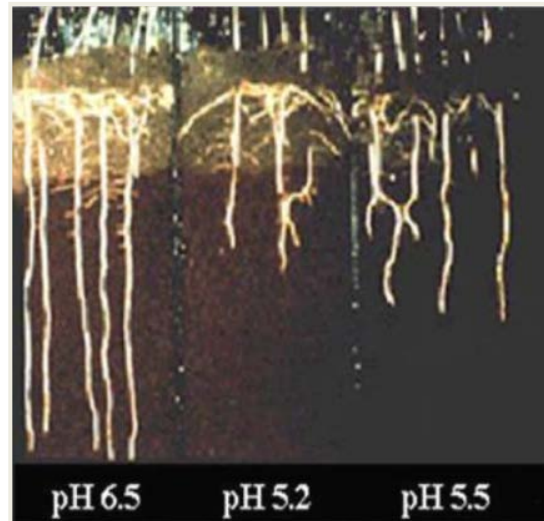
Plants also require nutrients for growth and reproduction. Soil test results identify nutrient deficiencies and provide nutrient recommendations for optimum crop production. The three primary nutrients included in the soil test report are nitrogen (N), phosphorus (P), and potassium (K).

For grasses, nitrogen is a critical nutrient for forage quality and growth. Adequate nitrogen is associated with a dark green color and vigorous, vegetative growth. Pale green or yellow color and poor growth is a symptom of nitrogen deficiency. Too much nitrogen applied at one time can cause animal health and water quality problems, so nitrogen applications should be divided into multiple, smaller applications.

A good rule of thumb is to apply 50 pounds of nitrogen per acre at the onset of the spring growing season and then restrict subsequent applications to 30 pounds per acre to match forage growth. The majority of nitrogen should be applied in the spring and fall. Summer applications are appropriate if growing conditions, temperature and moisture, are optimum for pasture growth.

Phosphorous and potassium are also vital nutrients. Phosphorus improves forage quality and root development. A well-developed root system increases the plant's ability to acquire nutrients and water from the soil.

Potassium improves the plant's ability to survive periods of stress such as drought or freezing winter temperatures and conditions. Potassium deficiency is characterized by poor growth, reduced disease resistance, and reduced winter-hardiness.



Acidic soils prevents not only adequate nutrient uptake, but also restricts and stunts root growth.



A basic pull – behind spinner spreader works well for applying fertilizer and lime to small acreage pastures.

Mow Your Way to a Healthier Pasture

Mowing helps maintain a high-quality uniform pasture, and promotes tillering, which generates dense, leafy vegetation. In addition to maintaining quality and productivity of favorable species, mowing also helps prevent the growth of weeds.

Mowing at the proper height is an important component in maintaining the health and survival of pasture grasses. Grasses store their energy reserves in the bottom few inches of the plant, so mowing too low reduces their reserves and the ability of the plant to re-grow. When mowing, maintain a forage height of 2 to 3 inches if the pasture is composed primarily of fine bladed short grass species, such as perennial ryegrass and bluegrass. For taller, higher yielding species such as orchard grass or timothy, mow to maintain a slightly higher level of 3 to 5 inches.



Mowing pastures not only encourages tillering, but also reduces weed populations by preventing seed head formation and limiting new generations of weeds.

Reduce Weed Pressure

Weeds can be a serious problem in pastures because they compete with desirable forages for space, nutrients, light, and water. Some weeds, if ingested, are toxic and harmful to animal health and should be eliminated. Weeds rarely out-compete healthy pasture grasses but they will quickly take over if the pasture is not managed to ensure the growth of the grasses. It is important to address weed issues prior to establishing a new pasture. In established pastures, the most effective weed management technique is to maintain a healthy stand of grasses and legumes, which compete with the weed seedlings. Good pasture management will help prevent weed proliferation.

When weeds become a continual problem, herbicide applications may be warranted. However the use of herbicides alone will not provide a permanent solution to weed control. The conditions that caused weeds to proliferate should also be addressed. Reseeding the pasture with desirable forages will hinder the re-establishment of weed seedlings and promote the growth of grasses and/or legumes. It will be necessary to manage and maintain conditions that will promote forage growth.

