

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATIONS

PRESCRIBED GRAZING (ACRE) Code 528

General Specifications

The following guidance and technical information is provided as general direction and reviews the requirements for specific components and the considerations of Conservation Practice Standard 528, Prescribed Grazing.

Plans and Specifications – This section further describes each item that is required within a grazing management plan when it has been determined that a resource concern is present. Resource concern planning criteria and measurement and assessment tools can be located in Section III of the eFOTG. Many of items below are referenced directly from the National Range and Pasture Handbook and more information on each section can be found there. Currently the National Range and Pasture Handbook is located online at <http://directives.sc.egov.usda.gov/viewerFS.aspx?hid=18937>

1. Goals and objectives –

- Clearly stated list or narrative indicating, as specifically as possible, the desired goals and objectives of the manager.
- Where wildlife is a primary or secondary resource concern, identify the habitat needs as they were identified in approved habitat appraisal guide. Planning will be based on the necessary components to maintain or improve food, cover, and/or shelter of the identified targeted specie.

2. Resource inventory – The resource inventory is the collection, assembly, interpretation, and analysis of the natural resource data within the planning process. This data will be used to determine the present condition of the lands in question and for comparison as the management plan is implemented. This should include the following applicable information on the plan map and/or within the plan folder in a manner that is easily understood by the producer using appropriate forms or suitable documentation:

- Locations of structures including but not limited to fences, structures, watering points and natural barriers, planned, and existing.
- Field numbers and associated acreage.

Rangeland

- Ecological sites with associated acreage and key forage *species* – Determine rangeland condition by using the required measurement tool(s) as defined in the resource concern and planning criteria worksheet in Section III of the eFOTG. Evaluation can include Rangeland Health Assessments, Similarity Index and/or Rangeland Trend, The following worksheets and references are supplied for consistency when completing these methods of inventory
 - Determining Trend – OK Modified Rangeland Trend Worksheet (NRPH Exhibit 4-6),
 - Similarity Index - OK-ECS WORKSHEET -17 (NRPH Exhibit 4-7 and Exhibit OK4-7)
 - Rangeland Health Evaluation Sheet- See Range Health Matrixes in Section II of the eFOTG (NRPH Exhibit 4-9).
- All associated acreage and key forage species for all hay land, pastureland, and grazed cropland along with needed documentation. For pastureland where a resource concern has been identified the associated pasture condition scoring worksheet and/or pasture trend will be completed during the inventory process.
- Livestock Water - Location of water developments (size, type, dependability, and other pertinent information). Within a rotational plan the livestock water supply must be

adequate to meet the demands of the livestock over the specified grazing period in each pasture or grazing cell. Refer to Conservation Practice Standard and Construction Specifications 614, Watering Facility, in Section IV of FOTG for additional information concerning water development requirements.

- Current livestock inventory that can be used to determine Animal Unit Equivalents as outlined in the NRPH Chapter 6-8.
- *Erosion predictions* – If the primary or secondary purpose for implementing prescribed grazing on a field is erosion control then erosion predictions will be included for that field. On pasture lands RUSLE 2 will be used to identify if erosion concerns are present and Rangeland Health Assessments will be used to on rangeland to determine the same.

3. Forage inventory – The expected forage quantity for each management unit for the year will be based on the data that was collected during the inventory process from above and supports the resource concerns that were identified. All data for production and composition that is collected should be based on weights as it has a direct relationship to feedstock for grazing animals. The following worksheets, tools and references are provided as acceptable documentation tools for establishing the available forage as determined during the inventory process.

- Forage, Feed and Livestock Inventory and Balance
- Forage Inventory : Oklahoma Dry Weight Rank Method
- GrazeCalc
- National Range and Pasture Handbook - Exhibits 5-1 and 5-2).

- **Hay and grain inventory (optional)** – The expected supplemental feed requirements needed to meet the desired nutritional level for the kind and class of livestock in the management unit(s) not supplied by the grazed forages listed in the Forage Inventory.

4. Feed and forage balance inventory – This section includes the documentation of projected balance of forage quantity and quality based on the inventories above, estimated for an average growing season and the resulting animals that the resource can support. This section has the ability to adjust by year based on the conditions during a specific year. Livestock producers can make adjustments to their herd based on favorable or unfavorable forage production. Documentation of surpluses and deficiencies by month from the forage resources will be documented on the GrazeCalc spreadsheet when all applicable spaces have been filled out. Other references to this can be found in the NRPH Exhibits 5-3, 5-4, 5-5).

