United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E511A

CONSERVATION STEWARDSHIP PROGRAM

Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Conservation Practice 511: Forage Harvest Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture, Range

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape (**See State Wildlife Action Plan for species list**). Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

Criteria

- Forage will be harvested at a frequency and height that optimizes the desired forage stand, plant community, and stand life. Follow State Cooperative Extension Service (CES) recommendations for forage harvest based on stage of maturity, moisture content, length of cut, stubble height, and harvest interval. The following criteria must be met:
    - Harvest forage at the stage of maturity that provides the desired quality and quantity without compromising plant vigor and stand longevity.
    - Harvest silage/haylage crops within the optimum moisture range for the type of storage method(s) or structure(s) being utilized. CES recommendations must be followed for optimum moisture content and levels, as well as methods and techniques to monitor and/or determine moisture content and

levels. Avoid fermentation and seepage losses of digestible dry matter from direct cut hay crop silage (moisture content >70%) by treatment with chemical preservatives or addition of dry feedstuffs. For optimal dry hay quality, rake hay at 30% to 40% moisture and ted or invert swaths when moisture is above 40%. To preserve forage quality and quantity, bale field-cured hay at 15% to 20% moisture and bale force air-dried hay at 20% to 35% moisture.

- When harvested for ensilage, forage will be chopped to a size appropriate for the type of storage structure used and optimal effective fiber. The selected length of chop will allow adequate packing to produce the anaerobic conditions necessary to ensure the proper ensiling process. A shorter chop length on very dry silage may help to ensure good packing and adequate silage density.

- Cut forage plants at a height that will promote the vigor and health of the desired species. Cutting heights will provide adequate residual leaf area; adequate numbers of terminal, basal, or auxiliary tillers or buds; insulation from extreme heat or cold; and/or unsevered stem bases that store food reserves needed for full, vigorous recovery. Follow CES recommendations for proper stubble heights to avoid winterkill of forage species in cold climates.

- Forage shall not contain contaminants that can cause illness or death to the animal being fed or rejection of the offered forage. Check CES contaminant notices, cautions, and recommendations for the specific harvest site location and area.

- Appropriate harvest schedule(s), cover patterns, and minimum plant heights to provide suitable habitat for the desired wildlife species should be implemented and maintained (See State Wildlife Action Plan).

- Time harvests to benefit the desired wildlife species by following state guidelines.

- Producer will apply and maintain at least two of the following management actions specified to improve or protect grassland functions for the state-identified or targeted wildlife species:

- Do not cut hay on at least 1/3 of the hay acres each year. Idle strips or blocks must be at least 30 feet wide.
- For at least 1/3 of the hay acreage, hay cutting must occur outside of the primary nesting or fawning seasons based on state-established dates for the targeted species.
- Increase forage heights after mowing to state-specified minimum heights for the targeted species on all hay acres.

- For all harvest activities that will occur during the nesting/fawning season, the producer will implement at least two of the following actions to flush wildlife during the harvest operation:
  - Attach a flush bar on the mower/harvest equipment.
  - Conduct all harvest/mowing during daylight hours.
  - Begin the harvest pattern either:
    - On one end of the field, working back and forth across the field or
    - In the center of the field, working outward.

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Documentation and Implementation Requirements

Participant will:

- Prior to implementation, develop a map delineating the fields selected for improving wildlife habitat and enrolled in the enhancement.
- Prior to implementation, develop a plan to harvest forage in a manner that protects stand longevity while maintaining or improving wildlife habitat. Plan must meet NRCS Conservation Practice Standard Forage Harvest Management (CPS 511) and the criteria for this enhancement. Coordinate the plan with NRCS Conservation Practice Standard Upland Wildlife Habitat Management (645), as applicable. At a minimum, plan must include the following for the forage harvest operations:
    - Goals, objectives, and specific purpose (improve wildlife habitat values)
    - At least two of the management actions specified for improving or protecting grassland functions for the state-identified target wildlife species
    - Implementation of at least two actions to flush wildlife during the harvest operation for all harvest activities that will be conducted during the nesting/fawning season
    - Forage species to be harvested
    - Details for each dominant forage species to be harvested:
        - Method of harvest
        - Harvest timing (stage of maturity, optimal harvest moisture content, length of cut)
        - Stubble height to be left
        - Harvest interval (including late harvest, if applicable)
        - Contaminant avoidance recommendations
- Prior to implementation, ensure forage harvesting tool/machinery is capable of cutting the forage at the height required to provide suitable habitat for the desired wildlife species without compromising plant vigor and stand longevity.

