

Forage-Livestock Research Progress Report

Texas A&M AgriLife Research and Extension Center
at Overton



Research Center Technical Report 2018-1

365 - Day Grazing Systems: Matching Warm-Season Perennial Grasses with Cool-Season Annual Forages

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Cattle have many predictable behavioral traits, and one of them is... “they search for, and consume forages everyday... for 365 days a year.” Searching and consumption of forage successes for cattle are linked to Vegetation Zone, environment, and management strategies. Although warm-season grasses (C_4) may be found northward to about 55° N Lat in North America (Canada border) to 40° S Lat in South America, most of the warm-season perennial grasses are found between 30° N Lat and 30° S Lat of the equator (Warm-Season (C_4) Grasses 2004). Warm-season perennial grasses are the primary forages for introduced pastures and native rangelands in Texas. This is the “Good News” since these grasses are the most persistent and sustainable forages found on grazinglands. The “Bad News”, however, is that the warm-season perennial grasses do not have much, if any, forage growth during the winter months after frost. Figure 1 shows an average of the frost-free days and the duration of frost days in Texas and the Southeast US. Regardless of pasture location in Texas from the Gulf Coast to the Rolling Plains and the High Plains, there is a period of time during late-fall and early-winter in which cold temperatures terminate active growth of warm-season perennial grasses (Fig 2). Thus, the frost-free, active growing period could range from 180 to 300 days per year. The dormant, deferred period could range from 0 to 180 days, and this is the time period that requires diversity of forages for pastures.

Extending the Grazing Period

Managers should remember that more than one pasture, and generally multiple pastures, are necessary to support different animal and forage species-functions during different months-seasons. The question of what forage-pasture management strategies may be implemented to extend the grazing period for cattle during the winter period may be answered with some of the following options:

- Use stockpiled warm-season perennial grass for cattle to graze after frost and until new growth is generated in spring (Fig 2). The feasibility of using only stockpiled grass is environment- and forage-dependent. For bermudagrass pastures, for example, grazing and use of stockpiled forage usually extends only until late-December to early-January. The duration of grazing period is a function of variety, forage mass, and climatic conditions (rainfall after frost). The more upright growth varieties such as ‘Tifton 85’ bermudagrass is a much better option for stockpiling compared to common bermudagrass. In addition, Tifton 85 has the highest nutritive value of all other bermudagrasses.
- On rangeland, climatic conditions may not be conducive for establishing cool-season annual forages nor for the use of hay. However, there is a diversity of warm- and cool-season forages and browse on rangeland for grazing after frost. In the more humid

vegetational zones of Texas, both stockpiled forage and hay have become standard management practices to supply daily forage, and to avert risk of having no forage for cattle to consume. Many managers want a hay-free system for cattle. However, many producers who have flood and windstorm insurance on their homes also have access to hay to reduce risk, prevent selling of breeding stock, and provide a reliable year-round pasture-cattle system. Thus, some of the “best insurance” for a cattle operation is to have some “hay-on-hand”.

- Use a cool-season perennial grass such as Tall Fescue to provide active grazing forage during late fall-winter-early spring. In general, Tall Fescue and any other cool-season perennial grasses are best adapted to areas north of Interstate 20, and those areas primarily bordering the I-30 and I-40 corridors (Zones 6 and 7; Fig 1). The use of Tall Fescue in Texas in the past has been restricted due to: 1) reduced adaptive and sustainability in most vegetational zones; 2) ‘Kentucky 31’ Tall Fescue is the most persistent tall fescue variety; however, it is usually infected with an endophyte that causes Fescue Toxicosis; 3) The “novel endophytes” in new varieties of Tall Fescue that reduces or eliminates toxicosis have not shown to promote sustainable fescue stands, and have not proven to be persistent and reliable; and 4) combining clovers with Tall Fescue is management-intensive and has had limited success in Texas due to competitive effects of the grass stand for clover establishment. Thus, Tall Fescue has not been generally recommended as part of a 365-day grazing system for most of Texas pastures.
- Establish small grains such as wheat, oats, or rye on prepared seedbed pastures for fall-winter-spring grazing (Fig 2). For sod-seeded pastures, small grains with or without annual ryegrass is generally not available for grazing until mid-December to mid-January. However, small grain with ryegrass has extended grazing until early- to mid-May.
- Use annual tetraploid ryegrass such as, ‘Nelson’ or ‘TAMTBO’ on prepared seedbed for grazing in late November to early December and throughout winter-spring until mid- to late-May. Sod-seeded annual ryegrasses are generally not available for grazing until late January to mid-February, and are dependent upon Vegetation Zone, time of planting, and nitrogen fertilization. A best management stocking strategy for the abundance of forage produced from sod-seeded ryegrass in the spring is to increase stocking rate and/or prepare to make baleage or hay. This stocking strategy allows the warm-season perennial grass (bermudagrass or bahiagrass) to make the active-growth transition into mid- to late-May without unfavorable competitive effects from ryegrass.
- Sod-seed annual clovers (crimson, arrowleaf, ball, white, etc), or allow for reseeding into bermudagrass or bahiagrass sod. In Hardiness Zone 8, for example, fall-planted clovers will not be available for full-time grazing until late-February to mid-March (Fig 2). Most clovers will terminate growth from early May (Crimson) to mid-June (Arrowleaf). White clover, however, can provide some intermittent grazing into the summer months, depending upon rainfall.

