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Forage and Pasture Options for Wintering Cattle

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If it wasn't for the wintering period and the need to feed hay…the cattle business would be fun…and more profitable!! The primary forage base for pastures and rangeland in Texas is warm-season perennial grasses. With the drastic changes in climatic-vegetational zones in Texas, there is considerable variation in species diversity and production from these grasses that range from bermudagrasses to native bunchgrasses. However, these grasses are uniquely similar in that they have restricted to non-existent growth after the first killing-frost and during the winter months. Thus, for the cattleman, management strategies for wintering the cow herd must include an array of options for dry matter (DM) and associated costs of the forage and/or pasture.

Class of Cattle and Performance Expectations

All cattle have daily requirements for energy and protein with roughage being the primary source for cattle on pasture and/or rangeland. In order to make biologically productive and economically sound decisions for wintering cattle, the performance expectations must be considered for the specific class of cattle. The daily nutrient requirement for classes of cattle varies with body weight, age, sex, stage of production, and performance expectations. These nutrient requirements are available in tabular format from several printed sources as well as from on-line, web-sites. Although the specifics of meeting an animal's nutrient requirements may require some study and/or evaluation, the "short-cut" answer is that grazing cattle prefer to consume ad libitum quantities of forage. And, the daily DM intake for cattle may vary from less than 2% to nearly 3% of body weight. The extent of intake as a percent of body weight is bounded by availability of forage AND the quality (nutritive value) of the forage. Thus, with knowledge of the nutritive value of the forage, strategies may be developed for a supplement source that can provide energy and/or protein to meet animal requirements and performance expectations.

Forage and Pasture Options

The winter process, duration, and costs are directly related to climatic conditions, primarily rainfall that occurs during the spring-summer months. Although the temperature extremes during the winter are factors for consideration of DM requirements, forages produce DM during summer months that is available for active and deferred grazing in fall-winter. And, hay production is a critically important factor that dictates the flexibility, aversion to risk, and cost of wintering cattle. In the absence of spring-summer rainfall, and to the extent that drought conditions prevail, the costs of "wintering" can also include the "summering" of cattle.

Stockpiled Forage

One of the oldest pasture-rangeland management strategies has been that of stockpiling forage or deferment of grazing during late summer-early fall for subsequent use by cattle after frost occurs. Thus, after frost, cattle may graze these non-active growing forages during late-fall and winter. Although it is obvious, these warm-season perennial grasses do not have active DM production…AND…the quality of the stockpiled grass DOES NOT improve with time. A forage sample for quality analyses is one of the best investments to confirm whether or not supplementation is required. And, if supplementation is required, decisions can be made on whether it be energy-based and/or protein-based.

By estimating available DM per acre by visual, height of forage, or actual measurements using quadrats, management strategies can be developed concerning the expected duration of stocking. Forage utilization and stocking strategies may range from a continuous, non-restrictive access to an entire pasture, or to some rotational, restrictive access to a designated portion of the deferred area. With a limited supply of stockpiled forage, management often wants to control access, grazing duration, and time spent in the "hay-replacement" area. As a primary management strategy to reduce costs associated with hay, the "controlled stocking" approach could have negative aspects on animal performance. This "control" strategy can be detrimental to maintenance of weight in the event that management seeks to increase forage utilization efficiency. For any deferred, stockpiled grass, the bottom third of the plant is always lower in nutritive value than the top third of the plant, Thus, in many instances of controlled, rotational stocking, animals that are forced to consume the bottom third of the plant may not maintain weight due to lowered nutritive value as well as restricted DM for intake. Thus, depending on the lactation or pregnancy stage of cows, management decisions for rotational stocking may be best for animal performance if "maximum utilization efficiency" is not the primary objective of stocking.

Hay

One of the oldest methods of conserving forage is that of hay making. Although the technology and mechanization of making, storing, and shipping hay has made some major improvements, the costs associated with hay remains largely that of a supply-demand scenario. In prolonged, drought conditions and especially those that have occurred in Texas in 2010 and 2011, excess forage for hay production becomes a limited commodity. And, during periods of below-average forage production, managers are forced to cull cattle and/or initiate hay feeding prior to the onset of the normal wintering period. Perhaps most concerning and distressing for managers is the general lack of availability of hay in addition to the increased costs. Table 1 provides estimated hay costs for cows that consume 25 lbs/day during a haying period of 60 to 180 days and with cost of hay ranging from $80 to 300/ton. The obvious, spreadsheet information shows that expensive hay and prolonged haying periods cannot be tolerated except under specific circumstances. And, in worst-case scenarios, the best option may be to disburse the cow herd.