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- Prior to implementation, review the State Wildlife Action Plan as it relates to implementing this enhancement and provide the following information:

Wildlife Species of Concern	
Habitat Requirements, such as plant heights to provide suitable habitat	

- During implementation, keep the following documentation for each field:

Field	Forage species harvested	Harvest height (inches)	Harvest Date

- During implementation, time harvests to benefit the desired wildlife species.
- During implementation, take photographs of forage cutting heights with fields and date of harvest identified.
- During implementation, notify NRCS of any planned changes to ensure enhancement criteria are met.
- After implementation, make documentation and photographs of forage cutting heights available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- As needed, provide technical assistance to meet enhancement criteria.

- Prior to implementation, verify a map has been developed delineating the fields that will have the enhancement implemented.
- Prior to implementation, provide and explain NRCS Conservation Practice Standards Forage Harvest Management (Code 511) and Upland Wildlife Habitat Management (Code 645) as they relate to implementing this enhancement, including applicable state-specific job sheets.
- Prior to implementation, provide and explain the State Wildlife Action Plan as it relates to implementing this enhancement.
- Prior to implementation, provide technical assistance, as needed, to:
  - Develop a plan to harvest forage in a manner that protects stand longevity, while also maintaining or improving wildlife habitat.
  - Develop specifications detailing the wildlife protection measures and habitat improvement.
- During implementation, evaluate any planned changes to ensure enhancement criteria are met.
- After implementation, review documentation and photographs of forage cutting heights to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

2023 CSP ENHANCEMENTS – GUIDANCE & PERFORMANCE CERTIFICATION

E511A – Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Conservation Practice 511: Forage Harvest Management

BRIEF DESCRIPTION OF ENHANCEMENT: This enhancement will be used to reduce wildlife mortality associated with hay and small grain harvest by applying conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

DETAILED REQUIREMENTS OF ENHANCEMENT:
Landowner will **apply and maintain at least two** of the following management actions specifically for improving or protecting wildlife species:

*Grassland birds may be drawn to nest in hay fields. Do not cut hay on at least 1/3 of the hay acres each year. Idle strips or blocks must be at least 30 feet wide. Fields can be divided into sections and mowed on a rotational basis each year in order to provide for some useable habitat all during the nesting period. These areas provide alternative adjacent habitat and allow birds additional areas to nest or re-nest (for those that failed to successfully nest in active hayfields).

*For at least 1/3 of the hay acreage, hay cutting must be either before and/or after the primary nesting season based on nesting dates for the targeted species. The nesting dates in Alabama are from April 1 to July 15. The following recommended measures can be taken to minimize mortality of nesting adults and fledging juveniles. These methods will minimize nest destruction by restricting/deferring haying activities. Leave additional transition zones/corridors/escape cover extending at least 30 feet wide from the edge of a field, fence row, or water course, undisturbed during the primary nesting period. These areas provide adjacent habitat for cover and shelter by increasing edge habitat and establishing travel corridors between habitats. Transition zones that “feather” habitat changes with different heights and types of cover (from trees to open fields) provide a mixture of foods (such as seeds, insects, berries) and cover (such as nesting, brood-rearing, and escape). It is important to connect various land uses and desired cover types with travel corridors that can also provide food and escape cover. In hay fields where wildlife cover and shelter are absent or inadequate, woody vegetation may be planted or allowed to naturally re-vegetate by preserving or encouraging existing shrubby and woody cover, tall grasses, annual weed patches, and briar patches, such as blackberries, especially in field corners or along water courses.

*Increase forage heights after mowing to state specified minimum heights for the targeted species on all hayed acres. State targeted species and minimum mowing heights:

- For introduced grass pastures: the Eastern Meadowlark--5 inch residual grass height.
- For native grass pastures: the Northern Bobwhite--8 inch residual grass height.

