Agronomy Technical Note

United States Department of Agriculture
Natural Resources Conservation Service
200 North High Street, Room 522
Columbus Ohio 43215

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TECHNICAL NOTE: – AGRONOMY – OH-5 June 2008

Conservation Cover Establishment Guide

Background: This guide is intended to assist in evaluating newly seeded stands of conservation cover and to help determine if establishment was successful, or if re-seeding is necessary.

This guide should be used in conjunction with Appendix A - Seeding Tables, appropriate job sheets, and identification guides such as the *Conservation Plants – Pocket ID Guide* and *Central Region Seedling ID Guide for Native Prairie Plants* if needed. See Section 8: References for links to these guides.

Consult Appendix A – Seeding Tables found in the Field Office Technical Guide (eFOTG) for information such as seeding rates, seeding depth, and seeding dates as well as recommendations for field preparation, planting methods, and weed control.

Section 1: Factors that Directly Impact Conservation Cover Establishment

What to Expect:
There are considerable differences between cool season and warm season grasses. You should not expect the same rate of establishment with warm season grasses. Under less than ideal conditions, it may take 3 years for warm season grasses (WSG) to be considered fully established. Even under ideal conditions, it may take 3 to 4 months before the stand can be evaluated for success. WSG seedlings will grow slowly the first year because they put their energy into establishing an extensive root system. They may only reach a height of 2-3 feet the first year, but will likely put out a seed head prior to frost.

Importance of Using Good Seed and Calculating Pure Live Seeding Rates:
Use species and varieties adapted for Ohio. See Agronomy Technical Note OH-4 Ohio Warm Season Grass Cultivars for CRP for recommendations of specific cultivars. Select species of grasses and forbs which are compatible with one another and suitable for the site conditions. Some species do better on drier soils while others will flourish on wetter soils.

Use seed from a reputable vendor that is registered with the Ohio Department of Agriculture (ODA). Be sure that the purchased seed is labeled according to ODA regulations and the Ohio Revised Code. Seed tags should contain at a minimum, the lot number, the kind and variety of seed, the percent of pure seed, the percent germination, the percent dormant or hard seed, and the name and amount of noxious weeds contained in the mix. This information is necessary to calculate pure live seed (PLS) and the appropriate seeding rate.

If there is any question about the quality of seed or if the seed is not labeled properly, it should be returned to the vendor or it can be sampled and tested by:

Ohio Department of Agriculture
Division of Plant Industry – Grain, Feed and Seed Section
8995 E. Main Street
Reynoldsburg, Ohio 43068
614-728-6410

Importance of Seeding at Rates Adjusted for Pure Live Seed:
Almost all seed has some nonviable as well as “hard” or dormant seed. Seeding rates should be adjusted to compensate for the seed that will not germinate. Warm season grasses are usually purchased on a pure live seed basis. This means that if you purchase 50 lbs of PLS, you will probably get shipped a bag containing more than 50 lbs of material. See Appendix A – Seeding Tables :Section 1 for guidance on how to calculate pure live seed (PLS).

Section 1: Factors that Directly Impact Conservation Cover Establishment

Importance of Proper Planting Depth and Seed-to-Soil Contact:
Planting depth is critical for successful establishment of conservation cover. Many failures result from planting too deeply. Conventional tillage and broadcast seeding can be successful, but good seed-to-soil contact is necessary. Be sure to prepare an adequate seedbed and use a culti-packer or similar tool when broadcast seeding.

See Appendix A – Seeding Tables: Section 1 for seeding depths and tips on field preparation and planting. Also see Agronomy Technical Note OH-2 Broadcast Seeding Warm Season Grasses for tips on broadcast seeding of warm season grasses

Importance of Weed Control When Establishing Conservation Cover:
In general, weed control is very important the first year of establishment of conservation cover. Warm season grasses and forbs especially are not very competitive as seedlings. Once established, they can compete quite well. It is recommended that measures be taken to reduce weed competition for the first year or two after planting. This can be done using tillage prior to seeding (if fields are flat), with timely applications of appropriate herbicides or by mowing. Be prepared to spray or mow during the first 2 years of establishment if weed competition threatens the new stand.

During the growing season, consecutive and well timed mowing will ensure annual weed control. Mow annuals (i.e., foxtail) with the onset of flowering, but prior to seed development. As they regrow and attempt to flower and set seed, another mowing may be necessary. Two to three mowings during the first growing season are recommended. Initially mow leaving a stubble height of 4-6 inches. Thereafter, leave a stubble height of 6-8 inches. Do not mow after August 1 to allow time for the WSGs to recover prior to going into winter.

Caution: For stands planted for wildlife cover, mowing destroys the habitat created by conservation cover. Be sure to observe mowing restrictions around the nesting season. First consider spot mowing or spraying to reduce weed competition rather than full field mowing.

For land enrolled in the Conservation Reserve Program (CRP), mowing is authorized only during the establishment period for your conservation cover as well as a possible management activity for Mid-Contract Management (must be approved), or if noxious weeds persist. Periodic or annual mowing after the seeding is established is prohibited. Spot mowing or spraying to control noxious weeds is authorized. Your local Farm Service Agency office can assist you in determining allowable weed control actions.

To further aid warm season grasses during their initial establishment, post-emergent herbicide applications of imazapic (such as Plateau®) can be used.