There are several reports on methods and strategies of feeding hay on an ad libitum and restricted basis. In general, large round bales fed with free access can result in loss of hay that exceeds 25%. With current hay costs, all round bales should be offered with hay rings, etc. The question

of "what is the least amount of hay that can be fed to mature, pregnant cows?" may have some site-specific answers; however, in general, the cow likely needs at least 1% BW of forage, or about 10 to 12 lbs/day. But, additional energy and protein supplement is also required for performance, and this is most-often provided via range calves, etc. Before implementing a drastic reduction in daily DM, expectations for animal gain, reproduction, etc needs to be considered.

Table 1. Estimated hay costs for cows with variable costs per ton and duration of feeding.

	Hay Costs ($)					
Cost/ton	$80	100	150	200	250	300
Cost/lb	$0.04	0.05	0.075	0.10	0.125	0.15
Cost/day*	$1.00	1.25	1.875	2.50	3.125	3.75
Duration of Haying (days)	Hay Costs per Cow ($)					
60	$60	75	113	150	188	225
90	$90	113	169	225	281	338
120	$120	150	225	300	375	450
150	$150	188	281	375	469	563
180	$180	225	338	450	563	675

* Assumes hay fed at 25 lbs/da per cow which approximates ad libitum quantity for a mature cow.

Winter Pasture Options

In the absence of moisture and anticipated rainfall, winter annual grasses such as small grains and ryegrass or clovers may not be a viable, productive option. However, in various vegetational zones in Texas, the use of winter pastures has long-been used primarily for stocker cattle and secondarily for cows and calves. From the stand point of reliability and establishment, in most areas, we would rank these forages as small grain > ryegrass > clovers. With the increased cost of hay and reduced availability of forage for grazing, the use of winter pastures may offer an excellent option for wintering cattle under normal rainfall events.

Management and utilization of cool-season annual forages such as small grains, ryegrass, and clovers for optimum economic returns involve an integration of basic forage-animal production knowledge with the decision-ability to implement various events in a timely manner. The art and science of an economically successful grazing venture with winter annual pastures is not an especially easy task. Managers are required to make projections on forage DM growth and production as well as forage removal by grazing in order to establish an initial stocking rate. Then, successful managers are forced to revise these original estimates and project stocking rates once again during another part of the season. This does not necessarily imply that managers must buy-and-sell to adjust stocking rates; however, the dynamic nature of growth rate of cool-season annual forages requires some management flexibility in stocking density used to optimize animal gains. Thus, the primary management decisions involved with successful winter pasture grazing ventures are those of setting and manipulating stocking rates.

Forage Production and Timing of Events for Small Grains

The timing of events is generically important for the success of any endeavor. With cool-season annual forages, timing of planting, fertilization, grazing initiation, grazing duration, defoliation severity, selection of weight-class of livestock, and purchase-sell decisions control economic returns. A management calendar for small grain and ryegrass for stockers production in East Texas, for example, is shown in Table 2. The timing of events and fertilization schedules will vary with vegetational zone and soil fertility.

Table 2. Small Grain + Ryegrass Management Calendar for Cattle in the I-20 Corridor.

Month	Prepared Seedbed	Sod-Seeded
August	1st - Disk site and Roller-Pack to conserve soil moisture	1st-15th Initiate Defoliation Practices for bermudagrass (graze or hay) Do Not Fertilize
September	Plant from 5th to 15th ; Drill or Broadcast & Roller-Pack; Plant Small Grain @ 2" deep; Plant Ryegrass @ 0-1/2" deep; Fertilize at planting to soil test with N-P_2O_5-K_2O (i.e. 250 lbs/ac 21-8-17)	Graze, Harvest Hay and/or Shred. 15th to 25th Disk Lightly (2" to 3" depth, don't "turn sod"; Initiate Planting on 25th- Drill or Broadcast; Plant Small grain @ 2" deep; Plant Ryegrass broad-cast; Use Pasture-Drag/Chain-link to insure seed contact with soil; DO NOT FERTILIZE (Nitrogen will stimulate bermudagrass growth)
October	Check for Army Worms and be prepared to treat. Read label for rates and restrictions for grazing.	Planting date acceptable until late Oct Fertilize to soil test with N-P_2O_5-K_2O (i.e. 250 lbs/ac 21-8-17) when forage reaches 4" height ± usually late October to early Nov±; Climate dependent
November	Fertilize on 1st ± at 50 to 65 lbs N/ac; Initiate grazing by Nov 15th to Dec 1st with approx. 1 to 1.5-500-lb stockers/ac or limit-graze with fall calvers; Check for Army Worms until frost	Fertilize late-planted areas as above