Plan all herbicide programs wisely. Remember that broad leaf herbicides will also eliminate desirable legumes, like clover and alfalfa, from pastures along with the weeds. Most pasture herbicides available today do not have grazing restrictions and animals do not have to be removed from the pasture. However, label restrictions must be adhered to carefully. Many herbicides have forage reseeding restrictions and cannot be applied to new forage seedlings. Several labels restrict products from being used on

pastures if the manure is collected and applied to gardens or broad-leaf crops. The label warns against potential damage that residual herbicide in manure can cause for sensitive broad-leaf plant species.

Before choosing an herbicide, it is important to identify the type of weeds in the pasture because product efficacy varies by species. An herbicide that eliminates one weed species might not have activity on another. In addition to selecting the correct product, it is important to apply the herbicide at the right time. Identifying the life cycle of the weed ensures that the herbicide can be applied at the most vulnerable periods of plant growth.

Weeds differ in species, persistence, and life cycle. Perennial weeds live more than one year and are dormant in the winter. The ideal time to control perennial weeds is late summer when the weeds are moving their food reserves into the roots. Canada thistle, curly dock, and milkweed are examples of perennial weeds that commonly grow in pastures.

Annual weeds only live one year, but are prolific seed producers. The parent plant will die but the weed seeds that are produced can germinate and produce many plants the following year. Annual weeds exist as summer annual or winter annual weeds.

Summer annual weeds produce seeds in the summer. The seeds survive the winter and germinate the next spring. A thick, healthy stand of grasses should be able to compete and hinder growth of newly emerging weed seedlings in the spring. If summer annual weeds do become established, then the mature weeds will be highly visible in summer, when the cool season grasses slow their growth due to hot, dry conditions.

Mowing can sometimes effectively reduce weed seed production and will help reduce weed pressure. It is a poor decision to use herbicides to eliminate summer annual weeds in late summer because the plants have already dropped their seeds and are beginning to die. The ideal time to control summer annual weeds with herbicides is in the spring, when the weed seedlings are very small. Examples of some common summer annual weeds are lamb's quarters, ragweed, and pigweed.

Winter annual weeds such as chickweed and mustard also live one year, but germinate from seeds in late summer. Winter annual seedlings appear in pastures in early fall and persist as plants throughout the winter. Winter annual weeds flower very early in spring, drop their seeds, and die. By summer, winter annual weeds are no longer competitive in the pasture.

Since winter annual weeds are present in spring and fall, when cool season grasses are rapidly growing, it is rarely necessary to control these weeds. Healthy pasture grasses should be able to prevent the germination of winter annual weed seeds and reduce the survival of any seedlings. If pasture growth is poor and the elimination of winter annuals is warranted, the best time to apply herbicide is late summer, after the weed seeds have germinated.



Curly dock, pictured above, is a perennial weed that competes with grasses and reduces pasture forage quality.

Pastures Need Rest, Too

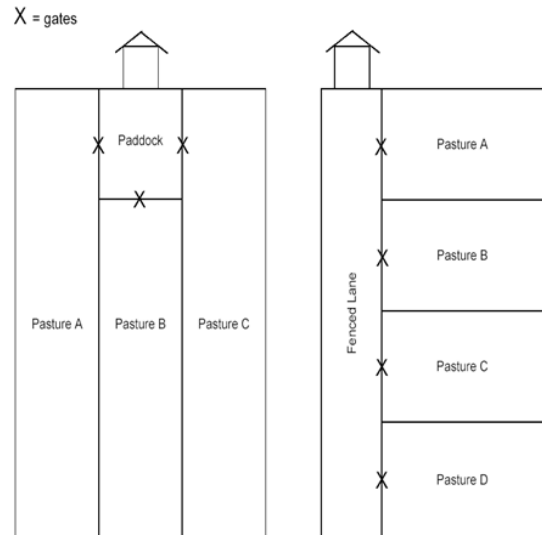
Rotational grazing systems improve the pasture productivity by allowing grasses to restore energy reserves required for growth. Developing a strategic plan to rest and rotate pastures, allows the manager to obtain more forage and greater use of multiple pastures.

Horses can cause significant damage to pastures. Hooves cause soil compaction and a running horse can trample and shear off pasture plants. The precision of a horse's lips and teeth allow horses to remove plants at ground level. Horses tend to graze in the same location area repeatedly, graze the same plants because of enhanced nutrition and palatability. Repeated intense grazing can damage parts of the plant necessary for regrowth and can eliminate plants from the pasture, reducing the concentration of high quality forage. Therefore, pasture rotation is essential to good pasture management practices.