For all harvest activities that will be conducted during the nesting season, the producer will implement <u>at least two</u> of the following to flush wildlife from mowed areas during the harvest operation to reduce mortality to wildlife. (Record producer's decisions in the "Other Management" section of the attached job sheet):

- ✓ Attach a flush bar on the mower/harvest equipment.
- ✓ Conduct all harvest/mowing during daylight hours. Nesting adults and roosting individuals are less likely to flush from cover during the night.
- ✓ *Haying patterns will be either*:
- ✓ Begin on one end of the field and work back and forth across the field, cutting the swath right beside the one that was cut on the last pass.

OR

- ✓ Begin in the center of the field and work outward to provide cover that allows fledgling birds to escape to the edge of the field (see Fig. 2).

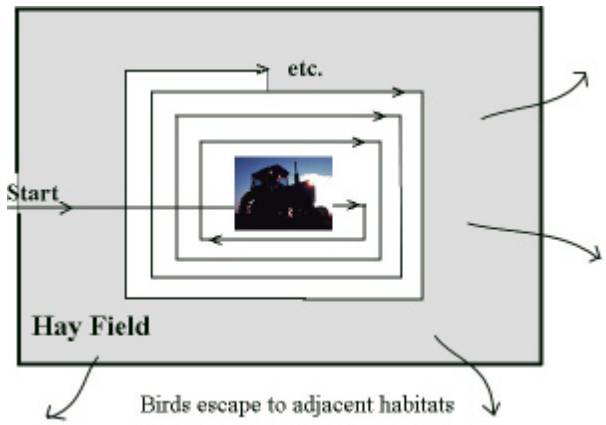


Fig. 2. Hay fields should be mowed from the center outward to allow birds to escape to adjacent habitats.

General Harvest Specifications

1. Forages will be harvested at a frequency and height that will maintain a desired healthy plant community through its life expectancy (see Tables 1-3).
2. Harvest forages at a maturity that provides the desired quality and quantity for the intended use while maintaining optimum re-growth conditions.
3. Forage will be harvested within the optimum moisture range for the type of storage

structure used.

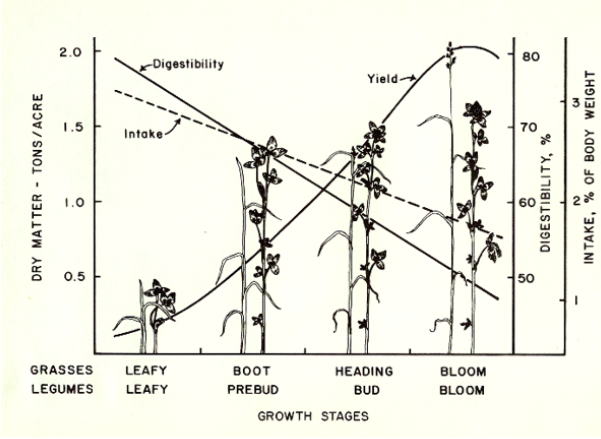
4. For nutrient uptake, use harvesting strategies to maximize uptake of available/targeted nutrients while maintaining an acceptable level of forage quality.

5. After harvest, leave enough leaf area on the plant to allow for plant survival and rapid re-growth. If forages are harvested below recommended minimum cutting height, re-growth is slowed, weeds may increase, productivity may decline, and the stand may die.

6. Allow enough recovery time after harvest to allow the forages to accumulate carbohydrate reserves necessary for re-growth in the plant crown, rhizomes, stolons, or roots.

Figure 1.

Growth stages of grasses and legumes and their effect on dry matter production, digestibility, and percent dry matter intake (from Blaser, et al., 1986)



As forages mature, digestibility and intake decrease. Deciding when to harvest hay is a compromise between quality and yield. The true quality test for hay is animal performance (see Figure 1).

