

Horse Pasture Management: Species Selection

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Horse property owners are continuously confronted with pasture management decisions that ultimately affect the productivity, persistence, and appearance of their pastures. An understanding of pasture species, growth habits, and specific growing conditions is required for proper species selection and management.

First and foremost, an assessment of soil drainage, intended grazing pressure, and production goals are necessary. This information will aid in making decisions about the types of grasses and legumes that can be planted for optimum pasture production. Realize that species selection is not the only factor influencing production success, but is the foundation upon which productive pastures are based. Finally, how the pasture is utilized (continuously grazed, rotationally grazed, or exercise lot) must be considered to determine production limits.

Soil Drainage

Soil drainage is an important consideration when selecting pasture species. Certain species can tolerate wet soils while others cannot. Planting pasture species not adapted to soil drainage will most likely produce disappointing results. While it is possible to improve soil drainage by installing a tile-drainage system, it is expensive. It is more cost-effective to purchase the seed of species that are tolerant of wet soils. Determining the soil type and soil drainage characteristics will help you in selecting adapted species. This information is available from your county soil survey.

The landscape position and texture of a soil are primarily determinants of drainage. Soils typically having high water retention are fine-textured soils or shallow soils with underlying shale or other bedrock that restricts water movement downward. A shallow groundwater table may

cause seasonal wetness. If a pasture is very wet, it should be abandoned for grazing unless installation of a tile drainage system is feasible. Pasturing animals on wet sites with little vegetation has the potential for non-point source pollution from excess nutrients in manure.

If soils are droughty, such as coarse-textured soils, forage species that tolerate dry soil (conditions *opt.*) should be selected.

The organic matter content of a soil is an additional factor determining water retention. Organic matter increases the water holding capacity of a soil. (This is particularly important with regard to manure management *opt.*) Therefore, application of organic materials such as manure, will increase water holding capacity of a soil. This is usually beneficial in coarse-textured soils, but may exacerbate wetness problems in other soils.

Grasses

Grasses are the mainstays of horse pastures. Table 1. lists recommended grass species adapted to New Jersey growing conditions. They are all cool-season grasses, as opposed to warm-season grasses. Cool season grasses, such as Kentucky bluegrass, perennial ryegrass, and tall fescue, are most commonly grown in New Jersey, as they thrive in temperate climates. Most of their growth occurs in the early spring and late fall when temperatures are cool, and productivity decreases during hot summer weather. In contrast, warm-season grasses usually have a tropical origin and are most productive in the hot summer months; their main disadvantage is that they are often less hardy and can winter-kill. Cool season grasses also vary in cold hardiness. Susceptible species often winter-kill when exposed to below-normal winter temperatures.



Table 1. Characteristics of Cool-Season Perennial Grasses

Grass	Seedling Vigor	Tolerance to Soil Limitations			Winter Hardiness	Tolerance to Frequent Grazing*
		Drought	Wet	Low pH		
Kentucky bluegrass	M	L/M	M	M	H	H
Orchardgrass	H	M	M	M	M	M
Perennial ryegrass	H	L	M	M	L	M
Reed canarygrass	L	H	H	H	H	M
Smooth brome	H	H	M	M	H	L
Tall fescue	H	M	M	H	M	M
Timothy	M	L	L	M	H	L

H=high, M=medium, L=low

* Frequent grazing refers to any grazing system that provides the recommended 3 week rest period between grazing events.

In addition to winter survivability, Table 1. provides information on seedling vigor. The higher the vigor, the more rapid the germination and establishment of the species. The tolerance of the species to droughty or wet soil conditions, and to low pH (soil acidity) are also listed, as is tolerance to frequent grazing.

Although commonly recommended throughout the northeastern states, timothy and smooth brome are probably not good choices for horse pastures unless a regular schedule of pasture rotation is practiced, because they do not tolerate frequent grazing. Reed canarygrass tolerates wet soils, but even the new low-alkaloid varieties are not as palatable as other pasture species. Orchardgrass tolerates frequent grazing better than smooth brome and timothy, is high yielding, and establishes quickly. It is usually recommended with Kentucky bluegrass and white clover. Perennial ryegrass can be substituted for orchardgrass, but because it is not winter hardy, re-seeding each spring will

probably need to be practiced in more northern locations.