Management Strategies and Costs of 365-day Grazing

Regardless of the Vegetation Region or Hardiness Zone, most managers-landowners know the opportunities and obstacles associated with seasonal forage production attributes, and whether or not a 365-day grazing period may be achieved on their pastures using one forage or multiple

types of forages. Some of the questions, concerns, and management strategies to consider for year-long or 365-day grazing may be included as follows:

- What is the active growing period (months) for the base warm-season perennial grasses on the property? Refer to Figure 2 for example of Hardiness Zones.
- What other warm-season annual or perennial grasses fit into a specific Hardiness Zone and that complements and/or offsets the forage production seasonality effects?
- How many pastures may be needed to regulate stocking of warm-season perennial grasses, stockpiling, and provide for flexibility for establishment of other forages on prepared seedbed or sod-seeded?
- Which small grain types are best adapted to existing Vegetational Zone, Hardiness Zone, soil, pH and fertility, drainage, and forage production during fall, winter, and spring?
- Is prepared seedbed for small grains or a tetraploid ryegrass a reality or perception on existing property?
- With estimated requirements for site preparation, establishment, and fertilization of small grain pastures, does the additional, high quality forage for grazing fit the existing calving season and/or stocker operations?
- Some estimated costs for small grain pastures includes: a) site preparation and planting @ \$25/ac; b) small grain seed planted at 100 lbs/ac \approx \$40/ac; c) minimum of 2 applications of nitrogen fertilization @ \$60/ac; d) without addition of ryegrass, prepared seedbed small grain costs will approximate \$125 to \$175/ac, and the total costs depend on fertilization regimens and inclusion of annual ryegrass (\$15/ac).
- Stocking rate and estimated costs per cow for small grain and ryegrass varies with vegetational zone and fall-winter rainfall, time of establishment, soil fertility and N-fertilization, body weight and class of cattle, and expectations of animal performance. For cows and calves, fall-calving (Sept-Nov) is best suited to match animal requirements with small grain forage production and nutritive value (Crude Protein and TDN). Because the bimodal growth pattern of small grain has a minor production peak in the fall and a major forage production in late-winter and spring, appropriate stocking rates in late-winter to spring (mid-Feb to early May) is often 2 to 3 times the body weight per acre of that for the fall-early winter stocking rate.
- Stocking strategies for fall calvers and small grain pastures varies with need of high quality forage and costs per acre. Under most Hardiness Zone conditions, a cow-calf pair (1500 \pm lbs) may require 2 to 4 acres of small grain pasture under full-time grazing regimens during the fall. With small grain pasture costs at \$150 to \$200/ac, most producers may choose to implement a limit-graze method. For limit-grazing, cow-calf pairs have access to full-time residence on stockpiled warm-season perennial grass, with or without hay, and restricted access (limit-grazing) of small grain for 2 to 3 hr per day each day. This limit-graze stocking strategy will allow for 2 to 3 cow-calf pair/ac of small grain during the fall-winter. In late-winter to early spring, forage production will increase with favorable climatic conditions to allow for full-time stocking of about 1 cow-calf pair per acre. This management option provides for a “cost-sharing” of wintering costs per acre with 2 or more cow-calf pairs.

