

## **HORSE PASTURES FOR TEXAS**

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In the natural setting, the horse is a nonruminant herbivore and grazes high quality forage to supply daily nutritional needs. High quality forages provide energy, protein, vitamins and minerals for horses. Older horses with fully developed digestive tracts utilize forages more efficiently than younger horses; however, younger horses must consume forage for maximal development of the gastrointestinal tract. Nutrient requirements of horses vary, and all horses need high quality forage in the daily diet to prevent digestive disturbances. While hay is traditionally fed to confined horses, pasture can be used to provide forage economically in the daily diet and in a healthy environment.

Traditionally, only larger farms develop pasture programs, but horse owners with small acreage can also establish and effectively utilize pastures in equine feeding management programs. It is fortunate that in Texas there is a wide variety of forages that can be grown during different periods of the year to furnish grazing on a year-round basis. By using the proper combination of different forages, horses can be successfully pastured most of the year. Using a combination of forages complicates pasture management, but it allows the horseman to provide sufficient high quality forage necessary to meet all or most of his horses' nutritional requirements.

This publication provides helpful suggestions for establishing and utilizing pastures in either large or small horse operations.

### **ADAPTED SPECIES**

#### **Perennial Warm-Season Pastures**

Texas has an abundance of perennial warm-season pasture grasses. Although native grasses provide considerable pasturage, improved pasture grasses provide forages for larger numbers of livestock on limited acres. These improved pasture grasses include Dallisgrass, common bermudagrass, Bahiagrass, Coastal and other improved bermudagrasses, Kleingrass, many species of introduced bluestem grasses and buffelgrass. Under moderate fertility and management conditions, these grasses provide forage from late spring through the fall. Since these grasses do not field-cure well, hay must be made during times of excess forage production

for later feeding. Recent Texas A&M Veterinary Diagnostic Laboratory experience suggests an association of liver damage in horses on pure Kleingrass diets.

#### **Annual Warm-Season Pastures**

Limited types of annual warm-season or temporary pastures can be grown in Texas. Millets, hybrid sudans, hybrid sorghums and hybrid sudan-sorghum crosses are available from most seed companies. While many horses in Texas and the Southwest have been grazed on these grasses with no apparent problems, the Texas A&M University Veterinary Diagnostic Laboratory indicates that horses grazing sorghum, sudans or sorghum-sudan crosses or horses fed green chop or hay from these plants, grown under certain environmental conditions, have the potential for developing sorghum cystitis. This condition is characterized by urinary tract problems and loss of control of rear quarters. The main advantage of annual warm-season pastures is they produce a large volume of high quality forage over a short period.

#### **Perennial Cool-Season Pastures**

Only a limited variety of perennial or permanent cool-season grasses can be utilized in Texas. In the west and northwest section of the state, tall wheat grass is forage that can provide high quality pastures for horses. While this is a cool-season perennial grass, the extremely low temperatures of mid-winter make it a major producer during the late winter, spring, early summer and then again in the fall and early winter. In high rainfall areas of the state and under irrigation in other parts of the state, tall fescue is a perennial cool season grass that can provide high quality forage in large volumes from fall through early summer. Recent research documents the presence of a seedborne fungal endophyte and has been suspected of being linked to problems with pregnant mares (i.e. abortions, prolonged gestations, retained and/or abnormally thick placentas, agalactia, etc.)

Studies by the Universities of Missouri and Kentucky have documented the presence of a fungal endophyte in fescue which is associated with the reproductive problems. It should be noted that fescue is a problem only to gestating mares with no problems

to other classes of horses. In addition, not all fescue carries this fungus and, even within a field, some areas can be a problem with other areas being clean. If fescue is utilized and problems are suspected, the following is recommended:

- ! Remove pregnant mares from fescue pastures and hay 90 days before foaling.
- ! Monitor udder development (if no enlargement two weeks before foaling, suspect problems).
- ! Be present at foaling to help foals break out of the tough placentas.
- ! Have colostrum and milk replacer on hand to feed foals.

Commercial laboratories can test for presence of the fungus in pasture plants and hays. Seeding fungal-free seed and/or legumes in pastures also helps minimize potential problems. Fescue can be useful either as a pasture or a hay plant for high quality grazing or hay.