Table 1. Recommended Stages to Harvest Various Hay Crops

SPECIES	STAGE TO HARVEST FOR ACCEPTABLE QUALITY & YIELD
Alfalfa	Bud stage for first cutting, one-tenth bloom for second and later cuttings. For spring seedlings, allow the first cutting to reach mid- to full bloom
Tall Fescue, orchardgrass	Boot to early head stage for first cut, afterward at 4 to 6 week intervals, or re-growth is about 10 inches
Red, arrowleaf, or crimson clovers	Early bloom
Small grains	Boot to early head stage

Soybeans	Mid- to full bloom and before bottom leaves begin to fall
Sericea lespedeza	Height of 15 to 18 inches
Annual lespedeza	Early bloom and before bottom leaves begin to fall
Ladino or white clover	Cut at correct stage for companion grass
Bermudagrass	15 to 18 inch height for first cutting, harvest every 4 to 5 weeks or when 15 inches high
Sudangrass, sorghum-sudan hybrids, pearl millet	Height of 30 to 40 inches
Bahiagrass	Height of 12 inches or every 4 – 5 weeks
Johnsongrass	Harvest at heading
Dallisgrass	Boot to bloom
Native grasses (eastern gamagrass, Indiangrass, big bluestem, switchgrass)	Harvest in early boot stage at 45 day intervals
Ryegrass	Boot to early head
Perennial peanut	Bloom, with 4-6 week intervals

Table 2. Recommended Stages to Harvest Various Silage Crops

SPECIES	STAGE TO HARVEST FOR ACCEPTABLE QUALITY & YIELD
Corn	Kernels full dent
Grain sorghum	Late milk to late dough, before leaf blades begin to die
Forage sorghum	40 inches or late boot stage
Sudangrass, johnsongrass, pearl millet	40 inches or boot stage, whichever comes first
Small grains, ryegrass	Boot to early heading
Soybeans	Late bloom - seed forming in pods and before lower leaves fall
Alfalfa, red clover	Bud to early bloom
Tall fescue, orchardgrass	Boot to early heading; afterward at 4 to 6 week intervals or when 10 inch of re-growth
Hybrid bermudagrass	15 inches at first harvest; afterward at 4 to 5 week intervals
Legume-grass mixtures	Boot to early heading for grass component

Table 3. Recommended Stubble Height and Approximate Recovery Period After Hay Harvest		
Species	**Recommended Minimum Stubble Height after Harvest (inches)**	**Approximate Recovery or Rest Period[1] (days)**
Grasses		
Bahiagrass	2-3	20-28
Bermudagrass, common	2-3	18-28
Bermudagrass, hybrid	3-5	18-28
Big Bluestem	4	25-40
Dallisgrass	2-4	21-30
Eastern Gamagrass**	8	28-45
Indiangrass	5	28-40
Johnsongrass	6	21-30
Orchardgrass	3-5	20-30
Ryegrass	2-3	14-25
Small Grains	3-4	14-25
Sorghum-sudan hybrids	6-8	21-30
Switchgrass**	8	30-45
Tall Fescue	3-4	21-30
Legumes		
Alfalfa	3	20-25
Clover, arrowleaf or crimson	2-4	14-25
Clover, red	2-3	18-25
Clover, subterranean or white	2-3	18-30
Lespedeza, annual	2-3	20-30
Perennial peanut	4	28-42
Sericea Lespedeza	4-6	18-25

Based on favorable growing conditions for the plant. Longer cycles may be needed during stress periods such as extreme heat, cold, wetness, or drought. Shorter cycles may result during favorable growing conditions.

*For perennial crops and annual crops that will be harvested by more than one cutting refer to the minimum cutting height in Table 3.

**The last cutting should be early enough to allow for re-growth to build up carbohydrates in the root systems before frost. After frost, the re-growth may be cut for hay or grazed.

ATTACH COPIES OF REQUIRED DOCUMENTS AS NOTED BY THE ENHANCEMENT JOB SHEET. CHECK THE BOX OR OTHERWISE IDENTIFY THE SUPPORTING DOCUMENTATION.

- ☐ MAPS OF THE AREA or LOCATION(S) OF APPLIED PRACTICE
- ☐ LIST ACRES AND DESCRIPTION OF PRACTICE APPLIED BY FIELD
- ☐ PHOTO DOCUMENTATION OF ENHANCEMENT.
- ☐ COMPLETE TABLE FOUND ON PAGE 5 WHICH INCLUDES FORAGE TYPE, HARVEST HEIGHT, AND HARVEST DATE, AS WELL AS WILDLIFE SPECIES OF CONCERN.

The attached documents support the full implementation of this Conservation Stewardship Enhancement.

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CSP Participant Name Date