5. Prescribed grazing schedule – The prescribed grazing schedule shall identify and record each of the following items as needed for the projected use of fields, pastures, management units or portion of a management unit identified in the resource inventory;

- Graze, rest, and deferment periods.
- Recommended Initial stocking rate.
- Adjustments to be made to the grazing schedule based on favorable or unfavorable climate conditions. (optional).
- Other pertinent treatment activities.
- Key Species and recommended use height by field or CMU – see below for more information on using key species for grazing management

- The grazing schedule will be recorded in a manner that is easily understood by the decision-maker. Documentation will depend upon the intricacy, size and available resources of the operating unit. Suitable documentation of this element of the grazing plan can include but is not limited to one or more of the following;

- i. Narrative format
- ii. GrazeCalc – Basic Spreadsheet Used to Calculate and Plan Forage Livestock Balance.
- iii. Forage, Feed and Livestock Inventory and Balance Worksheet

6. Contingency plan – Contingency planning should be developed with information gained during the inventory process, especially that information that has been gleaned from the land user. The land user is in the position to identify past problem areas like, pastures with flooding concerns, those that change quickly during periods of drought and how they have adjusted to these items

in the past. This plan is in addition to and supports the prescribed grazing schedule. It serves as a guide to adjusting the grazing system to ensure proper resource management and economic feasibility without resource degradation.

- Examples of contingency planning are listed below;
 - i. Reduction in Herd Size
 - ii. Increase or Decrease rotation periods
 - iii. Use of reserve pastures

7. Monitoring plan – A monitoring plan will be developed and that assess whether the grazing strategy is meeting the goals and objectives of the manager. This monitoring plan should incorporate the same types of methods for inventorying that were used so that data over a period of time can be compared and analyzed for changes to the system. The monitoring plan will use an appropriate recording system that is readily understood and usable by the operator in their daily operations. The monitoring plan should incorporate :an annual plan review with the producer that occurs at or near the end of the growing season where the prescribed grazing schedule is reviewed with the producer to determine:

- If the plan is meeting the desired goals and objectives according to the producer's goals and objectives and the documented resource concerns
- If the manager has accomplished the objectives of the plan.

For grazed range –

- Document prescribed grazing based on key grazing areas with designated key forage species using Form OK-ECS-414, Proper Grazing Use.
- Locations of grazing enclosure or key areas on the plan map. Grazing enclosure or key areas are used to measure the degree of use of the key forage species during the grazing season. Enclosures separate herbage loss due to grazing pressure from loss due to natural weathering and wildlife. Grazing enclosure cages will need to be moved to new locations on an annual basis in order to determine current year production and use.
- **Identify the locations of permanent transects (as applicable) on the plan map.** Permanent transects are used to evaluate long-term trend, range site condition, or ecological site condition, watershed health, and soil protection.

For pasture – Key forage species and minimum leaf length to begin and end grazing periods, and the minimum leaf length required at the end of the growing season (prior to first killing frost for warm-season species, prior to summer dormancy for cool-season species). Annually planted or reseeded forages shall have minimum residue levels identified, after grazing, to control wind and/or water erosion. The appropriate erosion control prediction model shall be used to determine residue levels. See

For crop – Minimum residue levels required, after grazing, to control wind and water erosion.

Record of the applied grazing schedule – A record, supplied by the grazing manager (that includes the graze, rest, and deferment periods, stocking rate, and other treatment activities determined pertinent and necessary to assist the grazing manager meet the goals and objectives of the plan) will be kept in the plan folder.

Mid-year plan review (optional) – The prescribed grazing schedule may be reviewed with the producer sometime during the middle of the growing season, to determine the degree of use on the key forage species. The review should be timed so the degree of use measurement is practical and that enough time is left in the growing season so management adjustments will attain the final planned degree of use of the key forage species. For example, warm-season native range should be reviewed around July 10 to 20; cool-season pastures should be reviewed around May 10 to 20. If an imbalance is determined during this review, the plan and management should be adjusted accordingly and recorded as a modification in the prescribed grazing schedule.