December	Graze with 1 to 1.5-500 lb stockers/ac or limit graze with fall calvers; Fertilize on 15th ± at 50 to 65 lbs N/ac	Fertilize on Dec. 1st - 15th at 50 to 65 lbs N/ac; Initiate grazing from 15th to Jan. 15 with approx. 1 to 2-500-lb stockers/ac or limit graze with fall-calvers

Table 2 Small Grain + Ryegrass Management Calendar for Cattle in the I-20 Corridor

Month	Prepared Seedbed	Sod-Seeded
January	Graze with 1 to 1.5-500 lb stockers/ac or limit graze with fall calvers; Be prepared to offer hay and/or extra pasture area depending on stocking rate, forage availability, and climatic conditions.	Graze as in Dec. Be prepared to offer hay and/or extra pasture area due to climatic conditions
February	Graze Fertilize on 1st to 15th at 50 to 65 lbs N/ac	Graze as in Jan. Fertilize on 1st - 15th at 50 to 65 lbs N/ac
March	**NOTE:** Pasture and forage productivity will increase dramatically which will allow for increased stocking rate of 50 to 100%. Additional stockers or cows and calves will be required by March 1 to March 15 to the first of April to optimize forage utilization and animal performance per acre.	
April	Graze with 2 to 3-650-lb stockers or with cows & calves; Fertilize on 1st at 50 to 65 lbs N/ac..IF... Forage is Needed!! **NOTE:** Fertilization on this date will be dependent upon ryegrass conditions and stocking rate.	Graze with 2 to 3-650-lb stockers, or with 1 to 1.5 cows & calf/ac; If forage production is needed, fertilize on 1st at 50-65 lbs N/ac or to soil test
May	Graze Ryegrass will mature mid-to late May. Plan to terminate stocking by mid-to late May	Graze. Stockers may be removed in mid-May. If cow-calf, stock at 1 to 1.5/ac Fertilize Option ± 15th to 30th with 50-65 lbs N/ac...IF....ryegrass pasture and bermudagrass grazing is needed. **NOTE:** Fertilization on this date will be dependent upon forage conditions and stocking rate desired during the summer.

June	If available, graze summer annual "forage" such as crabgrass, bermudagrass, etc with cows and calves at w to 3 ac/cow-calf	Graze bermudagrass with cows and calves at 1 cow-calf/ac to 2 ac/cow-calf.
July	15th; Disk & prepare for planting ±	Graze bermudagrass with cows and calves as in June.

Forage DM Production of Small Grains

Small grains have a bimodal function of dry matter (DM) production during the fall-winter-spring period (Fig 1). And, when annual ryegrass is included in the forage mixture for pasture, then the late-winter-spring DM production skews the forage response heavily toward February through May. For example, small grains with or without annual ryegrass may provide initial grazing in November-December, but the magnitude of DM is based on date of establishment and fertilization schedules. Forage DM from these pastures accelerates in the fall until climatic conditions (temperature and/or rainfall) cause a dramatic reduction in growth rate usually in late December to early February. Thus, in the case of small grain-ryegrass pastures, there may actually be three distinct "seasons" in which a different stocking rate would be deemed as "optimum" (Fig. 1). The opportunity for management decisions, therefore, to capitalize on this predictable bimodal DM growth curve is to be prepared for the occurrence of erratic DM production. This does not imply that managers become meteorologists; however, within specific regions of the state, long-term weather data are available that will assist with predicting periods of climatic-risk for forage production.