NOTE: This is for warm season grasses only. Seedling switchgrass and seedling eastern gamagrass could be adversely affected. Cool season grasses and legumes will be killed by this herbicide. *Any mention of trade names, such as Plateau®, does not constitute an endorsement of those products. Consult your farm product supplier for equivalent herbicides. Always read and follow label directions.*

Affect of Weather:

Weather can drastically affect the successful establishment of conservation cover. Adequate moisture the year of establishment is especially critical. Cool season grass / legume seed can loose viability if it becomes too hot prior to germination. That is one reason why it is important to follow the seeding dates set forth in Section 1 of Appendix A – Seeding Tables. If cool season grasses and legumes are planted too late they will loose viability and not germinate or, if they do germinate, they stand the chance of desiccating over the summer due to inadequate root development.

Warm season grass / legume seed, although not as sensitive to loss of viability due to heat, is still susceptible to lack of moisture or drought the first year of establishment. If adequate moisture is not present, the seed may sit dormant until conditions are more favorable for germination.

Almost all seed has a percentage of dormant or hard seed. Warm season grasses / legumes generally have a relatively high percentage of hard seed. Freezing over winter can break dormancy of hard seed – allowing it to germinate. That is why a stand of warm season grasses / legumes can show dramatic improvement the second and third year of establishment.

When to Evaluate the Stand:
Determining when to evaluate a stand can vary dramatically. As discussed above, many things such as seed quality, dormant seed, planting depth, planting date, seed-to-soil contact, available moisture, and effective weed control can all affect a successful establishment. Warm season grasses / legumes will generally take longer to establish.

Under good planting and growing conditions newly seeded stands can be evaluated:
- Cool season grasses / legumes after 1 month after seeding.
- Warm season grasses / legumes after September 1st of the seeding year.

Seeding dates listed in Section 1 of Appendix A Seeding Tables should be followed when seeding the conservation cover. The seeding window for warm season grasses in Ohio is April 1st to June 1st. Generally warm season grasses will not germinate until the soil temperature reaches 50-55 degrees Fahrenheit. Allowing for a three month establishment period, warm season grass / forb evaluations should generally not be attempted prior to September 1st of the seeding year.

Once warm season grasses and forbs experience frost, they will go dormant and turn golden brown in color. Evaluations can still be conducted at this time as they tend to stand out from cool season grasses. Evaluations should probably cease after October as the plant residue deteriorates rapidly making identification of some species difficult.

How to Construct a Sampling Frame:
1) A 42.5 in. section of 3/16" diameter flexible tubing or plastic-covered cable can be formed into a circle and joined with a small piece of ¼ " outside diameter tubing.

2) A square PVC frame can be constructed with 4 one-foot lengths of ½" PVC pipe and 4 90-degree elbows.

What to Bring to the Evaluation:
Below is a list of some items you may want to consider bringing to the evaluation.
- Conservation Plan or Job Sheet containing the seeding mix planted
- *Conservation Plants – Pocket ID Guide* and / or
  Central Region Seedling ID Guide for Native Prairie Plants
  (See Section 8: References for links to these guides)
- Sampling frame (see above)
- This Agronomy Technical Note – OH-5
- Ruler
- Magnifying glass or hand lens
- Small digging implement (knife, screwdriver, multi-tool, keys, etc.)
- *Conservation Cover Evaluation Form*
- Clip Board
- Pencil / pen
- Camera

Evaluation Procedure:

Use Section 3: Tables 1a -1b, Section 4: Table 2 and Section 5: Table 3 below to determine whether your first-year stand is adequate. Avoid sampling in areas such as end rows and double-seeded areas, as this can lead to inaccurate results. You should start your sampling transect some 20-50 feet from any edge and proceed diagonally across the field. Lay a square-foot frame or a circular frame with a 42.5-inch circumference on the ground.

Count the number of planted species and desirable volunteer seedlings within the frame, taking at least 10 counts for each 10 acres, in representative areas of the field. Record your findings on the *Conservation Cover Evaluation Form* below. Also count and record undesirable weeds (Section 5 Table 3) if any.

Tables 1a - 1b in Section 3 can be used for pure stands or mixed stands. These values are considered minimum thresholds. If the minimum thresholds have not been met, consider weather conditions prior to calling the stand a failure. Warm season grass and legume seed may be lying dormant until adequate moisture is present. Cool season grasses and legumes will most likely be a failure due to loss of seed viability. Inadequate stands should be reseeded during the next available seeding window.

Top: Partridge Pea

Right: Black-eyed Susan
Purple Coneflower
Daisy Fleabane

Conservation Cover Evaluation Form

Client Name	Tract / Field / Practice	Evaluated By:	Date:

Point Num	Native Grass Name/Number	Desirable Seeded Forb Name/Number	Desirable Volunteer Forb Name/Number	Total # Desirable Grasses & Forbs	Undesirable Volunteer Forb Name/Number	Comments

Table 1a: Established Seedlings as a Function of Seeding Rate of Pure Live Seed (PLS) for Conservation Cover and Field Borders Where Soil Erosion is the Primary Concern

(To be used in conjunction with Appendix A – Seeding Tables, Section 3 Table 1a)