Resting Or Deferring Grazing Land For Specific Objectives

GENERAL

In general, *rest* implies non-grazing for a full year or longer while *deferment* implies non-grazing for less than a year. All domestic livestock must be excluded when a management unit is being rested or deferred as well as exotic animals shall be excluded when management of such can be accomplished. Grazing must be excluded for a period long enough during the growing season that will meet the objectives outlined in the prescribed grazing plan. On well-established perennial warm and cool season grasses and legumes, deferment periods of 21 to 45 days during the growing season are usually adequate for plants to recover from grazing periods that do not exceed 7 to 10 days in length. The length of rest or deferment periods is governed by the kinds, growth habits, and growth stages of the forage plants concerned and seasonal climatic conditions. Refer to Table 1 for recovery and rest periods.

The starting date for the rest or deferment periods should coincide with the beginning of a major growth period. Rest or deferment should continue until the plants to be favored have matured a seed crop or have reached a grazeable height. See Table 1 for minimum use heights.

- **Perennial Warm Season Plants**
 - To improve poor vigor and produce seed: Full season (April 1 – Nov. 15)
 - For seed production where vigor is good: Spring (April 1 – July 30) or Fall (Aug. 1 – Nov. 15)
- **Perennial Cool Season Plants**
 - To improve poor vigor: Full season (Sept. 1 – June 1)
 - For seed production only where vigor is good: Spring (Feb 15 – June 1)

Deferring Grazing on Rangeland to improve rangeland *similarity index* and grazed forestland and native pasture to improve forage value rating.

- A. Where the rangeland similarity index is 25 percent or less, or the forage value rating is low, use a full growing season deferment initially. Defer during a spring or fall period every 2 years thereafter until the rangeland similarity index is greater than 25 percent or the forage value rating is moderate. Successive deferment periods are needed when the vigor of the plants is very low and plants composing the Historic Plant Community from the Ecological Site Description on rangeland comprise less than 20 percent of the total composition.
- B. Rangeland similarity indexes of 26 to 50 percent, or a forage value rating of moderate will receive a minimum of 90 consecutive days of deferment during the growing season every 3 years.
- C. Rangeland similarity indexes of 51 to 100 percent, or a forage value rating of high will receive a minimum of 90 consecutive days of deferment during the growing season every 4 years.

A prescribed grazing sequence that provides adequate deferment periods each growing season may be used to accomplish A, B, and C above.

DEFERRED GRAZING FOLLOWING CONTROL OF PEST PLANTS

Chemical Control

The area will be deferred for the time shown by the approved label of the herbicide used or longer as required by the following deferment criteria:

A. Range/Native Plant Community

Brush Priority from Brush Management (314) Standard	Range Health Indicators	Required Deferment
High	Annual production or erosion categories: extreme or extreme to moderate	Time of treatment until frost.
Medium	Same as above	60-90 days
Low	Same as above	30-60 days
High	Annual production or erosion categories: moderate or slight to moderate or none to slight	60-90 days
Medium	Same as above	30-60
Low	Same as above	None

B. Pastureland

Brush Priority from Brush Management(314)Standard	Pasture Condition Score (PCS)	Required Deferment
High	PCS 1 or 2 for cover, vigor, or erosion	60 days
Medium	Same as above	30 days
Low	Same as above	none
High	PCS \geq 3 for cover, vigor, or erosion	30
Medium	Same as above	None
Low	Same as above	None

C. Additional Criteria:

On pastureland, when herbaceous plants are treated, defer from the time of treatment until plants reach minimum grazing heights listed in **Table 1**.

When slow-acting, soil-applied herbicides are used, the area will be deferred from the time of the first visual signs of chemical activity through the remainder of the first growing season. A deferment period during the second growing season will be based on the physiological needs of the plant community. It is highly probable that a deferment period will be needed the second growing season to allow vegetation to respond to reduced competition.

When plants such as broom snakeweed are chemically treated during the October through December period, the treated area will be deferred the next full growing season.

Where chemical control is applied after August 15th, such as basal application, the area will receive a deferment for the remainder of the growing season as well as 90 consecutive days during the spring of the succeeding year.

Mechanical Control

Rootplowing

The area will be deferred the remainder of the growing season starting when the seed is planted. If the stand is weak in vigor at the end of the first growing season, a deferment period during the second growing season will be required as needed to ensure a stand develops in the seeded area.

All Other Mechanical Methods

Apply the same treatment as above under Chemical Treatment for rangeland or pastureland.

SEEDED AREAS

All seeded or planted areas must be rested or deferred until the plants are well established. Criteria for establishment are contained in the Oklahoma NRCS Practice Standards and Specifications for Range Planting (550) and Pasture and Hay Planting (512).