### **Annual Cool-Season Forages**

A wide variety of annual, cool-season forages are grown in Texas. These are wheat, oats, barley, cereal rye, triticale and rye grass. All of these annual varieties require seeding each fall. They are, therefore, relatively expensive because of the establishment cost, but they produce the highest quality forage available for horses during the fall, winter and early spring months. They can be used for pasture or as high quality hay. These cool-season, annual pastures can be either seeded on prepared seedbed or sodseeded into established warm-season perennial pastures to extend the green grazing period of any area.

### **Legumes**

Legumes are useful for increasing the quality of available pasturage or for extending the green grazing period of a pasture. Since only a limited number of warm-season legumes are available, most of the emphasis in Texas has been on cool-season legumes over-seeded on warm-season pastures. The more common legumes used in Texas pastures are white clover, Yuchi arrowleaf clover, Mt. Barker subterranean clover, Crimson clover, vetch and the sweet clovers. Button and burr clovers proliferate over much of the state as naturalized natives. Alfalfa can be useful as a pasture, but its primary use in Texas is as a hay crop. Efforts are being made to develop a new variety of red clover, a warm-season clover, that could

be grown in Texas.

## **LAND PREPARATION AND PLANTING**

Establishing permanent pastures is much like establishing a row crop. Soil preparation for planting is of prime importance. Thoroughly deep-plow the soil to bury trash and weeds to prevent their germination and to disrupt any hard pan or plow pan that might exist. Further disking and harrowing or dragging form the type of planting seedbed needed. A weed-free firm, moist seedbed is important in establishing pastures whether from seed or from sprigs.

Most of the improved bermudagrasses available today must be planted from vegetative materials that are transplanted since they do not produce viable seed. Keep the vegetative material cool and moist to avoid drying out and dying. Plant these materials in moist soil as rapidly as possible after they have been dug. Then refirm soil around this material by rolling to keep it from drying out and the grass dying.

Plant seeded grass species at the time and rate recommended for your particular area. Plant on a clean, firm, moist seedbed and roll or cultipack to firm the soil and seed together. Firming or cultipacking conserves moisture and encourages faster seed germination. Generally soil temperatures must be higher for species started from seed than from vegetative propagation.

Perennial grasses grow slower than annuals and require more time to become fully established. Climatic conditions primarily determine this, but many times perennial pastures require most of the first year to become adequately established and may produce limited grazing or hay production.

## **FERTILIZATION**

To obtain high yields of good quality forage, fertilizer is required on improved pastures. Fertilizer requirements vary greatly throughout the state. All areas require nitrogen while some areas in Central and West Texas do not require phosphorus and potassium. Some areas, such as East Texas, require nitrogen, phosphorus and potassium as well as the addition of lime for maximum growth.

Base fertilizer usage on a recent soil test which indicates the soil's nutrient status, especially regarding phosphorus and potassium needs. It is

important to know if nutrients are needed so they can be supplied in adequate amounts. When submitting soil samples for testing and fertilization recommendations, producers should indicate the forage to be grown and the per acre production level desired. Such information is necessary as a basis for valid fertilization and lime recommendations.

If soil requirements are unknown, find out by having a soil sample analyzed. This is done by collecting random samples of soil throughout the pasture area. Collect samples to a depth of 6 inches using a soil probe or shovel. Mix this in a bucket and send a single sample from this mixture to a soil lab for analysis. Soil sample boxes, information sheets and sample-taking directions are available from any county Extension office. Recommendations from the Texas A&M Soils Lab are given to meet production requirements for whatever grass species you have planted. The following table gives fertilizer application rates needed for growing enough grass forage for approximately one horse per acre according to various soil tests.

Soil Test Level	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Very low	140	60	100
Low	140	40	60
Medium	120	30	40
High		0	0

In establishment, apply and incorporate all needed fertilizer, except nitrogen before planting. Apply only 40 pounds of actual nitrogen preplant. Apply the rest after the pasture is established. Adding phosphorus preplant is very important as it stimulates root growth and aids in root development for faster establishment.

