

Soil Quality Enhancement Activity - SQL06 – *Conversion of cropped land to grass-based agriculture for biomass or forage production and wildlife habitat*



Enhancement Description

Conversion of cropped land to grass-based agriculture for biomass or forage production and wildlife habitat supports establishment and management of a mixture of high biomass producing perennial species on cropland where annually-seeded cash crops have been grown in monocultures. Perennial species are selected based on species compatibility, dry matter production, biofuel conversion or forage quality potential, and beneficial effects for wildlife. Management of grassland for wildlife includes idling land or timing harvest to avoid periods when upland wildlife are nesting or fawning, leaving a residual plant height after harvest that is favorable to wildlife nesting and fawning the following year, and applying harvesting techniques that reduce mortality of

wildlife. Grassland is mechanically harvested; it is not grazed.

Landuse Applicability

Cropland

Benefits

Perennial plants maintain a living root system throughout the year that provides habitat and organic exudates (food) for soil biota responsible for decomposition and nutrient cycling. Perennials provide soil cover for most of the year, and they are managed with no/limited physical disturbance of the soil. High plant biomass production contributes to increased soil organic matter accumulation. Plant mixtures provide diversity in plant structure and soil cover that moderate soil temperature extremes, rooting depths that improve soil structure, and residue quality that stimulates microbial activity. The combination of these factors results in improved soil quality, reduced runoff and erosion, and improved water quality.

Many species of birds and animals, including song birds, quail, turkey, pheasants, deer, and rabbits, use grasslands as cover and nesting areas, to find food, and to rear their young. Managing grassland harvesting techniques can be beneficial to the survival of ground nesting birds and other wildlife species. Altering harvesting patterns can provide escape routes for hens, hens with broods, and hiding fawns. Delaying harvest or leaving portions of a field unharvested can provide nesting habitat. When grassland management and harvesting schedules are planned to alleviate man-made pressures on wildlife, high biomass producing, perennial species can provide desirable habitat for wildlife populations.

Criteria for Conversion of Cropped Land to Grass-based Agriculture for Biomass or Forage Production and Wildlife Habitat

Cropland conversion to Grass-based Agriculture

- Establish high biomass producing, wildlife-friendly, perennial grassland species (e.g., switchgrass, big bluestem, indiagrass, eastern gamagrass, etc.) on cropland according to the NRCS Pasture and Hay Planting (512) conservation practice standard; use no-till planting methods to minimize soil disturbance when applicable



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- Use seeding mixtures of at least three perennial grasses and/or perennial forbs
- Use plant density observations from multiple areas in the field(s) to confirm successful establishment two years from the planting date; compare the actual to the recommended plant density for the seeding mix and region (e.g., at least 10 plants of the seeded mixture per square yard)

Use one of the following techniques (A or B) to protect wildlife during harvesting activities.

A. Defer harvest. The producer *will apply and maintain at least two of the following* management actions to improve or protect grassland functions for the state identified targeted wildlife species.

1. Do not harvest plant biomass on at least 1/3 of the acres each year; idled acres will not be disturbed during the primary nesting or fawning seasons based on state established dates for the targeted species; idle strips or blocks must be at least 30 feet wide
2. Harvest is allowed on all acres each year; however, for at least 1/3 of the acreage, harvest must be either before and/or after, not during, the primary nesting or fawning seasons based on state established dates for the targeted species
3. Allow time in the growing season for an increase in plant height after the last harvest to state specified minimum heights for wildlife on all harvested acres; or when harvest is conducted at the end of the summer growing season, harvest at the greater of the recommended height for the plant species or the state specified height for wildlife

B. Flush wildlife. For all harvest activities that will be conducted during the nesting/fawning season the producer will implement *at least two of the following* to protect wildlife during the harvesting operation:

1. Attach a flush bar on biomass/forage harvesting equipment
2. Harvest only during daylight hours
3. Begin all harvesting activities at one end of the field and work back and forth across the field, or begin harvest in the center of the field and work outward; avoid trapping wildlife in cover that remains in the center of a field when the harvest pattern starts at the outside and works inward