Species	Seeds/lb	Pure Stand Seeding Rate Used in Seeding	5 % Minimum Establishment Threshold to be Considered Successful /[1]	5% Minimum Establishment Threshold in Seeding Mixes to be Considered Successful /[1]			
				Seeding Mixes (fraction of mix)			
			Pure Stands	3/4	1/2	1/3	1/4
	(x 1000)	(seeds/ft^2)	#plants / #ft^2	#plants / #ft^2			
Cool Season Legumes							
Alfalfa	227	42	>= 2/ 1 ft^2	8/5 ft^2	1/1ft^2	2/3 ft^2	1/2 ft^2
Alsike clover	700	48	>= 5/ 2 ft^2	9/5 ft^2	6/5 ft^2	4/5 ft^2	3/5 ft^2
Birdsfoot trefoil	375	52	>= 5/ 2 ft^2	2/1 ft^2	4/3 ft^2	9/10 ft^2	2/3 ft^2
Kura clover	227	31	>= 3/ 2 ft^2	6/5 ft^2	4/5 ft^2	1/2 ft^2	2/5 ft^2
Red clover	275	51	>= 5/ 2 ft^2	2/1 ft^2	4/3 ft^2	9/10 ft^2	3/5 ft^2
Ladino clover	860	55	>= 11/ 4 ft^2	2/1 ft^2	4/3 ft^2	9/10 ft^2	2/3 ft^2
Cool Season Grasses							
Garrison creeping foxtail	750	103	>= 5/ 1 ft^2	4/1 ft^2	13/5 ft^2	5/3 ft^2	4/3 ft^2
Kentucky bluegrass	2200	500	>= 25/ 1 ft^2	18/1ft^2	12/1 ft^2	8/1 ft^2	6/1 ft^2
Perennial ryegrass	237	130	>= 13/ 2 ft^2	5/1 ft^2	10/3 ft^2	2/1 ft^2	8/5 ft^2
Orchardgrass	590	130	>= 13/ 2 ft^2	5/1 ft^2	10/3 ft^2	2/1 ft^2	8/5 ft^2
Timothy	1230	113	>= 11/ 2 ft^2	4/1 ft^2	14/5 ft^2	2/1 ft^2	4/3 ft^2
Native Grasses							
Big bluestem	150	41	>=2/ 1 ft^2	3/2 ft^2	1/1 ft^2	2/3 ft^2	1/2 ft^2
Little bluestem	255	41	>=2/ 1 ft^2	3/2 ft^2	1/1 ft^2	2/3 ft^2	1/2 ft^2
Eastern gama grass	7.4	1.5	>= 1/ 13 ft^2	1/10 ft^2	1/25 ft^2	1/35 ft^2	1/50 ft^2
Indiangrass	175	40	>=2/ 1 ft^2	3/2 ft^2	1/1 ft^2	2/3 ft^2	1/2 ft^2
Switchgrass	370	42	>= 2/ 1 ft^2	8/5 ft^2	11/10 ft^2	2/3 ft^2	1/2 ft^2
Canada wildrye	115	13	>= 2/ 3 ft^2	1/2 ft^2	3/9 ft^2	1/5 ft^2	1/6 ft^2
Virginia wildrye	75	9	>= 1/ 2 ft^2	3/9 ft^2	1/4 ft^2	1/7 ft^2	1/10 ft^2
Sideoats Grama	190	39	>= 2/ 1 ft^2	3/2 ft^2	1/1 ft^2	2/3 ft^2	1/2 ft^2
Native Forbs							
Where included as part of typical conservation cover, native forbs should be represented by at least **1 established seedling per square foot**. 1. Although native forbs seed mixes based on weight of seed will yield vastly different seed rates depending on the species used, mixes consisting of commonly used species seeded at the 0.25-0.5 pounds per acre rate should provide at least 1 established seedling per square foot. 2. If unique or atypical mixes are used (e. g. CP 25 or CP33), an estimate of expected seedlings can be made using values in Table 2 of Appendix A and an assumed 50% germination rate. 3. Count only those species considered desirable as listed in Table 2 in Section 4.							
Footnotes:							
/1 Number of plants per number of square feet is for first year establishment. For second year establishment of WSGs, **double** the number of plants per number of square feet listed for first year establishment. For third year establishment of WSGs, **triple** the number of plants per number of square feet listed for first year establishment.							

Table 1b: Established Seedlings as a Function of Seeding Rate of Pure Live Seed (PLS) for Conservation Cover and Field Borders Where Wildlife Habitat is the Primary Concern

(To be used in conjunction with Appendix A – Seeding Tables, Section 3 Table 1b)

Species[/1]	Seeds/lb	Pure Stand Seeding Rate[/2]	5 % Minimum Establishment Threshold to be Considered Successful /[1]	5% Minimum Establishment Threshold in Seeding Mixes to be Considered Successful /[1]			
				Seeding Mixes (fraction of mix)			
			Pure Stands	3/4	1/2	1/3	1/4
	(x 1000)	(seeds/ft^2)	#plants / #ft^2	#plants / #ft^2			
Cool Season Legumes							
Alfalfa	227	42	>= 2/ 1 ft^2	8/5 ft^2	1/1 ft^2	2/3 ft^2	1/2 ft^2
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Kura clover	227	31	>=3/ 2 ft^2	6/5 ft^2	4/5 ft^2	1/2 ft^2	2/5 ft^2
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Ladino clover	860	55	>= 11/ 4 ft^2	2/1 ft^2	4/3 ft^2	9/10 ft^2	2/3 ft^2
Cool Season Grasses							
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Perennial ryegrass	237	130	>= 13/ 2 ft^2	5/1 ft^2	10/3 ft^2	2/1 ft^2	8/5 ft^2
Timothy	1230	113	>=11/ 2 ft^2	4/1 ft^2	14/5 ft^2	2/1 ft^2	4/3 ft^2
Native Grasses /1							
Big bluestem	150	21	>=1/ 1 ft^2	4/5 ft^2	1/2 ft^2	2/5 ft^2	1/4 ft^2
Little bluestem	255	20	>=1/ 1 ft^2	4/5 ft^2	1/2 ft^2	3/9 ft^2	1/4 ft^2
Eastern gama grass	7.4	1.5	>= 1/ 13 ft^2	1/10 ft^2	1/25 ft^2	1/35 ft^2	1/50 ft^2
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Canada wildrye	115	13	>=2/ 3 ft2	1/2 ft^2	3/9 ft^2	1/5 ft^2	1/6 ft^2
Virginia wildrye	75	9	>=1/ 2 ft^2	3/9 ft^2	1/4 ft^2	1/7 ft^2	1/10 ft^2
Sideoats Grama	190	20	>=1/ 1 ft^2	4/5 ft^2	1/2 ft^2	3/9 ft^2	1/4 ft^2
Native Forbs							