Established grasses should receive a complete fertilizer analysis in the spring as indicated by the soil test. Make additional nitrogen applications alone several times throughout the growing season as climatic and growth conditions dictate. For example, if a soil test indicates a need for 140 pounds nitrogen, 40 pounds of phosphorus and 40 pounds of potassium, the first application could be applied as 40-40-40. The remaining 100 pounds of nitrogen could be applied as two other applications of 50 pounds each. This insures good growth and quality throughout the season.

! Apply nitrogen fertilizer at rates of at least 50

to 60 pounds of actual nitrogen per acre. Rates lower than this are inefficient in improving yields and protein content. Higher rates are especially important where hay is to be harvested to obtain fast growth, early harvest and high quality.

! Time fertilizer applications, especially nitrogen, to stimulate growth according to seasonal forage needs with consideration of expected moisture availability.

! Along with fertilizer use to increase production, give close attention to forage utilization and management. Group horses according to their nutritional requirements and allow them access to the quality of forage needed. Harvest hay from excess pasture growth during seasons of favorable moisture and growing conditions. Dividing large pastures into smaller areas facilitates use by different classes of horses and is helpful in hay harvesting, fertilization and total management and utilization control.

## HAY PRODUCTION

For hay production, a balanced fertilizer in the spring with nitrogen applications following each cutting are required for top production and quality. In sandy soils, potassium fertility is almost as important as nitrogen fertility in maintaining a productive forage stand. Apply adequate amounts of potassium all at one time in the spring or in split applications like nitrogen throughout the growing season.

Hay can be made from almost any type of forage grown, whether it is grass or legume. The basic principle behind good, high quality hay production is to cut the plant at a growth stage when it is high in protein and high in digestibility. Age of the plant is the prime factor that determines plant digestibility. All grasses and legumes are high in quality until the plant starts seedhead formation. Once this starts, the plant changes its style and growth. New leaf development ceases, and the plant starts forming a seed stem and seedhead. At this point the plant starts building fiber, thus digestibility and percent crude protein start declining. Any plant that goes to full seedhead is considerably lower in protein and digestibility than it would be if cut in the boot or early head stage. This principle of plant age has more

**Effect of Frequent Cutting on Yield and quality of Coastal Bermudagrass Hay  
(Georgia Coastal Plains Section)**

<b>Clipping Frequency (weeks)</b>	<b>Tons/acre</b>	<b>Percent Crude Protein</b>	<b>Percent Crude Fiber</b>	<b>Percent Leaf</b>
3	9.7	19.0	27.7	86.0
4	10.0	16.9	29.5	83.0
6	11.9	13.6	33.2	62.0
12	11.6	9.7	35.0	51.0

to do with plant quality than does the fertility program.

Fertility is the prime requisite for high production in a hay-making operation. Almost any forage plant responds to moderately high fertility levels with increased production. Fertility increases the amount of protein in the plant and total pounds of protein per acre. But the effect of fertility on protein is not as important as is plant age. In Coastal bermudagrass cut at the same stage, 50 pounds of nitrogen per acre may produce 8 to 9 percent protein hay, while 400 pounds of nitrogen per acre may produce only 12 to 13 percent protein hay. This may vary considerably, depending on growth stage.

**Effect of Different Nitrogen Rates on Yield and Protein Content of Coastal (Texas A&M)**

<b>LB/N/Acre</b>	<b>Yield In Tons</b>	<b>Protein</b>
0	2.67	7.9
100	4.38	9.1
200	5.93	10.5
400	8.59	11.7
600	10.65	12.4

Fertility has a much higher impact on total production per acre. Any grass responds to higher nitrogen rates. Coastal bermudagrass will produce from 12,000 to 14,000 pounds of hay per acre with approximately 300 pounds of total nitrogen per acre. The relationship between production and fertility is almost direct as long as growing conditions are adequate. Producing large amounts of hay per acre is only possible where a good fertility program is followed.

**WEED CONTROL**

Weeds can affect whether or not pastures become established. Weeds deprive new plantings of nutrients and moisture, retard growth and completely crowd out new stands. Good seedbed preparation and use of high quality, weed-free seed are helpful practices in establishment. Broadcast or close drill plantings retard weed growth through shading. In spite of all precautions taken, weeds can still be a serious problem.