For rangeland, this will be the first growing season following seeding and in many instances the second growing season. Further deferment periods during succeeding growing seasons may be necessary to establish or increase the stand. Light grazing may be possible during the first dormant season if plants are sufficiently established so that they will not be damaged.

For pastureland, graze when plants reach minimum "plant height to start grazing" listed in **Table 1** of this standard, as long as utilization heights and management insure establishment. Longer rest should be given if needed. Flash grazing can be used to control weeds. Old world bluestems planted in wheat can be established by grazing out the wheat, then resting the grass until established.

WILDLIFE BENEFIT

To favor middle and late summer forage plants, defer grazing from spring through late summer. To favor late winter forage plants, defer grazing from early fall through winter or until the occurrence of spring rains and new growth. When browse plants and perennial forbs are in low vigor, defer grazing for a full growing season and thereafter as needed. For ground nesting birds, defer grazing through the fall and winter to leave the previous year's residual grass cover. When pheasant and waterfowl are important, defer grazing in playa basins during summer and fall to favor seed producing grasses and forbs.

HERBACEOUS INFESTED GRAZING LAND

In controlled situations, concentrated grazing and browsing can be used for short periods during winter and early spring to control herbaceous weeds. A deferment is then needed until the desired recovery of the desired species is achieved. Utilizing other animals such as sheep or goats can also reduce broadleaf plants. Refer to pages in this specification for use of goats to control pest plants.

TO DEVELOP A FORAGE RESERVE OR BUILD FUEL LOAD

Defer for 90 consecutive days prior to frost or for a full growing season in western portions of the state.

FOLLOWING WILDFIRES, INSECT DAMAGE, SEVERE DROUGHT OR SIMILAR DAMAGE

Rest or defer until the vegetation has made adequate recovery during a period of favorable growing conditions.

FOLLOWING A PRESCRIBED BURN

Grazing management must be designed to accomplish the objective. Refer to guidance found in Part A., Deferred Grazing Following Control of Pest Plants under Chemical Control. The deferment period must be during the growing season of the key plants. When the objective is to increase palatability for such species as weeping lovegrass, tobosa, little bluestem, bermudagrass, etc., grazing and deferment may be scheduled as needed to accomplish the planned objective.

Prescribed Burning and Prescribed Grazing used as companion practices, such as patch burning or rotational burning, is limited to those portions of the state receiving more than 28" of rainfall. To implement patch burning, burn 1/4 to 1/3 of the grazing unit each year. The forage inventory will reflect the entire grazing unit not just the burned area, and the stocking rate will be based on the entire unit. It is assumed

that by rotating the burn areas, each portion of the field burned will receive some deferment in following years when other portions are burned.

GRAZED FORESTLAND

Exclude livestock from all areas of desirable hardwood reproduction until trees have reached a size that cannot be significantly damaged by browsing animals.

Exclude goats and sheep from pine plantings until trees are 8 feet tall. Exclude hogs from all plantings or natural reproduction of loblolly and shortleaf pine.

Livestock must be excluded from pine and hardwood plantings for at least three years after planting or seeding or until the apical meristem is above the grazing height of the livestock species. Exclude goats and sheep from pine reproduction until trees are 8 feet tall.

PASTURELAND

On pastureland that is not being intensively managed, (no fertilizer or weed control), and the plant vigor is low, but has adequate ground cover to prevent erosion, apply the same treatment as (B) above under Chemical Treatment for pastureland. Where the vigor is good, the area will be deferred according to the criteria in Table 1.

Perennial warm season grasses that are at minimum grazing use heights should be deferred 30 to 45 days prior to the first killing frost to replenish carbohydrate reserves to maintain plant vigor.

Perennial cool season grasses should not be grazed from about mid June until September, unless deferred from grazing at least 45 days during the active growth periods to maintain plant vigor.

ANNUAL COOL SEASON LEGUMES

To allow clovers the best chance to provide seed for next year, they must be deferred for 2 to 4 weeks toward the end of their production period. General deferral dates for some commonly planted clovers are as follows:

- Arrowleaf clover 5/1 – 6/15
 - Crimson clover 4/1 – 5/15
 - Ball clover 4/15 – 5/15
 - Subterranean clover 4/1 – 5/15
 - Rose clover 5/1 – 6/15
 - Vetch 5/1 – 6/15
 - Singletery peas 5/1 –6/15
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GRAZING RIPARIAN AREAS

Riparian areas should be managed either by controlled access, by developing off-site water points, by herding techniques, or through grazing management that provides enough rest period to allow establishment and/or maintenance of the vegetation. Intensive Early Stocking or rotational grazing can meet this need. Dormant season grazing can meet this need as long as livestock do not break down banks and utilization heights are proper.