Legumes

Legumes are a family of plants that include alfalfa, birdsfoot trefoil, and clovers. Table 2. lists recommended legume species for New Jersey, and provides information on seedling vigor, tolerance to soil moisture, and low pH. Potential for frost heaving, persistence, and tolerance to frequent grazing are also listed.

Legumes provide a good source of protein and calcium, as well as nitrogen to the pasture through nitrogen fixation. Common white clover and Ladino white clover are the most popular legumes for horse pastures. Although alfalfa is commonly recommended, it is seldom found in pasture mixes. Red clover is also commonly recommended but most horse owners avoid it because it can cause the slobbers. Slobbers or excessive drooling is

Table 2. Characteristics of Perennial Forage Legumes

Legume	Seedling Vigor	Tolerance to Soil Limitations			Heaving Potential	Persistence	Tolerance to Frequent Grazing*
		Droughty	Wet	Low pH			
Alfalfa	M	H	L	L	H	H	L
Birdsfoot trefoil	L	M	H	H	L	M	M
Red clover	H	L	M	M	M	L	M
White clover	M	L	H	M	L	H	H

H=high, M=medium, L=low

*Frequent grazing refers to any grazing system that provides the recommended 3 week rest period between grazing events.

caused by an alkaloid (*slaframine*) found in red clover. Birdsfoot trefoil is another recommended legume, but it is not commonly included in pasture mixes. It tolerates wet soil conditions better than alfalfa or red clover—but is more difficult to establish and does not tolerate frequent grazing as well as the white clovers. Usually, the clover component in pasture seed mixes is low. Clover seed in the soil will also germinate and contribute significantly to pasture productivity.

Stocking Density and Grazing Pressure

If the amount of pasture is limiting, stocking densities are high, or rotational grazing is not practiced, species that tolerate frequent grazing are essential. Pasture grasses and legumes have different abilities to recover from grazing. Species that have growing points underground tolerate frequent grazing better than those with growing points above ground. Kentucky bluegrass always maintains storage and growing points underground, while timothy and smooth brome grass have aboveground growing points at certain growth stages. If these species are grazed while their growing points are aboveground it will damage and eventually kill them. White clover tolerates frequent grazing but has a low tolerance to drought. Tall fescue is fairly tolerant of frequent grazing and can withstand trampling.

Research on horse pastures in New Jersey has indicated that most are overstocked. Therefore, tolerance to frequent grazing is most often the critical criterion for horse property owners when selecting species for pasture establishment or renovation. Consequently, it is not surprising that Kentucky bluegrass and common white clover are the two most abundant species in horse pastures.

Seeding Mixes

A common seeding mixture in the northeastern states contains Kentucky bluegrass, endophyte-free tall fescue, and white clover. This is a mix that performs well, unless site-specific pasture conditions limit the use of these species. Kentucky bluegrass and white clover both tolerate frequent grazing but are sensitive to dry soil conditions. Tall fescue tolerates dry conditions better than Kentucky bluegrass or white clover. Tall fescue is often avoided by horse owners because it may not be as palatable as other grasses and may be infected with an endophyte that affects pregnant mares. Pregnant mares should be removed from endophyte-infected tall fescue pastures during the last 3 months of gestation. Endophyte-free tall fescue varieties are commercially available for pasture use. Endophyte-free tall fescue plays a major role in horse pastures in adapted areas and with proper management can provide an excellent source of forage for horses. More recently, endophytes have been introduced to perennial

ryegrass cultivars. Consequently, if purchasing perennial ryegrass, make sure you buy endophyte-free cultivars.

Conclusion

Establishing or renovating pastures can be expensive, so collecting more information before making a decision increases the potential for success. Pasture seed mixes should contain species whose characteristics complement one another. Consult with your county agricultural agent or other RCE fact sheets on equine pasture management.

Definitions:

Alkaloid: Any of numerous usually colorless, complex, and bitter organic bases containing nitrogen and usually oxygen.

Endophyte: A microorganism that lives at least part of its life cycle within a host plant, as a parasite or symbiont.

Nitrogen fixation: The metabolic assimilation of atmospheric nitrogen into ammonia by soil microorganisms and especially rhizobia.

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