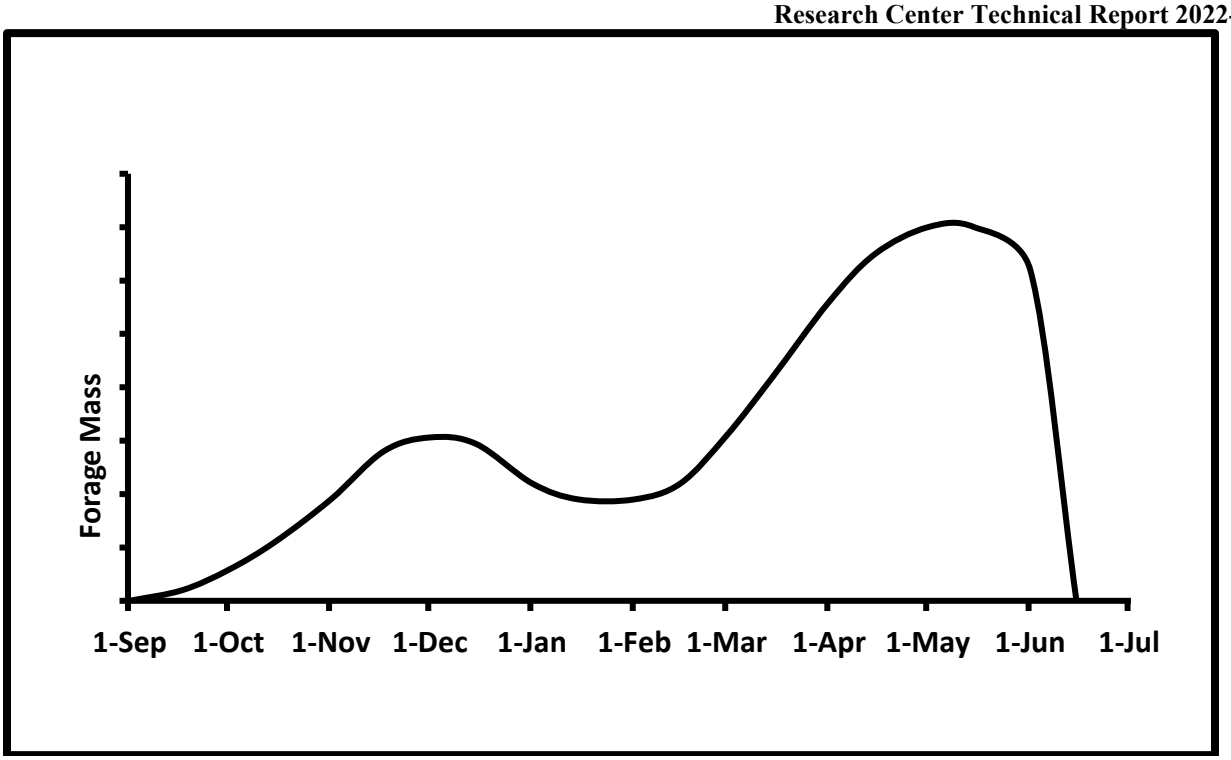

Figure 1. A generalized schematic of bimodal forage growth for rye-ryegrass in the southeastern US

Perhaps one of the best grazing management scenarios is that of having stocking rates which allow the opportunity for excess forage DM through the winter, and then expose the pasture(s) to sufficient stocking rate and severity of defoliation in the spring to maintain the forage in a vegetative stage of growth while allowing stocker calves to make near maximum daily gains (2.5 to 3.5 lbs/day). Forage production is accelerated by proper timing of establishment and fertilization. During more than 25 years of small grain ryegrass grazing at the Texas A&M AgriLife Research and Extension Center at Overton, the timing of these events has generally been as follows for over-seeded (sod-seeded) bermudagrass pastures:

1. Plant in late September to mid-October; this is rainfall-dependent.
2. Discourage fall bermudagrass growth via delayed fertilization during late summer and/or forage removal via grazing, haying or shredding. Also, one may lightly disk (2-3" depth) the sod without intent to permanently destroy the bermudagrass. In this case, the disks should not be set to "turn" sod and soil, but rather to create slight scarification of the sod. If a grain drill is used, then the drill openers will "fit" into the disk grooves. If a grain drill is not used, then seed can be broadcast-applied with a low to no N fertilizer source. The use of N fertilizer at this time will encourage bermudagrass growth.
3. After small grain-ryegrass has initiated growth to 3" to 5" and stand survival is relatively certain (barring inclimate drought or armyworm infestation), then fertilize by applying all of the P_2O_5 and K_2O requirements, and about 40 to 50 lbs/ac of N (according to soil test recommendations; usually this may range from late October to early November).
4. In late November to early December (after first killing frost) refertilize with N. (For sandy soils in East Texas, this will be about 50 to 65 lbs/ac N.)
5. Apply N fertilizer (50-65 lbs/ac N) in early February and once again in late March to early April. (At the Texas A&M AgriLife Research and Extension Center at Overton, total N rates have ranged from 200 to 250 lbs/ac, but N rate should be based on soil tests and objectives and/or requirements for DM production). Another N–fertilization (50-65 lbs/ac N) may be applied in mid-May to complete the ryegrass growth period and to initiate a "flush" of bermudagrass. The mid-May fertilization could be the last fertilizer applied during the summer months; however, stocking rate and forage DM requirements dictate this decision. Fertilization of winter annual forages and moderate stocking rates enhances nutrient cycling and creates a 12-month management program wherein the bermudagrass root system continues to use and re-use fertilizer nutrients deposited as excreta.

For other, specific soil-climate regions, fertilizer timing and rates will vary. And, for prepared seedbed plantings, timing of events does not have to contend with bermudagrass; thus, earlier planting-fertilization schedules are in order. Most importantly, grazing can be initiated earlier on prepared seedbed vs sod-seeding. Using the above-mentioned outline timing of events, small grain-ryegrass sod-seeded into bermudagrass pastures may be available for full-time grazing by late November to early December.

Stocking Method and Stocking Rate on Small Grains

The utilization of small grain-ryegrass pastures varies with management objectives and risk associated with the grazing venture. Small grain-ryegrass pastures are not inexpensive, but this

should not necessarily imply that they are too costly to justify for use in an overall grazing plan. With pasture costs of $150 to $250/ac depending on N rate, utilization of forage DM and animal performance parameters (stocking rate) control the profit potential from these pastures. Although the following stocking strategies were not intended to be an all-inclusive listing, some decisions for method of use and stocking rates for small grain-ryegrass pastures areas may include the following options to optimize forage utilization considering a bimodal DM production mold:

Option 1: Stock pastures initially so that the low winter growth rate does not necessitate animal removal. In this scenario, additional cattle must be incorporated into the grazing scheme in mid-February to early March, and/or excess spring growth must be harvested as silage or hay (hay is usually not a good alternative in March and April due to inclement weather conditions for curing). The "additional" cattle may be part of the resident cows and calves and/or may involve winter-spring purchased cattle.

Option 2: Stock pastures during the fall with a moderate to heavy stocking rate, vacate pastures during the winter, if necessary, supplement with hay and/or protein, and resume grazing in the spring. This necessitates an adjacent sacrifice area for cattle to reside during this potential 30 to 45-day winter period. This approach assumes cold, inclimate weather during December-January, and thus is site-climate specific.

Option 3: Stock pastures initially at the "optimum" spring stocking rate (1650-2000 lb BW/ac) in the vegetation zone of the Texas A&M AgriLife Research Center at Overton, and exercise a limit-graze scenario during the fall-winter period until the rapid spring forage growth rate occurs (usually late February to early March). This management strategy is a good choice for full-calving cows and involves supplemental hay and protein in addition to an adjacent "sacrificed" area for animals to reside. Normally, these limit-graze systems would entail a 2- to 3-hr grazing per day with a 20- to 22-hour deferment, or some alternate-day grazing plan. The primary objective is to have some optimum number of cattle on hand and available for grazing during the spring flush-growth period which in the Pineywoods region is March through mid-May.

Option 4: Delay stocking winter pastures until mid-to-late winter (mid-January to early February) or until the rapid spring forage growth rate occurs. A component of a stocker grazing scenario is that cattle may be purchased at a time when prices are generally higher than during the previous fall season. However, there are limited hay and supplemental requirements for this approach. Or, if cattle are purchased during the fall, backgrounding on hay or standing forage, and supplemental protein is required. This option may also be used for cows and calves.

Stocking rate, as alluded to earlier, becomes the single most important factor controlling forage regrowth, animal performance, and potential economic returns. Although stocking rate appears to be a "moving target", management can use some established "rules-of-thumb" for site specific areas.