The following table provides basic guidelines for deferment based on range health indicators:

Range Health Indicators	Required Deferment
Annual production or erosion categories: moderate or moderate to extreme or extreme	30–60 days
Annual production or erosion categories: slight to moderate or none to slight	15-30 days or at a time when plant height reaches minimum "plant height to start grazing" from Table 1

**Acceptable Grazing Use On Rangeland, Native Pasture, Grazed Forestland,
Grazed Wildlifeland And Pastureland**

Types of Prescribed Grazing

Criteria for Rangeland : Key Grazing Areas and Key Grazing Species

- Select Key Grazing Areas by the following criteria:
 - They must be selected for each management unit or group of management units that have similar topography, soils, grazing duration, and season(s) of use.
 - They will normally produce or have the potential to produce a significant percentage of the forage in a management unit.
 - They will be on areas that are preferred by livestock or wildlife and may become overused, before other areas in a management unit are grazed properly.
 - Key grazing areas will be located and specified for each kind of grazing or browsing animal where their key grazing area is different.
 - Areas in a management unit where seeding, brush management, prescribed burning, mowing, etc., have been completed, will become the key grazing area, at least for that grazing season.
- Key species shall be selected using the following criteria:
 - Select the highest successional preferred plant(s) as the key plant with enough of the key plants to manage. This usually comprises approximately 15 percent or more of the composition by weight.
 - If management objectives are to maintain a lower rangeland similarity index for a specific purpose, then the key plant will be the major perennial plant being managed for that purpose as long as the vegetative community is adequate to protect the soil from erosion.
 - Occasionally it may be desirable to designate different key plants for summer and winter use. More than one key species may be designated for a management unit when different kinds of livestock and wildlife are present.

- On areas where reseeding is to be carried out, the key plant will be selected after stand establishment.
- The designated key plants on which degree of use is based will need to be changed as vegetative changes occur in the plant composition.
- **Degree of use will be based on the key species on the key area using the following guidance:**
 - With less intensive grazing management during the growing season, degree of use on herbaceous plants shall be no more than 50 percent by weight of the current year's growth by the end of the grazing season.
 - When grazing is limited to the dormant season, degree of use shall be no more than 60 percent by weight of the current year's growth.
 - When a short duration type of prescribed grazing sequence is used which provides appropriate graze/rest periods for the key plants, the degree of use will be in accordance with the objectives specified for the individual situation. Degree of use may vary according to time, stage of growth, physiological condition, and climatic conditions prevalent during the grazing cycle. The overall degree of use at the end of the grazing season will not exceed 60% of the total yearly production and will leave sufficient plant residues to favorably impact site hydrology.
 - Degree of use on browse plants will be determined on the basis of current year's growth within reach of the animals. Degree of use of the key species during the growing season will not exceed 50 percent by weight of the current year's growth of available twigs and leaves. During the dormant season, degree of use of key species will not exceed 65 percent by weight of the current year's growth of available twigs of deciduous species, or twigs and leaves of evergreen species.
 - When the primary use of the land is for wildlife, less than 50 percent use by livestock may be specified to enhance wildlife habitat.
 - On eroding or critical sites, on riparian areas or wetlands, or where rapid range recovery is needed, less than 50 percent use by livestock should be specified to promote vegetative cover. Protection by means of permanent or temporary fencing may be needed.
 - Areas of excessive grazing use or concentrated livestock shall not exceed 10 percent of the management unit.
 - Use the Oklahoma NRCS Wildlife Management Guides for residual nesting height needs for the species of concern.
- **Federal Endangered /Threatened Species**
 - When these species occur on the management unit, grazing should be planned to have no effect on the species. Grazing prescriptions that have any effect, either adverse or beneficial require consultation with and concurrence of the U.S. Fish and Wildlife Service. Landowners must request in writing for NRCS to initiate consultation.

Criteria for Pastureland : Key Degree of Use

The designated forage plants will not be grazed closer than the minimum grazing heights as established in Table 1. Grazing use should not be initiated until the designated forages have reached the minimum heights shown in Table 1. These minimum heights should also be attained prior to the first killing frost in order to maintain the health and vigor of the designated forage plants.