Forage Diversity

A 365-day grazing program for any location and Hardiness Zone in Texas and other states always requires: a) diversity in forage types (warm-season perennial grasses and cool-season annual grasses); b) multiple pastures to provide for an array of stocking, deferment, prepared seedbed, etc; c) matching calving season with seasonal forage production and nutritive value of forage with nutritive requirements of cattle; and d) an overall forage production-stocking rate-forage utilization management plan that is flexible to adjust to climatic conditions. Diversity in forage types and varieties can allow managers to achieve 365-day grazing. However, the costs associated with a “no-hay” program may fit only a specific niche of calving season and management preferences. A 365-day grazing program without availability of hay may not be a best management option for many due to variation in climatic conditions and the need to implement stocking strategies that minimizes risks.

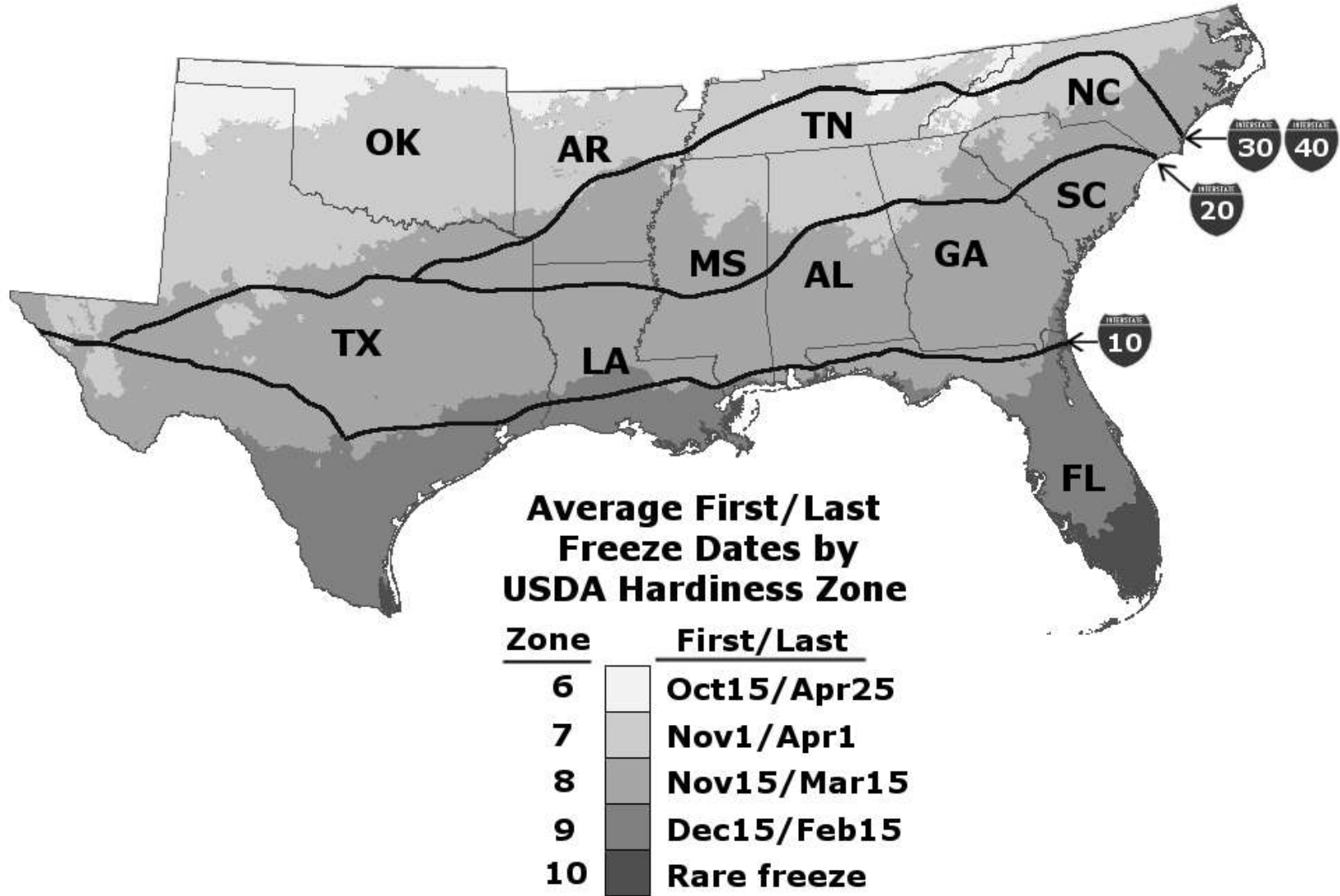


Figure 1. Average first and last freeze dates according to USDA Hardiness Zones.