For small grain-ryegrass pastures, any set stocking rate is likely not to be the "proper" stocking rate because of fluctuations in DM production. However, long-term grazing experiments with

stocker cattle in East Texas at the Overton Center have shown that initial December stocking rates of 650 to 800 lbs body weight (BW) usually do not necessitate a reduced or de-stocking decision due to winter climatic conditions. However, at this initial stocking density, an abundance of forage usually accumulates from mid-March to late May which requires additional cattle (increase stocking rate) or mechanical harvesting. An integral part of the stocking rate decision for small grain-ryegrass pastures is the method of stocking used. For example, a multi-pasture (n = 8±) rotational stocking system that employs a 2 to 3-day residence grazing of each pasture usually enhances forage DM production compared to similarly stocked continuously grazed pasture. Further, this magnitude of forage DM production is most dramatic during mid-winter when climatic conditions cause slow forage growth rates. If one chooses a rotationally stocked system, then cattle would likely have shorter residence time (n = 1 to 2 days) on any particular pasture in the fall and spring compared to a longer residence time (n = 2 to 4 days) during the mid-winter period. In general, as forage growth rate slows, then the movement of cattle among paddocks slows (i.e., longer resident time on each paddock). And, with fast forage growth rate, the movement of cattle is increased (faster) from paddock to paddock (i.e., shorter resident time on each paddock).

Initial stocking rates of 1000 to 1250 lbs/ac BW in the fall are subject to increased risk or likelihood of providing supplemental hay during mid-winter. And, with these higher initial stocking rates, some system of graze-rest would be preferred over continuous stocking. One reason for choosing these higher initial stocking rates is to create some "optimum" stocking rate for the 60- to 75-day period during the spring which should approach 1650 to 2000 lbs/ac BW at the Overton Center.

Management must choose the desired level of performance for stocker cattle. The age-old question for management of what do you want..... "more gain per animal or more gain per acre?", the answer is usually, "Yes". If the overall average daily gain (ADG) is to exceed 2.5 lbs/hd/day, then stockers require an abundance of forage DM from which to select their daily ration. However, if ADG of 1.8 to 2.0 lbs/day is acceptable, then less forage refusal areas (spot grazing) should be apparent, and utilization of the small grain-ryegrass pasture may range from 3" to 5" in height.

As evidenced by the above discussions, the best stocking rate plan by management exists when flexible alternatives exist and when management controls cattle numbers to fit the current situation. Some of the "best fit" stocking scenarios may exist when multiple (n = 2 or more) sets of cattle may be used to graze excess forage growth. Although many situations exist, most notable are: (a) use of additional stocker cattle in the spring which were either purchased late or backgrounded during the winter; and/or (b) use of resident fall or winter calving cows and their calves to graze excess forage on a full-time or limit-graze scenario.

Forage Production and Timing of Events for Ryegrass and Clover

Annual ryegrass has become the most widely used cool-season annual forage in Texas and in the southeastern U.S. Ryegrass may be planted alone or in combination with small grains and/or clovers. A management calendar for ryegrass of clover for East Texas is shown in Table 3.

Table 3. Clover or Ryegrass Overseeded in Bermudagrass Management Calendar for Cattle in I-20 Corridor.