Pastures with multiple forage plants should have degree of use determined based on season of use and desired plant community composition.

Refer to the Oklahoma NRCS Practice Standards and Specifications for Nutrient Management (590), Integrated Pest Management (595) and Herbaceous Weed Control (315) for additional information on fertilizing and weed control. For irrigated pastureland, refer to the Oklahoma NRCS Practice Standard and Specification for Irrigation Water Management (449) for timing and amounts of water.

When cool season legumes or small grains are over-seeded in a permanent sod, use the following guidance:

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- To allow for germination of the cool season species from mechanical seeding or natural reseeding, graze, mow or hay grass competition to a height of 3 inches at least 4 to 6 weeks prior to the first frost date.
- To decrease competition with the permanent sod, graze, mow or hay cool season annuals intensively as they begin to approach maturity and the permanent species begin to grow.

General Criteria for Cropland : Degree of Use

Grazing of cropland comprises two types of situations. One is using a growing crop, and the other is grazing crop stubble or residue. Grazing of all crops must be managed so that adequate crop residues remain to meet the soil loss tolerance values using current NRCS Soil Loss Prediction Technology. Refer to the Oklahoma NRCS Practice Standards and Specifications for Nutrient Management (590) and Pest Management (595) for fertilizing and pest management recommendations.

Forage sorghums

Rotational grazing will provide more grazing days per acre than continuous grazing. Most uniform grazing and least waste are achieved when the plant reaches 20 to 28 inches in height. Best re-growth is obtained if grazing is suspended when 6 to 8 inches in height remain with some succulent plant parts with buds left. A thin culmed sorghum or pearl millet recovers more rapidly and can tolerate closer grazing than do those with thicker culms.

The young plants and leaves of sorghum, sudangrass and Johnsongrass contain the highest concentration of a glycoside called dhurrin, which releases a poisonous substance known as prussic acid or hydrocyanic acid (HCN) upon breakdown. Toxic levels of cyanide or prussic acid typically occur during or after dry, hot or cold weather, trampling or other stressors than can cause losses of cattle, horses, sheep and goats when grazing plants in this condition. Reduce risk from prussic acid poisoning using these management practices:

1. Do not put hungry animals on stressed plants.
2. Delay grazing of sorghum or sorghum-cross plants until at least 15 inches tall.
3. Do not graze below 6-8 inches to maintain vigor.
4. Do not graze when plants are drought stressed and growth is severely reduced.
5. Do not graze wilted plants or plants with young tillers.
6. Do not graze for two weeks after a non-killing frost.
7. Do not graze after a killing frost until plants are dry. (The toxin is usually dissipated within 48 hours).
8. Do not graze at night when frost is likely.
9. Poisoning is less likely to occur if the animals eat some ground grain before being turned in on susceptible pasture.
10. Test forages to remove doubt.
11. Graze in the afternoon when HCN levels are reduced.

Nitrate poisoning can also occur on heavily fertilized sorghums. Nitrate accumulation in plants is worse during cloudy weather or other conditions where nitrate assimilation by the plant slows down. Rations high in carbohydrates will reduce and sometimes prevent losses from nitrate poisoning. The forage should be tested if problems are suspected.

Small grains

(wheat, triticale, barley, rye)

Initiate grazing on small grains when the plants are about 8 inches in height, fully tillered, and have a well developed coronal root system. This generally occurs 6 to 8 weeks after germination with adequate fertility and moisture conditions.

If the objective of the client is to have fall grazing of small grains, it is essential to plant during the last week in August or the first week in September. October planting dates offer unreliable fall grazing.

Grazing management strategies of winter small grains pasture occur in two different phases: a "fall & winter phase" and a "spring phase". The fall and winter phase is characterized by using accumulated forage, while the spring phase is dependent upon growth that can be described as very rapid over a short period with decreasing forage quality at the end of the grazing period. During the spring phase, the stocking rate and individual animal performance can be greater than in the fall and winter phase.

"Fall and Winter Phase"

The fall and winter phase of grazing generally occurs from November 1 through March 1. This phase of grazing relies on stockpiled forage. Stocking rates should be calculated by determining the amount of forage available at the time grazing is initiated, estimating any additional growth, account for residual ground cover, determine the number of days the forage is to be grazed, and calculate the animal demand.