Where included as part of typical conservation cover, native forbs should be represented by at least **1 established seedling per square foot**.
1. Although native forbs seed mixes based on weight of seed will yield vastly different seed rates depending on the species used, mixes consisting of commonly used species seeded at the 0.25-0.5 pounds per acre rate should provide at least 1 established seedling per square foot.
2. If unique or atypical mixes are used (e. g. CP 25 or CP33), an estimate of expected seedlings can be made using values in Table 2 of Appendix A and an assumed 50% germination rate.
3. Count only those species considered desirable as listed in Table 2 in Section 4.

Footnotes:

/1 Number of plants per number of square feet is for first year establishment. For second year establishment of WSGs, **double** the number of plants per number of square feet listed for first year establishment. For third year establishment of WSGs, **triple** the number of plants per number of square feet listed for first year establishment.

Section 4: Desirable Native Forbs to be considered in Stand Evaluation

Table 2: Desirable Native Forbs to be Considered in Stand Evaluation

Legumes	
Canadian milk vetch (*Astragalus canadensis*)	**Illinois Bundleflower** *(Desmanthus illinoiensis)*
Prairie False Indigo (*Baptisia leucantha*)	**Canada Tick-Trefoil** (*Desmodium canadense*)
Partidge Pea (*Cassia fasciculata*)	**Round-headed bush clover** (*Lespedeza capitata*)
Wild Senna (*Cassia hebecarpa*)	**Slender bush-clover** (*Lespedeza virginica)*
Non-Legumes	
Nodding Wild Onion (*Allium cernuum*)	**Jewelweed** *(Impatiens capensis)*
Common Ragweed (*Ambrosia atemisiifolia*)	**Rough Blazing-Star** *(Liatris aspera*)
Swamp Milkweed (*Asclepias incarnata*)	**Dense Blazing-Star** (*Liatris spicata*)
Common Milkweed *(Asclepias syriaca)*	**Wild Begamot** (*Monarda fistulosa*)
Butterfly Weed (*Asclepias tuberosa*)	**Evening Primrose** (*Oenothera oakesiana*)
Smooth Aster (*Aster laevis*)	**Smartweed** (*Polygonum sp.*)
New England Aster (*Aster novae-angliae*)	**Virginia Mountain Mint** (*Pycanthemum virginianum*)
Beggar Ticks/Bur Marigold (*Bidens sp.*)	**Gray-Headed Coneflower** *(Ratibida pinnata)*
Sedges (*Carex sp.)*	**Pasture Rose** *(Rosa carolina)*
Tall Coreopsis (*Coreopsis tripteris*)	**Black-eyed Susan** (*Rudbeckia hirta*)
Purple Coneflower (*Echinacea purpurea*)	**Prairie Dock** (Silphium terebinthinaceum)
Mistflower (*Eupatorium coelestinum*)	**Stiff Goldenrod** (*Solidago rigida*)
Joe-pye Weed (*Eupatorium fistulosum)*	**Rough Goldenrod** (Solidago rugosa)
Common Boneset (*Eupatorium perfoliatum*)	**Showy Goldenrod** *(Solidago speciosa)*
Wild Geranium *(Geranium maculatum)*	**Ohio Spiderwort** *(Tradescantia ohioensis)*
Sneezeweed (*Helenium autumnale*)	**Blue Vervain** *(Verbena hastata)*
Sawtooth Sunflower (*Helianthus grosseserratus*)	**Western Ironweed** *(Vernonia fasciculata)*
Western Sunflower (*Helianthus occidentalis*)	**Golden Alexanders** (*Zizia aurea*)
Smooth Oxeye Sunflower (*Heliopsis helianthoides*)	

This list includes species that are typically planted as well as some that may volunteer in on their own. Use of Plateau® or Journey® will significantly reduce the number of native forbs intolerant of these products that could be expected to volunteer on their own. *Any mention of trade names, such as Plateau® or Journey®, does not constitute an endorsement of those products. Consult your farm product supplier for equivalent herbicides. Always read and follow label directions.*

Section 5 Undesirable Species in Stand Evaluation

Undesirable Species

It is common for plant species other than those included in the planned seed mix to germinate in areas established in conservation cover. They may originate from seed or plants present in the field before planting, incidental seed included in the planted seed or seed carried in by wind, water or animals. Some of these species may not be particularly harmful to the intended use of the stand and can be tolerated. However some may have serious negative consequences due to their competition with desired species during initial establishment or because of their likelihood of eventually dominating a stand and limiting the value of the planned cover. Table 3 lists species that may be a problem in conservation cover and that need special attention during stand evaluation and for which control measures should be implemented.