Repeated, close grazing of grasses depletes energy reserves, reduces growth, and eventually kills the plant.

As stocking density increases, the implementation of a rotational grazing system becomes more important. Even a simple two-paddock system will produce results. To set up a two-paddock system, place one cross-fence across the pasture and rotate the horses between the two pastures.

Turn animals into the pasture when the grass is 7 to 10 inches tall and allow them to graze it down to 3 to 4 inches. A grazing system with more than two paddocks will provide additional improvements in the performance of the pasture.



A rotational grazing system can be set up by using temporary tape to divide large pastures or by installing permanent smaller paddocks.

Planned Animal Concentration Areas (ACA)

Additional steps may be required to give grasses adequate rest. During hot, dry weather, when grasses are stressed and growth is limited, pasture access should be restricted. Areas designed to confine animals that have little to no vegetation are known as Animal Concentration Areas (ACA). These areas also are known as sacrifice lots, barnyards, exercise paddocks, dry lots, or heavy use areas.



The Animal Concentration Area (ACA) should be built with animal comfort in mind.

A planned ACA can be a valuable component of a well-managed farm. ACAs can be used to remove animals from pastures to protect new growth and existing vegetation during periods of adverse growing conditions, or if the number of animals exceeds the ability of the desirable forage in the pastures to survive and recover from grazing.

The sacrifice area should be sited on high ground, at least 100 feet from any wetlands, streams, or ponds. The area should have a slight slope and should not be located in a bowl or depression where water naturally collects. Clean water from upslope fields,

driveways, and barn roofs should be diverted away from and around the sacrifice area.

Construction of the sacrifice area should involve covering the area with a layer of stone aggregate topped with a minimum of 2-3 inches of finer stone dust. The sacrifice area should be surrounded with vegetation to filter out any organic matter and sediment that might run off. Manure should be routinely picked and moved to a manure storage area.

The compacted stone dust layer is often used as the surface of the ACA. There are several materials that can be used to cushion the surface layer. Wood chips and sawdust provide cushioning, but care must be taken to ensure the material does not contain harmful wood products; such as black walnut or cherry. Gravel and sand can also be used, but horses should not be fed on sand, since it can cause colic and impaction if the sand particles are ingested.

Pasture Renovation

Pasture renovation is an effective way to improve stand density or introduce new species into existing pastures. Following a few simple management strategies will ensure the establishment of new seedlings.

Selecting the most appropriate time of year to seed the pasture greatly influences stand establishment. Spring and fall are ideal seasons to plant; however, fall is usually the preferred seeding time in Pennsylvania. Spring generally generates higher weed competition and, in regions prone to drought, young seedling may succumb to the hot, dry summer conditions.

Proper soil preparation promotes good establishment. Soil tests are necessary to determine pH levels and nutrient needs.

Lime should be added at least six months prior to seeding.

There are two factors that greatly affect successful renovation: seed to soil contact and seeding depth. Planting seeds too deep is the #1 cause of forage seeding failure. The ideal seeding depth is ¼ inch. Seed to soil contact is the second cause of failure. In order to ensure seed germination, the seeds need to be in contact with and covered by soil.

If there is vegetation in the pasture that can compete with new seedlings, the horses should be allowed to graze the grasses as short as possible prior to reseeding. The pasture can also be mowed very short to suppress the existing vegetation. A third option is to use glyphosate herbicide to kill existing plants.

Seed can be randomly applied using a spinner seeder. To ensure seed to soil contact, the soil should be loosened using a spike harrow or set of discs. After broadcasting the seed, the pasture should be lightly harrowed to pull soil over the seeds.



A four-wheeler and spike harrow can be successfully used to prepare the seed bed in small pastures.

Another method of reseeding a pasture is to use a no-till drill. The drill cuts a slit in the soil, drops the seed and covers it with soil.



New forages emerge in rows in a pasture that was reseeded with a no-till drill.

To ensure successful forage establishment, seeds need to be planted less than ¼ inch deep and soil needs to cover the seed, providing seed to soil contact.

Horses will need to be removed from newly seeded pastures until the new plants have at least 5 to 6 inches of growth and the root systems are strong enough to handle grazing pressure. Remember to adopt good management practices to protect the new stand and it will provide nutrition for your horse for many years to come.

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