During the fall and winter phase, rotational grazing with 4 - 6 grazing units will increase forage production over continuous grazing. Strive to remove only 25 to 30 percent of the available forage during any one grazing period. This allows the grazing unit time to recover from animal impact and leaves adequate ground cover to maintain warmer soil temperature and trap moisture.

"Spring Phase"

This phase generally occurs from March 1 through May 15. During this phase, manage for regrowth potential rather than stockpiled forage. Stocking rates should be calculated by determining the amount of forage available, estimating the growth anticipated from residual nitrogen plus the growth expected from a spring topdressing of nitrogen, determine the number of days the forage is to be grazed and calculate the animal demand.

For grazing management on small grains, multiple grazing units are desired over single grazing units.

Considerations for grain production of grazed small grains

If grain harvest is desired, grazing should be terminated when the stems begin to elongate (the first hollow stem can be identified above the crown in larger ungrazed shoots). This is the earliest portion of the jointing stage. For each day the wheat is grazed after the appearance of the first hollow stem, grain yields are significantly reduced

Plant Control With Goats

GENERAL SPECIFICATIONS

Goats may be used to reduce species such as oaks, Sericea lespedeza, blackberries, sumac, winged elm, greenbrier, kudzu, and other species that goats will eat. Goats may be used as initial treatment, or as a follow-up treatment to chaining, dozing, rollerchopping, prescribed burning, or shredding. Some success has been observed with eastern redcedar control. If the brush is too tall for the goats, they will eat out the understory, leaving no forage for grazing.

The past browsing experience of the goats will influence their choice of forages. If the targeted species is a novel forage, there may be a conditioning period before the goats will consume the desired forage. Goats that have prior experience will more readily begin browsing the targeted plant. Goats will also eat grasses and desirable forbs. Therefore, a rest-period is needed to achieve recovery of the desired plant community.

Record the objectives, which will be for plant reduction or sustainability. The resource inventory shall record the canopy of the targeted species. The forage inventory should reflect the initial forage-animal balance.

CONTINGENCY PLAN

The grazing plans should also contain a contingency plan to adjust the stocking rates. This would include provisions for the goats during the "off season" when deciduous forage is not available.

MONITORING

Develop appropriate records to measure progress toward goals. This could consist of canopy counts, goat days per acre, or other measures that will provide a trend analysis.

CONSIDERATIONS

The client may not want to eliminate the targeted plant from the pasture, particularly if goats are an economically beneficial enterprise. If the objectives of the goating are to browse at an intensity that will maintain the species for goats, then plan accordingly.

Removal of some woody species may adversely impact wildlife species. If wildlife is a consideration, the objective of goating should be to maintain the needed amount of brush for wildlife.

The following grazing plans are available to be used with goats to manage problem plants:

Plant Reduction

1. Priority Pasture Method

- Knock the target plants down to the goats' browsing level using mechanical, fire or other means if needed.
- Use two or more pastures (five preferred), designating one as the priority pasture. Use high density grazing that will begin when the leaf of the target brush species is one half to two thirds full size in the spring. Use enough goats to achieve 80% defoliation within 7 to 14 days in the priority pasture. A suggested starting stocking rate would be to stock at 1 goat per acre in the priority pasture for each 1-3 percent of canopy cover. Rotate the goats through the remaining pastures to maintain nutrition until the priority pasture plants have regrown to about half to two-thirds full size. This should take about 25-35 days. Pull the goats out of the rotation and put them back into the target pasture, again achieving an 80 percent defoliation.
- Repeat this process until the desired level of reduction has been achieved. Depending upon brush species and density, it may take three years to effect a favorable change.
- Once the reduction has been achieved in the priority pasture, then another pasture can be designated as a priority pasture and the process applied accordingly.

2. Thirty (30) days in and 30 Days Out or Two-Pasture Switchback Method

The most effective control occurs when new leaves and twigs are browsed in the initial stage of growth. Stock with enough goats to obtain at least 65 percent defoliation in approximately 30 days. After defoliation, rest the pasture for approximately 30 days. This system is a 30-day in and 30-day out grazing system with goats that results in at least 3 months of rest each growing season. Alternate the starting pasture each year. A minimum of 3 years of goating is generally needed to obtain desired control. Calculate stocking rate the same as the Priority Pasture method.