Control weeds either chemically or mechanically. Chemical weed control is usually more effective and gives longer control than shredding or mowing. In some instances, however, chemical weed control is not safe or practical so mechanical control becomes necessary. This can be done with a power shredder or mower. Use care so that young plants are not damaged by clipping too closely. After stands are established, close clipping removes unpalatable, mature plants. This allows high quality regrowth for horses.

Clip weeds at the right time. Clip perennial weeds before budding and annual weeds before seed formation for better control in keeping pastures from becoming reinfested longer.

Chemical weed control is effective and a good management tool if used wisely and safely. Always follow label directions and use at recommended rates.

**MANAGEMENT CONSIDERATIONS**

Primarily due to higher leaf-to-stem ratio, actively growing forage is higher in energy and protein and is more palatable than older, mature forage. Therefore, horsemen should use management techniques to maintain uniform young growth as follows:

- ! To maintain young growth when pasture is rapidly growing, increase the stocking rate. Graze each pasture grass to a designated ideal height (i.e. Coastal bermudagrass - 2 inches). Grazing closer than the recommended height damages the plants, and horses grazing close to the ground pick up more parasite eggs. If pastures cannot be grazed to the recommended height, shred pastures or make into hay.
- ! Horses have characteristic ingestive and eliminative behavior patterns in that they graze immature plants close to the ground, and they do not graze in areas where they defecate. This spot grazing wastes forages; therefore, spread manure routinely during the grazing period. This is easily done by dragging with a chain-link or spike-tooth harrow. Mowing also removes clumps of tough unpalatable forage and allows more uniform regrowth. Alternating or mixing cattle and horses on a pasture is also a good practice because cattle eat some of the mature grass. This system helps reduce internal parasite infestation in a pasture since cattle parasites are not harmful to horses and vice versa.
- ! Horses maintained in small pastures trample and/or destroy a large amount of forage. Horses maintained in stalls and turned out to exercise in pastures do likewise. Both situations are obviously worse in wet weather. Minimize pasture damage by keeping horses off of smaller pastures where feasible and limit grazing to a few hours each day or night. Horsemen should also practice protective grazing by exercising stalled horses before turning into a pasture, thus minimizing forage damage.
- ! Horse pastures should be free from pits, holes, stumps, high line wires and other hazards. Chewing on trees is a common problem when trees are in a pasture. To prevent girdling and eventual death of trees, wrap trees loosely with close knit, wire fencing.

**FORAGE SPECIES FOR TEXAS**

Plant	Soil Adaptation	Planting Date	Remarks
<b>Warm-Season Perennial Forages</b>			
Bahia Pensacola	Best on sands to clay east of the Colorado River.	10-15 lb seed/acre. Plant in spring or early fall.	Slow to establish but makes thick sod when well established.
Bermuda Common	Best in sandy loams and loams with fair to good drainage.	2-4 lb hulled: 20 bu of sprigs per acre. Plant in spring.	Usually comes in naturally in sandy soils with improved fertility.
Bermuda - Improved Coastal Callie Alicia Tifton-44 Brazos Many others	Best on sandy loams and loams with fair to good drainage.	All vegetative propagated by planting sprigs at 18-20 bu/acre in late winter or spring. Best to plant during dormant stage.	High production potential and carrying capacity with good management and fertility.
<b>Bluestem</b> - Introduced Angleton Gordo Medio King Ranch Cancasium Kleburg Pretoria 90	Wide adaptation of soils. Best on clays to loams. Angleton, Gordo, Medio and Pretoria 90 are limited in area due to winterkill.	1-2 lb Pure Live Seed (PLS)/ acre depending on selection. Plant in spring.	Marginal quality. Production depends on selection.
Buffelgrass Common Higgins Nueces Llano	Wide adaptation on permeable soils in South Texas. Best on sandy loams.	1-2 lb PLS in rows: 2-4 lb broadcast on well prepared seedbed. On root plowed ground, use 6-8 lb PLS. Plant shallow in spring.	High Yield potential. Drought resistant.
Dallisgrass	Sandy loams to clays	3-4 lb PLS Plant shallow in late winter or early spring.	Seed quality usually low. Ergot-infested seedheads may be toxic so should be mowed.
Johnsongrass	Sandy loams to clays.	10 lb per acre in rows; 25 lb per acre broadcast. Drill or cover 1 inch in spring.	Requires careful management to maintain a stand. Has prussic acid potential.
Kleingrass Selection 75 Verde	Sandy loams to clays.	In rows 1 lb PLS: broadcast 2 lb per acre. Plant shallow in spring and roll seedbed.	Central and West Texas. Good quality forage. Seedling growth slow. Association of liver damage in horses on pure Kleingrass diet.
<b>Lovegrass</b> - Weeping	Sands and sandy loams. Well drained soils.	In rows, 1 lb per acre; broadcast 2 lb per acre. Plant shallow in spring and roll seedbed.	Best utilized in early spring and fall. Older growth low in quality and palatability.
Common			
Ermelo			
Morpa			