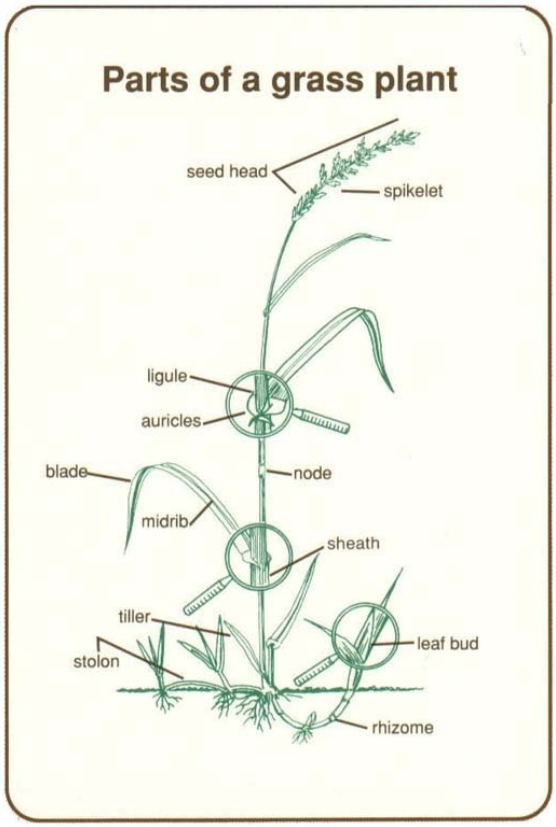
Table 3: Undesirable Species

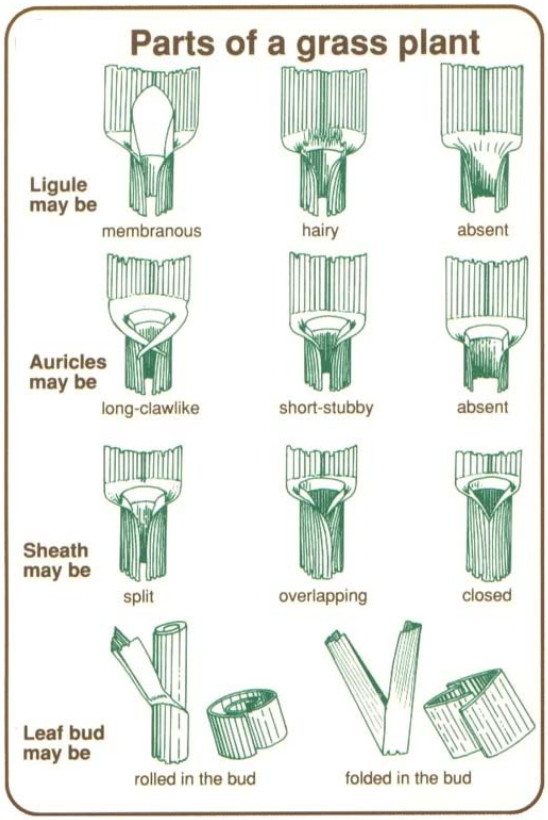
Species	Comments
Johnsongrass* (*Sorghum halepense*)	May be significant problem during establishment; should attempt elimination from the stand.
Tall Fescue (*Lolium arundinaceum*)	Although more of a problem after establishment, it may be a problem when converting old grass stands; should attempt elimination from the stand.
Reed Canarygrass (*Phalaris arundinacea*)	In wetter areas; usually not significant problem in well-managed stands; prevent from going to seed; keep it less than 10% coverage in the stand.
Common Reed Grass (*Phragmites australis*)	In wetter areas; usually not significant problem in well-managed stands; prevent from going to seed; keep it less than 10% coverage in the stand.
Poison Hemlock* (*Conium maculatum*)	More of a problem after establishment; should attempt elimination from the stand
Wild Carrot* (*Daucus carota*)	May be a problem during establishment and in poorly-managed stands; prevent from going to seed; should attempt elimination from the stand.
Marestail* (*Conyza canadensis*)	May be a problem during establishment and in poorly-managed stands; prevent from going to seed; should attempt elimination from the stand.
Russian Thistle* (*Salsola kali*)	More of a problem after establishment; prevent from going to seed; should attempt elimination from stand.
Canada Thistle* (*Cirsium arvense*)	May be significant problem during establishment; should attempt elimination from the stand.
Spotted Knapweed (*Centaurea maculosa*)	More of a problem after establishment; prevent from going to seed; keep it less than 10% coverage in the stand.
Kochia* (*Bassia scoparia*)	May be significant problem during establishment; should attempt elimination from the stand.
Palmer Amaranth* (*Amaranthus palmeri*)	May be significant problem during establishment; should attempt elimination from the stand.
Purple Loosestife* (*Lythrum salicaria*)	In wetter areas; usually not significant problem in well-managed stands; should attempt elimination from the stand.
Canada Goldenrod (*Solidago canadensis*)	May be a problem during establishment and in poorly-managed stands; prevent from going to seed; should attempt elimination from the stand.
Teasel (*Dipsacus fullonum*)	May be a problem during establishment and in poorly-managed stands; prevent from going to seed; keep it less than 10% coverage in the stand
Giant Ragweed (*Ambrosia trifida*)	May be a problem during establishment and in moist poorly-managed stands; prevent from going to seed; keep it less than 10% coverage in the stand
White Heath Aster (*Aster ericoides*)	May be a problem during establishment and in poorly-managed stands; prevent from going to seed; keep it less than 10% coverage in the stand
*__Ohio ODA listed prohibited noxious weeds__. It may not be possible in every case to eliminate these weeds from the stand but every effort should be made to control them.	