Sustainability

Some client objectives are to manage woody plants, including sericea lespedeza for sustained use. Grazing strategies are different than for plant reduction. There is little precedence for managing woody plants for sustainability in Oklahoma. Therefore, the following guidelines are to be used along with monitoring for self-evaluation and adjustment:

1. Multi-pasture scenario

Utilize one herd of goats in three or more pastures, five or more being preferred. Introduce the goats in the early spring. Defoliate the key species of plants to about 25% of current growth, and then rotate to the next pasture. Set the rest period so that the woody plants are not defoliated any more than twice per growing season. Select a suggested starting stocking rate of 0.25 goats for each one percent of woody cover unless a forage inventory - animal balance analysis suggests a different amount. Monitor the re-growth and goat performance. If excess use is being observed, adjust stocking rate accordingly.

2. Thirty (30) days in and 30 Days Out or Two-Pasture Switchback Method

Stock with enough goats to obtain about a 20 percent defoliation in approximately 30 days. After defoliation, rest the pasture for approximately 30 days. This system is a 30-day in and 30-day out grazing system with goats resulting in at least 3 months of rest each growing season. Alternate the starting pasture each year. Calculate the stocking rate as in the multi-pasture scenario.

3. One pasture system

Goats are introduced into the pasture only once per growing season for no longer than a 30 day grazing period. Defoliation should be targeted for 50 percent.

TABLE 1. Minimum residual height in inches and approximate recovery period.

Species	Plant Height to start grazing <u>1/</u> (in)	Average height for continuous use (in) <u>1/</u>	Average height for rotational use <u>1/</u> (in)	Approximate recovery or rest period <u>2/</u> (days)
GRASSES – Monocultures <u>3/</u>				
bahiagrass	5	3	2	20-28
bermudagrass	4	3	2	18-28
big bluestem	8	6	4	25-40
bluestems, Introduced, old world, or yellow	4	4	2	25-35
Buffalograss	4	3	2	25 - 35
creeping foxtail	6	4	3	28-32
dallisgrass	5	3	2	15-25
eastern gamagrass	12	10	8	28-45
fescue	6	4	3	21-30
hybrid wheatgrass	6	4	3	28-32
Indiangrass	8	6	4	28-40
Johnsongrass	20	10	5	21-30
'Luna' & 'Manska' pubescent wheatgrass	6	4	3	25
meadow bromegrass	6	4	3	28-32
orchardgrass	6	3	2	20-32
'Paiute' orchardgrass	6	4	3	25
ryegrass	5	3	2	14-25
Russian wildrye	6	4	3	28 - 32
sacaton, alkali	7	6	3	25-35
sand bluestem	8	6	4	25-40
sideoats grama	6	5	3	25-40
smooth bromegrass	6	4	3	25-35
switchgrass	10	6	4	30-45
weeping lovegrass	8	5	4	18-25
western wheatgrass	6	4	3	25-35
wheatgrass, tall	7	5	3	21-30
LEGUMES				
alfalfa	8	4	3	28-35
annual lespedeza	4	3	2	20-30
Sericea lespedeza <u>4/</u>	4 - 8	5	3	20-30
vetch	6	3	3	18-28
vetch, crown	6	4	3	25-35
alsike	4	3	2	25-30
arrowleaf	6	4	3	14-21
bur	4	3	2	18-25
button	4	3	2	18-25
crimson	4	3	2	18-25
Persian	4	3	2	18-25
red	4	3	2	18-25
sweet	8	4	3	21-30

1/ The specified heights are minimum for guidelines in maintaining plant health. However, for optimum growth and animal performance, less utilization is preferred during each grazing event. Use the Minimum Heights for Rotational Use to determine grazing use heights when warm season species are grazed during plant dormancy.

-Continued on next page-

2/ *The rest period should be keyed to the recovery rate of the managed species. Fast growth indicates shorter recovery periods, while slow growth rates indicate longer recovery periods. Also, irrigation and fertility levels could shorten deferment needs.*

3/ *When managing polycultures of plants, select the predominate desired species and manage accordingly.*

4/ *If the management objective is to reduce Sericea lespedeza with cattle, utilization or grazing heights can be as severe as desired. Generally, for this approach to be effective, cattle should be introduced prior to Sericea reaching 8 inches height. Very high density grazing (upwards of 25,000 pounds per acre of cattle) is recommended. The rest period should coincide with the plant regrowth rate. High-density grazing should be done again prior to Sericea reaching an 8 inch height.*