Month	Clover	Ryegrass
August	Bermudagrass is primary forage; about 15th initiate defoliation plans	Bermudagrass is primary forage; about 15th initiate defoliation plans
September	Initiate close defoliation of bermudagrass via hay harvest or stocking	Initiate close defoliation of bermudagrass via hay harvest or stocking
October	15th, with closely-defoliated bermudagrass pastures, lightly disk pastures (≈2-3" deep), plant via drill or broadcast. Seed must contact soil.	1st to 15th, with closely-defoliated bermudagrass pastures, lightly disk pastures (≈2-3" deep), plant via drill or broadcast. Seed must contact soil.
November	15th - 30th, after 1st killing frost, fertilize via Soil Test with P, K, etc.	15th - 30th, after 1st killing frost, fertilize with complete fertilizer of N-P_2O_5-K_2O (i.e. 200 lbs/ac 21-8-17) via Soil Test)
December	IF...Pastures not fertilized to date, fertilize with P, K, etc by 10th	IF...Pastures not fertilized to date, fertilize by 10th. Fertilization at 50 ± lbs N/ac is needed before Dec. 10th ±
January	No Grazing	Grazing at low SR may be possible (2 to 3 acres/cow-calf) ± - Climate-dependent
February	15th, Potential to initiate grazing @ low SR (3 to 4 ac/cow-calf)	1st - 15th, Fertilize with 50 to 65 lbs N/ac; 15th initiate grazing (2 ac/cow-calf)
March	1st - Initiate full-time grazing @ 1 to 2 ac/cow-calf.	Graze (1 cow-calf/ac)
April	Graze; 15th Crimson in full flower; Arrowleaf is vegetative 1 ac/cow-calf	1st, Fertilize with 50-65 lbs N/ac (1 to 1.5 cow-calf/ac)
May	1st - Crimson clover matures; 1st - Continue grazing with cow-calf. 1 ac/cow-calf 15th Arrowleaf initiates flowering; 1-15 Harvest Hay ±	1st, Continue grazing (1 to 1.5 cow-calf/ac) 15th Ryegrass may start seed set 15th ± fertilize with 50-65 lbs N/ac

Table 3. Clover or Ryegrass Overseeded in Bermudagrass Management Calendar for Cattle in I-20 Corridor.

Month	Clover	Ryegrass
June	15th to 30th arrowleaf clover matures Bermudagrass is primary forage	1st - ryegrass matures; Hay harvest ±, Bermudagrass is primary forage
July	Bermudagrass is primary forage	1st ± fertilize with 50-65 lbs N/ac if forage for grazing or hay is needed. Bermudagrass as primary forage

Forage DM Production of Ryegrass and Clover

Although annual ryegrass may provide fall grazing when planted on prepared seedbed, most of the forage DM is produced during late winter to late spring (February through May). During a 25-year period at the Overton Center, the average initial date for stocking ryegrass pastures has been February 24th. However, this was at a time when adequate forage had accumulated to provide continuous stocking rates of about 2750 to 3000 lbs/ac BW of cows and calves on high stocked pastures. Thus, when lighter stocking rates are desired, then grazing could be initiated in late January to early February in East Texas. Initiation of grazing and stocking rate are site specific management options due to climate conditions as well as soil fertility and nutrient status for plant growth. In general, forage production of annual ryegrass increases with time from January to early spring (late April in East Texas). Plant maturation processes are usually visible via seedhead formation by early May; however, this is also a function of climate and nitrogen availability. It is not uncommon for annual ryegrass to remain vegetative and at the seedhead stage in moderately to low stocked pastures until late May to early June in East Texas.

In general, annual clovers, except for white clover, usually produce adequate forage for grazing later than that for ryegrass at any specific site. If moisture is available, white clovers from a re-seeding scenario may offer forage for grazing earlier than ryegrass. In East Texas, newly planted clovers are usually available for continuous stocking by late February to early March. Naturally reseeding clover pastures, however, may be available for grazing as early as December, but usually provide adequate DM by late January to early February. Time of grazing initiation is species dependent as well as site specific. Usually, the earlier that clovers provide grazing, the earlier that they mature and vacate the pastures. In East Texas, for example, crimson clover varieties usually initiate flowering by mid-April and do not provide much forage for grazing by mid-May. Arrowleaf clover, on the other hand, may provide grazing until mid-June to early-July but this is temperature and rainfall dependent. The timing of necessary events for clovers pertains primarily to soil pH regulation and soil nutrient availability at emergence.

Method of Use and Stocking Rate for Ryegrass and Clover

Stocking rates for ryegrass or ryegrass mixtures are similar to those mentioned for small grains during the late winter-spring months. Initial stocking rates which allow for an abundance of forage DM will provide stocker ADG of 2.5 to 3.0 lbs/day. In East Texas, this initial stocking rate would be about 1250 to 1500 lbs in early to mid-February. Pastures that are stocked sufficiently heavy to prevent forage heights from being above about 4 inches are likely to limit stocker ADG to less than 2 lbs/day.