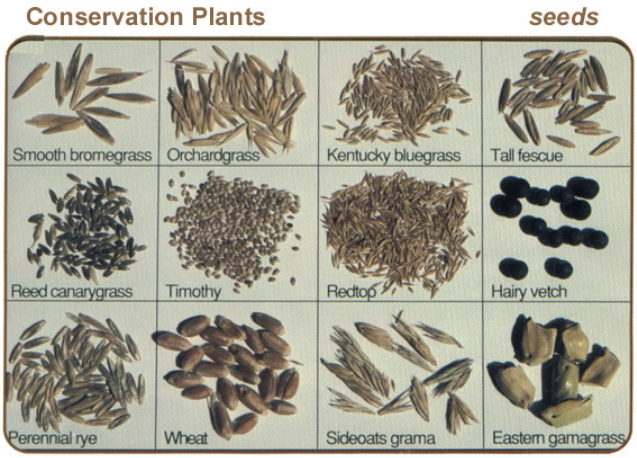
Section 6: Identification of Grasses Commonly Used for Conservation Cover

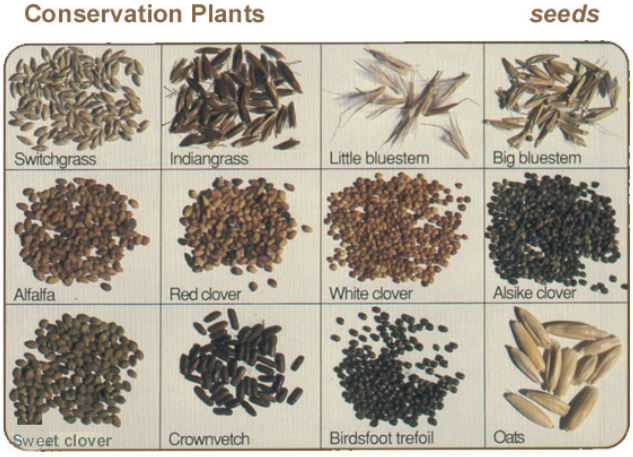
For evaluators who are not confident in identifying grasses, legumes and forbs commonly used for conservation cover, it is highly recommended that you utilize field identification guides such as the *Conservation Plants – Pocket ID Guide* and *Central Region Seedling ID Guide for Native Prairie Plants*. They can be downloaded at:

http://www.plant-materials.nrcs.usda.gov/technical/plantid/index.html









Big Bluestem
(Andropogon gerardii)

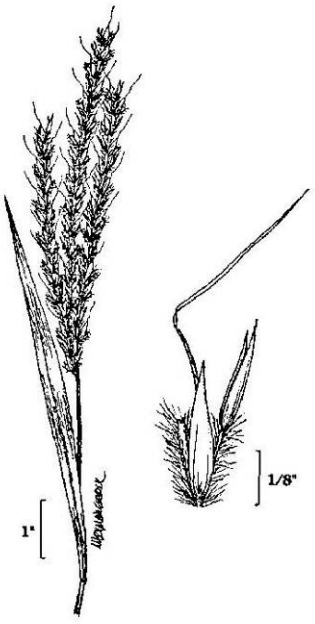
Description:

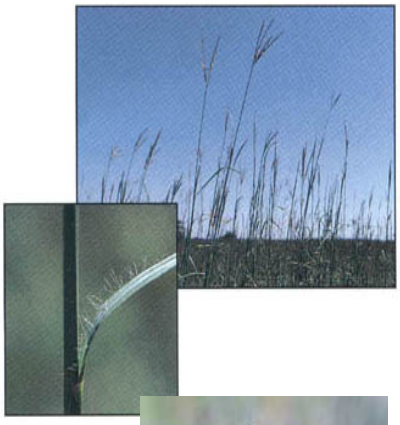
Andropogon gerardii, big bluestem, is a native, perennial, warm season grass that occurs from the short grass prairie region to the Atlantic Ocean. It is tufted, forms sod, and has short, scaly rhizomes. Big bluestem is tall, reaching a height of 6 to 8 feet on most sites where it is protected from grazing. It is very leafy at the base, with some leaves carried up on the stem. The seed heads normally have three spikelets that appear like a 'turkey foot.'

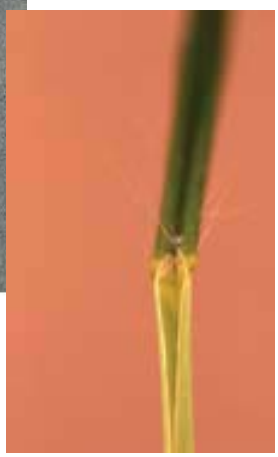
- Spreads by short rhizomes
- Somewhat bunchy
- Height: 5 to 9 feet
- Blooms: June – Sept
- Flower heads resemble upside down turkey foot.
- Flower heads open red and turn darker with age.

Identification Tips:

- Sheath: Round to somewhat flattened, open, often purplish at the base, usually hairy.
- Blade: Rolled in the bud shoot, silky hairs widely dispersed on the upper leaf surface.
- Leaves are up to 2 feet long and less than 1/2 inch wide, hairy at the base, stem, and leaves.
- There is a small, scale-like collar (ligule) with a fringed margin where the leaf blade joins the stem.







Switchgrass
(*Panicum virgatum*)

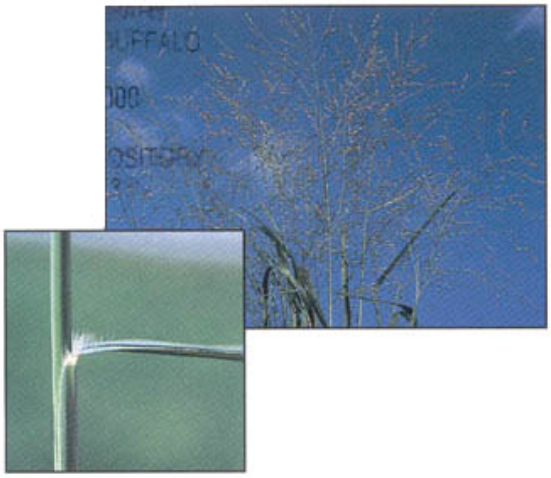
Description:

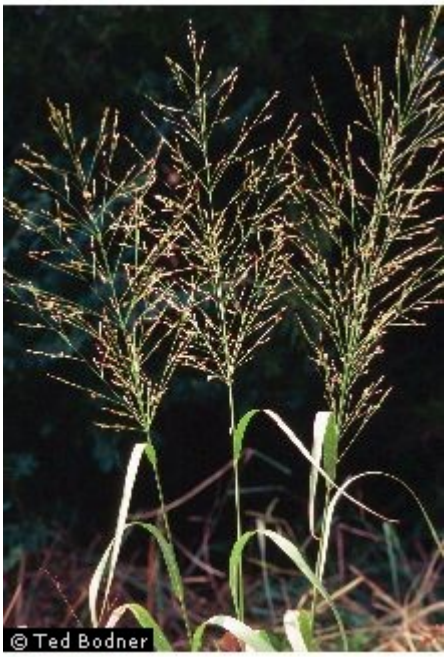
Panicum virgatum L., switchgrass, is a warm season grass, native to all of the United States except California and the Pacific Northwest. It is a perennial sod-forming grass that grows 3 to 5 feet tall and can be distinguished from other warm season grasses, even when plants are young, by the white patch of hair at the point where the leaf attaches to the stem. The stem is round and usually has a reddish tint. The seed head is an open, spreading panicle.

- Sod forming
- 3 to 6 feet tall

Identification Tips:

- Sheath: Round, open, white to purplish tinged below.
- Blade: Rolled in the bud shoot, flat up to 1/2 inch wide.
- Ligule: Fringe of hairs with a dense mat of hairs extending onto the upper leaf surface.





Little Bluestem
(Schizachyrium scoparium)

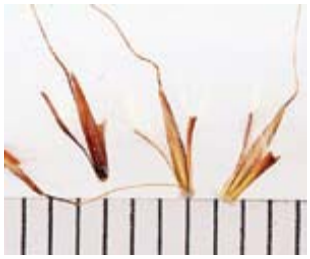
Description:

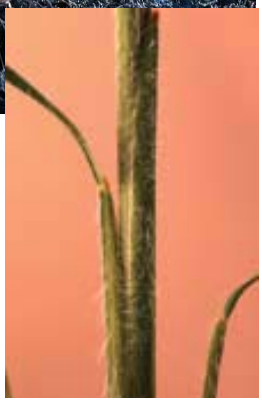
Schizachyrium scoparium is a warm season, short bunch grass with coarse blue-green stems and basal leaves which often appear purplish. Leaves are smooth, but frequently are covered with hair at the base next to the sheath. Leaves tend to fold with maturity. Seed head clusters are about 3 inches long and consist of a number of short, silvery hairs (awns) when the seeds are ripe. In the late summer to early fall, a low sun slanting across the seed heads of this grass give the plant a frosty appearance.

- Spreads by short rhizomes
- Somewhat bunchy
- Height: 2 – 4 feet
- Blooms: August – Sept
- Purplish-bronze flowers appear along 3-inch long stalks on branched stems.
- Plants form upright clumps of green
- Leaves, with trace of blue at base.

Identification Tips:

- Sheath: Round, open, may be hairy at the base.
- Blade: Rolled in the bud shoot, flat, narrowed at base.
- Ligule: Prominent, membranous, clawlike- often referred to as a rifle sight. A small, scale-like collar and a fringed margin where the leaf blade joins the stem.
- Leaves are up to 12 inches long and less than 1/4 inch wide.
- Stems are very hairy and strongly flattened near the base.





Indiangrass
(*Sorghastrum nutans*)

Description:

Sorghastrum nutans (L). Nash, Indiangrass, is a native, perennial, warm-season grass.

Indiangrass grows 3 to 5 feet tall. Even as a young plant, it can be distinguished from other native grass species by the “rifle-sight” ligule at the point where the leaf attaches to the stem. The leaf blade also narrows at the point of attachment. The seed head is a single, narrow, plume-like panicle of a golden brown color. The seed is light and fluffy with small awns attached.

- Spreads by short rhizomes
- Somewhat bunchy
- 3 to 6 feet tall

Identification Tips:

- Sheath: Round, open, may be hairy at the base.
- Blade: Rolled in the bud shoot, flat, narrowed at base.
- Ligule: Prominent, membranous, clawlike-often referred to as a rifle sight.

Canada Wildrye
(***Elymus canadensis*** **L.**)

Description

Canada wildrye is a native perennial, cool season bunchgrass that grows to 4 feet with erect or arching culms and flat, wide (up to 0.8 inches), waxy green, pointed leaves that grow from the base of the stem to the spike. Auricles are clawlike and clasping, arising from a broad, yellowish or light green collar. The thick and bristly spikelets can reach 10 inches in length and are often two or three to a node. There are approximately 115,000 seeds per pound. Spreads by short rhizomes.

Identification Tips:

Leaf blades are flat or round when dry and the ligule is membranous. Culms stout and tufted. Two or more spikelets on the rachis node are arranged on each side of the rachis. Awns are divergently curved and 2 to 4 cm long. Plants are usually about 1m tall.

Eastern gamagrass
(*Tripsacum dactyloides* L.)