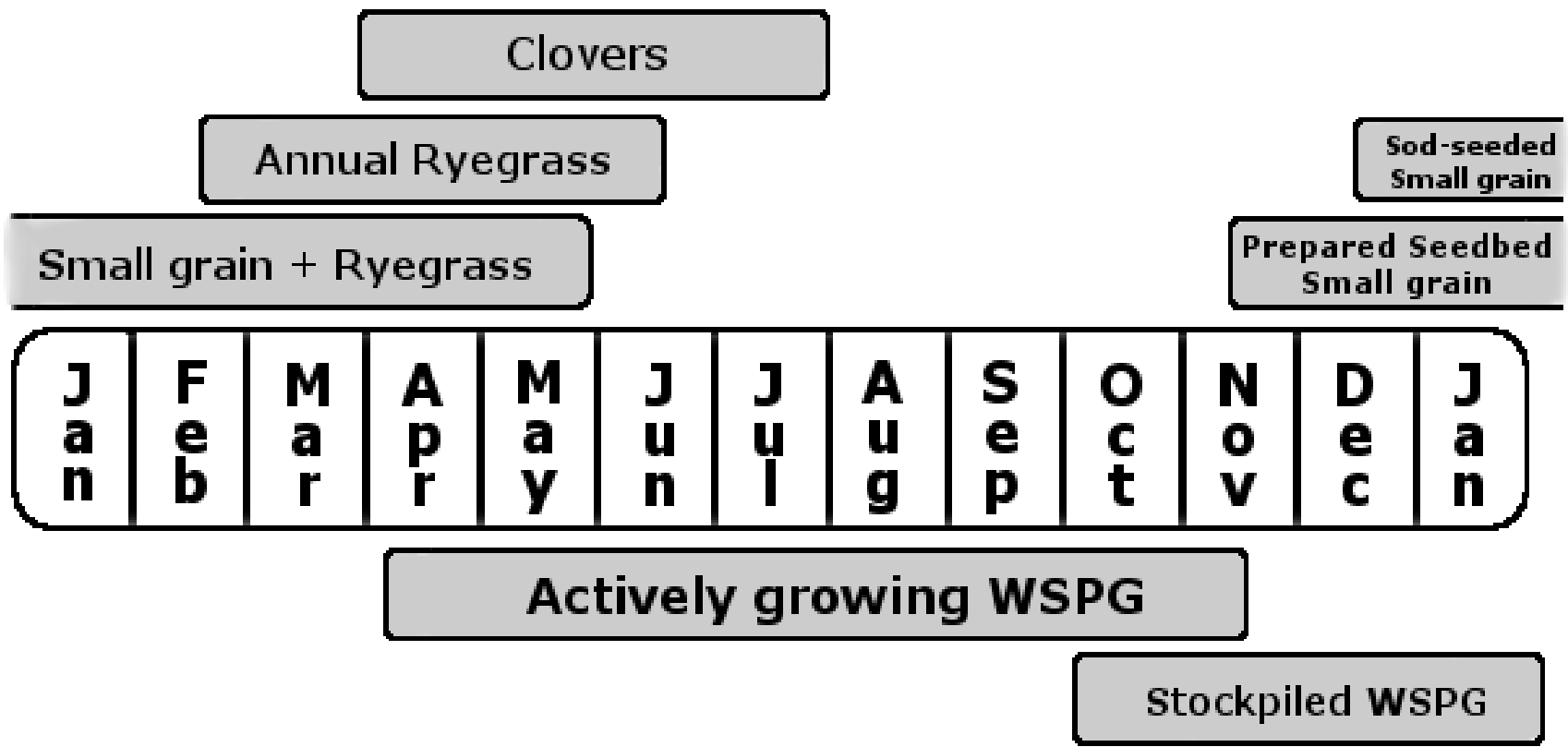


Figure 2. Forage combinations with warm-season perennial grasses (WSPG) for 365-day grazing in Hardiness Zone 8.