Proper pasture management leads to high-quality, productive pastures that can supply excellent nutrition for horses.

However, pasture management can be challenging because of continuously 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 (Figure 1). 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.
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.

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 limit the growth of weeds by removing some weed species and reducing the production of weed seeds by others (Figure 2).

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 the plants’ reserves and their ability to regrow. 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.

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 outcompete healthy pasture grasses, but they will quickly take over if the pasture is not managed to ensure 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 continuous problem, herbicide applications may be warranted. However, the use of herbicides alone will not provide a permanent weed control solution. The conditions that caused weeds to proliferate should also be addressed. Reseeding the pasture with desirable forages will hinder the reestablishment 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.

The first step in any weed control program is to identify the specific species of weeds in your pasture. If you decide to use herbicides as a weed management tool, it is very important to apply the right product and plan all herbicide programs wisely. Herbicides must be labeled for use on pastures or for-

Figure 2. Mowing pastures not only encourages tillering but also reduces weed populations by preventing seed head formation and limiting new generations of weeds.
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 suppress 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.

**Pastures Need Rest, Too**

Rotational grazing systems improve 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 allows the horse to remove plants at ground level. Horses tend to graze in the same area repeatedly and on the same plants because of enhanced nutrition and palatability. Repeated intense grazing can damage parts of the plant necessary for regrowth and eliminate plants from the pasture, reducing the quantity of high-quality forage. Therefore, pasture rotation is essential to good pasture management practices.

As stocking density increases, the implementation of a rotational grazing system becomes more important (Figure 5). 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 (Figures 6 and 7).

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 improve the performance of the pasture by allowing longer rest periods for forage regrowth.

**Planned Animal Concentration Areas**

Additional steps may be required to give grasses adequate rest. During hot, dry weather, when cool-season 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 (ACAs; Figure 8). These areas are also known as sacrifice lots, barnyards, exercise paddocks, dry lots, or heavy-use areas.

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 when the number of animals exceeds the ability of the desirable forage in the pastures to survive and recover from grazing. They can also provide turnout for horses with health conditions that prohibit grazing fresh pasture.

The ACA should be sited on high ground at least 100 feet from any wetlands, streams, or ponds. The area should have a slight slope and 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 ACA.

Construction of the ACA should involve excavating the topsoil and covering the area with a layer of stone aggregate topped with a minimum of 2–3 inches of finer stone dust or other footing. The sacrifice area should be surrounded with...
vegetation to filter out any manure and sediment that might run off with stormwater. 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 footing 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 late summer are ideal seasons to plant; however, late summer is usually the preferred seeding time in Pennsylvania. Spring generally generates higher weed competition, and in regions prone to drought, young seedlings may succumb to the hot, dry summer conditions before they are fully established.

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.

Two factors greatly affect successful renovation: seed-to-soil contact and seeding depth. Planting seeds too deep is the number-one 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 a thin layer of 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 before seeding.

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 can be lightly harrowed to pull soil over the seeds and rolled to press them in.

Another method of reseeding a pasture is to use a no-till drill (Figure 9). The drill cuts a slit in the soil, drops the seed, and covers it with soil. The drill must be calibrated to ensure that seed is not planted too deep.

Horses will need to be removed from newly seeded pastures until the new plants have at least 5 to 6 inches of growth and their root systems are strong enough to handle grazing pressure. Repeatedly allowing the new seeding to grow to 6 or more inches and then mowing it will help to thicken the stand before grazing. Remember, adopting good management practices to protect the new stand will provide nutrition for your horse for many years to come.
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