Documentation Requirements for Conversion of Cropped Land to Grass-based Agriculture for Biomass or Forage Production and Wildlife Habitat

- Provide a map showing the location of the field(s) that was/were converted from cropland to grassland; list the species that were included in the planting mix for each field
- Provide a record of plant density by species (seeded and volunteer; number of plants/sq yd for each species present) for multiple areas in the field(s) prior to harvest each year
- Provide a photo showing
 - Option A – stubble height of plants after harvest for each harvest period
 - Option B – flush bar attachment on the tractor



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NH State Supplement
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Refer to Plant Materials Technical Note No. NY-36
Seek assistance from NRCS in preparing an appropriate mix for the site.

ftp://ftp-fc.sc.egov.usda.gov/VT/Technical/TechNotes/Plant_Materials/TN36_Wildlife_Seedings.pdf

PLANT MATERIALS TECHNICAL NOTE

**Table 1. Seed Mixtures and Soil Suitability Recommendations for Conservation Cover
 (Introduced Species) ¹**

Seed Mixtures	Drainage Class				
	EWD	WD	MWD	SPD	PD
Orchardgrass 5 lbs/ac and Hard Fescue 6 lbs/ac plus Ladino Clover (upright improved varieties) 2 lbs/ac and Red Clover 2 lbs/ac or 3 lbs/ac Birdsfoot trefoil (upright varieties i.e. Pardee, Norcen or viking)		X	X		
Timothy 3 lbs/ac and Orchardgrass 4 lbs/ac and Bromegrass 3 lbs/ac plus Ladino Clover (upright improved varieties) 2 lbs/ac and Red Clover 2 lbs/ac or 3 lbs/ac Birdsfoot trefoil (upright varieties i.e. Pardee Norcen or viking)		X	X	X	
Timothy 3 lbs/ac and Orchardgrass 4 lbs/ac and Red top .5 lb/ac plus Ladino Clover (upright improved varieties) 2 lbs/ac and Red Clover 2 lbs/ac or 3 lbs/ac Birdsfoot trefoil (upright varieties i.e. Pardee) Norcen or viking)		X	X	X	X
Timothy 5 lbs/ac and Orchardgrass 5 lbs/ac plus Ladino Clover (upright improved varieties) 2 lbs/ac and Red Clover 2 lbs/ac or 3 lbs/ac Birdsfoot trefoil (upright varieties i.e. Pardee Norcen or viking)		X	X	X	

¹ Use early varieties of the grasses when available to facilitate earlier stem elongation providing earlier cover.
 These seeding recommendations are for wildlife purposes and not for critical area and highly erodible areas.

EWD = Excessively Well Drained; WD = Well Drained; MWD = Moderately Well Drained;
 SPD = Somewhat Poorly Drained; PD = Poorly Drained

TECHNICAL NOTES

**Table 2. Seed Mixtures and Soil Suitability Recommendations for Conservation Cover
(Native Warm Season Grass Species)¹**

Grass seeding rates are PURE LIVE SEED. These seeding rates ASSUME drilling seed and proper weed control. If a drill is NOT used, increase total grass seeding rate by 20%.

Seed Mixtures	Drainage Class				
	EWD	WD	MWD	SPD	PD
Switchgrass 2 lbs/ac and ² Deertongue 4 lbs/ac and Eastern gamagrass 5 lbs/ac optional *Native Forbs		X	X	X	X
Big bluestem 2 lbs/ac and Indiangrass 3 lbs/ac and Little bluestem 3 lbs/ac and Deertongue 2 lbs/ac optional *Native Forbs	X	X			
Big bluestem 4 lbs/ac and Indiangrass 4 lbs/ac and Switchgrass 2 lbs/ac optional *Native Forbs	X	X	X	X	
Big bluestem 3 lbs/ac and Indiangrass 3 lbs/ac and Deertongue 3 lbs/ac and Switchgrass 2 lbs/ac optional *Native Forbs		X	X	X	X

* Utilizing 5 species from the list. Rates based on seed size and weight and cost consideration.