**FORAGE SPECIES FOR TEXAS (CONCLUDED)**

Plant	Soil Adaptation	Planting Date	Remarks
<b>Warm-Season Perennial Forages (Continued)</b>			
Native grasses	All soil types.	Plant in spring. Commonly planted mixture is Bluestem mixtures and/or sideoats grama.	Low production. Fair quality.
<b>Warm-Season Annual Forages</b>			
Sudans Sorghums Sudan-Sorghum X's	Sandy loams to clays.	Plant 35-50 lb per acre in April-June.	High production good quality. <u>Not recommended for horse pastures.</u> Cystitis syndrome.
Millet	Sandy to sandy loams.	Plant 25-30 lb per acre in May June.	High production: good quality/nitrate buildup possible.
<b>Cool-Season Perennial Forages</b>			
Fescue	Loams to clays. Well adapted to bottomlands and wet soils.	Fall plant 15 lb per acre. Broadcast or drilled. Plant shallow and roll seedbed.	Good quality forage. Fescue toxicity. Plant only fungus-free seed.
Tall Wheatgrass - Jose Largo Others	Loams to clays. West Texas and to the High Plains.	Fall plant 8 to 12 lb per acre. Plant shallow.	Use in pure stands. High quality grazing.
<b>Cool-Season Annual Forages</b>			
Barley Oats Rye Wheat Triticale	Wide soil adaptation.	On prepared seedbed plant 100 lb per acre in early fall (Sept.). For sod-seeding, remove stubble and plant 120 lb per acre in late Sept. or early Oct.	Many varieties of each species. Always high quality until seedhead forms.
Ryegrass	Sandy loams to clays. Does well on wet soils.	Plant 15-20 lb per acre in Sept. or early Oct.	Several varieties. Always high quality until seedhead forms.
<b>Legumes (Inoculate all legume seed before planting)</b>			
Alfalfa	Sandy loams to well drained clays. Neutral to alkaline soils.	15 lb per acre. Fall planting preferred. Spring planting may have heavy weed problem.	Throughout Texas.
Arrowleaf Clover	Well drained sands to loams. Neutral pH.	6 lb per acre scarified seed. 10-12 lb per acre of non-scarified seed in Oct.	Central and East Texas. Long spring and early summer growth period.
Crimson Clover	Sandy to sandy loams of East Texas. pH of 6.5 to 7.5 desired.	15-20 lb per acre late Sept.-Oct.	East Texas. Defer grazing during flowering for reseeding.
Subterranean Clover	Sandy loams to well drained clays.	12 lb per acre in late Sept.-Oct.	Pasture only. Very good reseeding ability under constant grazing.
Sweet Clover	Loams to clay. Neutral to alkaline soils. Well drained.	12-15 lb per acre in late Sept.-Oct. or late Feb. or March.	Throughout Texas.
Vetch	Well drained loams to clays.	25 lb per acre Sept.-Oct.	Large seed. Planted with small grains to a large degree.
White Clover (and Landino Clover)	Loams to clays.	3 lb per acre Sept.-Oct.	Gulf Coast and bottomlands of East Texas.

## **NOTES**