Most ryegrass and/or clover pastures are used primarily by cow-calf operators rather than for stockers. A seven-year average of forage and cow-calf responses to multiple stocking rates at the Overton Center showed suckling, fall-born calf ADG of 1.9, 1.2, and 3.2 lbs/day, respectively, at stocking rates of 2.1, 1.3, and 0.8 cow-calf units per acre (1 cow-calf unit = 1500 lbs). On these continuously stocked pastures in East Texas, a conservative stocking rate of 0.75 to 1.25 cow-calf units has been consistently low-risk with respect to the need to de-stock or reduce stocking rate from February to weaning of fall-born calves in June-July. And, at the 0.75 to 1.0 cow-calf unit/ac level, there is usually an abundance of ryegrass-bermudagrass forage that can be harvested as hay by late-May to late-June.

Animal performance from clovers (primarily crimson), during this same time period resulted in suckling calf ADG of 1.7, 2.4, and 3.0 lbs/day, respectively, at stocking rates of 1.9, 1.2, and 0.75 cow-calf units/ac. Although suckling calf gain and pasture stocking rates were relatively similar at low stocking rates, ryegrass was more resistant to severe defoliation regimens than were the clovers. Additionally, with most clovers, except arrowleaf, grazing management decisions usually dictate that cattle be removed for hay purposes or reseeding about 30 days earlier than for ryegrass pastures. Arrowleaf clover usually matures and flowers later than annual ryegrass.

Stocking Management Options and Expectations

As always the case, grazing management options and expectations for forage production and animal response is site specific and is affected by the timing of cultural-management events and climate. For the most part, the expectations of various classes of livestock ADG under moderate stocking conditions would approximate 2.0 to 2.5 lbs/day for stockers and 2.5 to 3.0 lb/day for suckling calves. For the cool-season annual forages, and particularly small grain-ryegrass pastures, one of the most efficient methods of grazing management is to initiate a stocking rate that allows for adequate leaf area for rapid growth during late winter. Once the forage has initiated a “spring burst” of growth, then stocking rate adjustments (increases) may be made in an attempt to “catch” the pasture. However, management should not allow for such an abundance of growth that the small grain (especially rye) initiates premature flowering and flag leaf set.

The perception that rotational stocking is always better than continuous stocking is not a valid assumption. However, rotational stocking may allow for more forage growth, and judicious use of stocking rates may result in extra gain per acre as compared to continuously stocked pastures. Research at the Texas A&M AgriLife Research and Extension Center at Overton suggests that at

low (650 to 800 lbs/ac BW at initiation) to moderate stocking rate (1200 lbs/ac BW at initiation) there may be no difference in method of stocking with respect to stocker ADG; however, even at these stocking rates, the rotationally stocked pastures had more forage "residue" for potential haying compared to the continuously stocked pastures. Rotationally stocked pastures at high stocking rates (1800 lbs/ac BW at initiation) have been shown to have greater stocker ADG than stocker calves at similar stocking rates under continuous stocking.

Achieving the economic optimum grazing management and utilization of annual winter pastures is not an especially easy task. A knowledge base of forage growth expectations for a specific site, and the art of managing judicious defoliation regimens allow for the greatest opportunity for positive economic returns as well as an acceptable transition from cool-season to warm-season pastures.

Management Strategies and Options for Wintering Cattle

When the subject of "wintering cattle" is discussed, most producers direct their attention to the cow herd. However, the options for wintering stocker cattle should receive some thoughts and planning for backgrounding programs. Perhaps the program that usually receives the most attention is that of winter pastures. In most of Texas, these "winter pastures" are in reality "spring pastures" with most of the DM production occurring from February through early May. The management challenges for stocker cattle are associated with purchase price, selling price, animal health, and stocking rate adjustments during March-April. Thus, the pre-winter pasture period for stockers includes hay, stockpiled forage, and an energy-protein supplement. This adjustment period actually sets the boundaries for animal performance and profit.

For the cow-calf producer who faces the need to purchase hay or other roughage sources. The knowledge of nutritive value and availability of the forage sets the parameters for the type and amount of supplement that may be needed. With rising costs of all feed and roughage sources, only the productive cows should qualify for "spending the winter on the ranch". For those speculating on increased calf prices for the upcoming few years, then young, pregnant cows may also deserve risk of over-wintering for future herd replacements. If the wintering of cattle was easy and without much expense, then anyone could do it!! But, the reality of costs and availability of forage and feed encourages detailed management strategies with multiple options to optimize positive, economic stability of the operation.