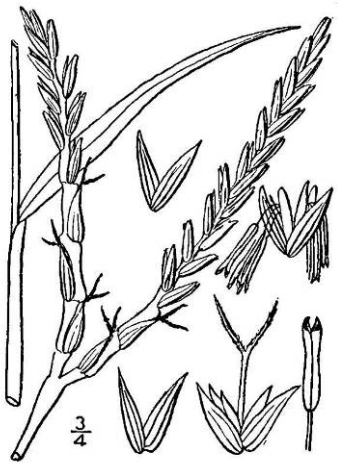
Description:

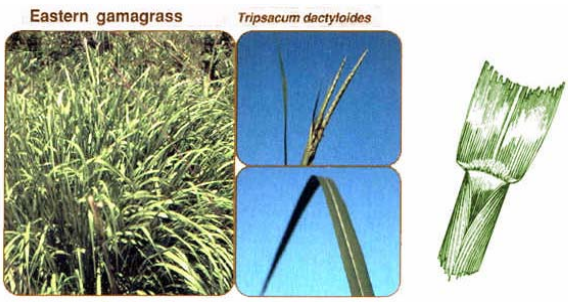
Tripsacum dactyloides L., eastern gamagrass, is a native, warm season, perennial, sod-forming grass that is a distant relative of corn. This plant can reach a height of up to 8 feet. Seed is produced from June to September. The seed heads are 6 to 10 inches long and are made up of one to several spikes. The leaves can be 3/8 to 3/4 inch wide and 12 to 24 inches long. They also have a well defined midrib.

- Perennial grass
- Forms bunches up to 4 feet in diameter with thick short jointed rhizomes
- Grows 6 to 8 feet tall

Identification Tips:

- Sheath: Flattened and open.
- Blade: Rolled in bud shoot, flat, smooth, up to 1/2 inch wide, with large, prominent, light-colored midrib.
- Ligule: Ring of short hairs.
- Seedling looks like a small corn plant.





Black-eyed Susan
Rudbeckia hirta

Description:

• Height: 1 to 3 feet

• Blooms: June – October

• This short-lived perennial has a single flower head at the top of each stem branch.

• Flower heads are 2 to 3 inches across with 10 to 20 ray flowers around a domeshaped disk.

Identification Tips:

• Basal leaves densely hairy – up to 5 inches long and 1 inch wide.

• Leaf base narrowly tapers along the leaf stalk.

***Scale = 1/16 inch increments*

Illinois Bundleflower
Desmanthus illinoensis

Description:

• Height: Up to 4 feet

• Blooms: June – August

• Each flower has fine, long stamens that provide a fuzzy appearance.

• Plants are smooth and bushy and produce small, round flower clusters.

Identification Tips:

- Numerous paired leaflets appearing fernlike.

***Scale = 1/16 inch increments*

Korean lespedeza
Kummerowia stipulacea)

Identification Tips:

Description:

Korean and common lespedeza (*Kummerowia striata*) are introduced, annual, warm-season legumes. Flowers and seeds are borne in the leaf axils at the tips of stems and branches in the Korean lespedeza and in the leaf axils all along the stem in common lespedeza.

- Two types of flowers are produced. One is readily seen as purple-bluish and the other has no petals and is inconspicuous.

***Scale = 1/16 inch increments*

Partridge Pea
Chamaecrista fasciculata

Description:

• Height: Up to 2 feet

• Blooms: June – October

• An annual plant with alternate leaves, there are 1 – 6 flowers on slender stalks that emerge at the axil of the leaf and stem.

• Each flower has five yellow petals, with three slightly smaller than the other two.

• There is a tinge of red at the base of each petal and 10 dark red stamens.

Identification Tips:

• Pinnately compound leaf divided into about 20 pairs of leaflets.

• Single bristle at the tip of each leaflet.

• Single gland at base of leaf stalk that attracts native species of ants.

***Scale = 1/16 inch increments*

Purple Coneflower
Echinacea purpurea

Description:

• Height: Up to 3 feet

• Blooms: May – October

• Flower heads are showy and quite large.

• The orange disk is surrounded by 10 to 20 long, minute flowers in various shades of magenta.

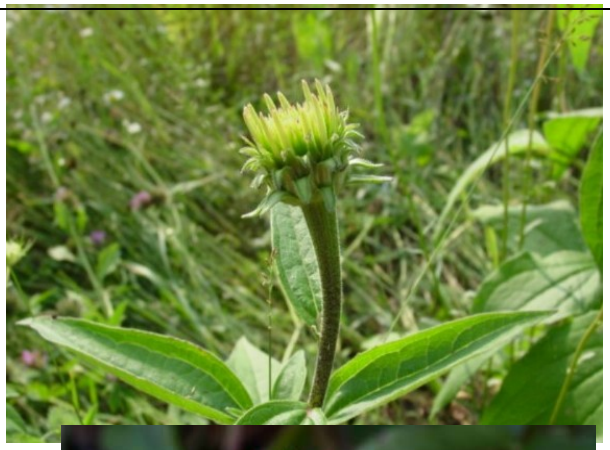
Identification Tips:

• Basal leaves on long, partly-winged stalks.

• Leaf margin smooth on early leaves, becoming coarsely toothed on later leaves.

• Leaves broadest at the base and tapering to a pointed tip.

***Scale = 1/16 inch increments*



Section 8: References

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Midwest States 2000

Conserving the Resources. Preserving the Future

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USDA-Natural Resources Conservation Service
Elsberry Plant Materials Center
2803 North Highway 79
Elsberry, Missouri 63343
Phone: 573-898-2012
http://plant-materials.nrcs.usda.gov
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Missouri Department of Conservation
PO Box 180
Jefferson City, Missouri 65102
Phone: 573-751-4115
http://mdc.mo.gov/grownative/plantID/

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Dr. Mary Ann Rose, Assistant Professor
Cassandra Sheaffer, Graduate Extension Assistant

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