¹ These seeding recommendations are for wildlife purposes and not for critical area and highly erodible areas

² This mix will not require the use of a native grass drill. If seeding conventionally, seed gamagrass 1-1 1/2" deep in grain box. Seed the remaining grass in legume box, pull tubes to allow surface seeding. Cultipack after drilling. The rest of the mixes will require a native grass drill.

EWD = Excessively Well Drained; WD = Well Drained; MWD = Moderately Well Drained;
SPD = Somewhat Poorly Drained; PD = Poorly Drained

**Table 3. Seed Mixtures and Soil Suitability Recommendations for Conservation Cover
 (Native Warm and Cool Season Grass Species)¹**

Grass seeding rates are PURE LIVE SEED. These seeding rates ASSUME No-Till Seeding. If a No-Till Drill is NOT used, increase Total grass seeding rate by 2 lbs. proportional based on existing seeding ratio.

Seed Mixtures ²	Drainage Class				
	EWD	WD	MWD	SPD	PD
Indiangrass 2 lbs/ac and Switchgrass 1 lb/ac and Little blustem 3 lbs/ac and Canada wildrye 5 lbs/ac optional *Native Forbs	X	X			
Big bluestem 4 lbs/ac and Indiangrass 2 lbs/ac and Switchgrass 1 lb/ac and Canada wildrye 5 lbs/ac optional *Native Forbs		X	X		
Big bluestem 4 lbs/ac and Eastern gamagrass 2 lbs/ac and Switchgrass 1 lb/ac and Virginia wildrye 4 lbs/ac and Deertongue 1 lb/ac optional *Native Forbs			X	X	
Fowl bluegrass 1/2 lb/ac and Fringed bromegrass 4 lbs/ac and Riverbank wildrye 4 lbs/ac and Virginia wildrye 4 lbs/ac and Switchgrass 1/2 lb/ac optional *Native Forbs		X	X	X	X
Fringed bromegrass 4 lbs/ac and Canada wildrye 6 lbs/ac and Switchgrass 1 lbs/ac and Deertongue 2 lbs/ac optional *Native Forbs		X	X	X	

* Utilizing five species from the list. Rates based on seed size and weight and cost consideration.

¹ These seeding recommendations are for wildlife purposes and not for critical area and highly erodible areas.

² Low rates of switchgrass, deertongue, and fowl bluegrass will require monitoring of seedbox to maintain seed over seed drop opening.

EWD = Excessively Well Drained; WD = Well Drained; MWD = Moderately Well Drained;
 SPD = Somewhat Poorly Drained; PD = Poorly Drained

**Table 4. Seed Mixtures and Soil Suitability Recommendations for Conservation Cover
 (Native Cool Season Grass Species)**

Grass seeding rates are PURE LIVE SEED. These seeding rates ASSUME No-Till Seeding. If a No-Till Drill is NOT used, increase Total grass seeding rate by 2 lbs. proportional based on existing seeding ratio.

Seed Mixtures	Drainage Class				
	EWD	WD	MWD	SPD	PD
Canada wildrye 5 lbs/ac and Riverbank wildrye 3 lbs/ac and and Bottlebrush 2 lbs/ac optional *Native Forbs		X	X	X	
Canada wildrye 4 lbs/ac and Virginia wildrye 4 lbs/ac and Riverbank wildrye 4 lbs/ac and Fringed brome grass 4 lbs/ac and optional *Native Forbs		X	X	X	
Riverbank wildrye 4 lbs/ac and Virginia wildrye 4 lbs/ac and Fringed brome grass 6 lbs/ac and and Fowl bluegrass 1/2 lb/ac ² optional *Native Forbs				X	X

* Utilizing five species from the list. Rates based on seed size and weight and cost consideration.

¹ These seeding recommendations are for wildlife purposes and not for critical area and highly erodible areas.

² Fowl bluegrass can be too competitive at high seeding rates, at low rates need to check seed box to assure flowing into seed drop opening, or divide seed into smaller units and place with the other seeds at appropriate intervals.

EWD = Excessively Well Drained; WD = Well Drained; MWD = Moderately Well Drained;
 SPD = Somewhat Poorly Drained; PD = Poorly Drained