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USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

# South Carolina 327 (Conservation Cover) Technical Guide

**Use this jobsheet to provide guidance for: the establishment of native plants for wildlife or pollinator habitat improvement, or restoration of natural communities (ecosystem restoration).**


Great spangled fritillaries on common milkweed


Bumble bee on purple coneflower

## General Specifications

### Site Selection:

- In remnant natural areas, other practices such as prescribed fire or canopy thinning can stimulate growth of the local native seeds already present.
- If the soil at the site has never been farmed or otherwise disturbed, practices that will release native seed sources may be more appropriate than establishing new conservation cover.
- Appropriate locations for Conservation Cover include odd or converted areas within farmlands, field borders, old fields with low plant diversity, logging decks, or areas where exotic plants have been removed (including pasture grasses).
- Sites should be inventoried in order to determine if this practice is appropriate.
- Where extensive exotic invasive plant infestations are present, this resource concern should be addressed before native plant establishment is attempted.

### Size:

***Wildlife habitat:*** The attractiveness of native habitat is maximized on sites > 1/2 acre in size and in buffers greater than 33 feet wide with a diversity of plants that provide food, structural cover, and nest sites. Larger habitat patches are more beneficial. Blocks of natives can be planted in order to connect existing natural habitats.

***Pollinator habitat:*** The attractiveness of pollinator habitat is increased on sites > 1/2 acre in size with > 45 percent forb cover. Creating habitat patches totaling 1 -2 acres in size for every 25 acres of cropland may also support natural enemies of crop pests in farmland areas. Stands less than ½ acre provide greater benefits when located within sight of another habitat patch. These same guidelines can be applied to forest lands where logging decks or other previously cleared areas are present.

***Ecosystem restoration:*** Use local southeastern ecotype plant materials. For natural community restoration, the size of areas planted should depend on site condition, species availability, and the scope of the project. In some cases, species can be hand-collected in an appropriate location and transferred to the site under restoration.

**Species Selection:** In all habitat improvement projects, plant species that originally grew in an area and are adapted to the climate, soils, and disturbances are also the most beneficial to animal species including native pollinators. Seeds or plants may be used for establishment.

***Wildlife habitat:*** Bunch or clump forming grasses provide nest sites, cover, and seeds. Forbs, especially legumes, provide seeds and fruit for wildlife as well as attracting the insects and larvae on which many mammals and birds feed.

***Pollinator habitat:*** It is important to provide nectar and pollen food resources throughout the growing season. Butterflies and moths also need host plants for their eggs and larvae. Bees use hollow stems and bunch grass clumps for egg-laying, as well as grass and forb structure for protection from rain and wind.


***Ecosystem restoration***: When restoring a natural community such as a longleaf pine savanna or Piedmont prairie, it is important not to introduce plant materials with genetic origins from outside the eco-region. These plants may overtake and displace the native flora thus reducing habitat quality and bio-diversity within the natural community. Only species with genetic origins from the Southeast shall be planted. To promote greater diversity, include numerous species.

## How many species to plant (SC NRCS practice components):

***Wildlife habitat***: A stand with a minimum of 3 native species of grasses (1 grass required) and/or wildflowers (forbs and legumes). Legumes are especially beneficial.

***Pollinator habitat:*** A stand with a minimum of 9 wildflower (forbs, legumes) species should be established, including at least three flowering species that bloom during each season (spring, summer, and fall). The stand should include a minimum of one native bunchgrass for a total of 10 or more species. Each species can make up to 20% (no more than 20% per species, especially grasses) of the mix. Refer to the pollinator and/or monarch habitat jobsheets for more details.

***Ecosystem restoration***: Include at least 10 local ecotype species in plantings. Plant lists found in this document and in the SC Native Seed Calculator show which species with local origins may be available. In Also see the vendor list for native and local ecotype plant availability.

**Which Plant Species**: Species mixtures for target site can be created with the SC NRCS Seed Calculator and Specification Sheet (EFOTG/Section IV/Tools: http://efotg.sc.egov.usda.gov/treemenuFS.aspx). Choose species from table in this document or those found in SC NRCS native beneficial plant lists. Many vendors will create a custom mix or carry native wildlife, pollinator, and southeastern ecotype seed mixtures.

**Amount:** The recommended seed planting rate to improve wildlife habitat or for natural community restoration (local ecotype) is **25 - 30 pure live seed** (PLS) per square foot. Pollinator habitat establishment requires **40–60 PLS** per square foot (upper end of range better if broadcasting). The only way to ensure PLS is to purchase seed that has been tested by a registered seed laboratory. **Most native seed vendors use PLS (clients should ask for PLS).**

Seed sold on a bulk pound basis may or may not provide the required seed per square foot. Only by calculating seeding rates using PLS can you be assured that you are planting correct amounts of seed. If seed is sold in bulk, use the "Bulk Calculator" in the SC Seed Calculator and enter the % viability (viability = germ + dormant + hard seed, vendor should provide percentages). The calculator will do the math and provide the number of seeds per square foot and the lbs. per acre of seed needed.

**Flowering trees and shrubs** can be included as nectar sources or to improve diversity**,** food resources, and wildlife habitat structure. Species lists are included in Table 5 and in the Native Seed Calculator. Plant trees about 12 to 20 feet apart, shrubs 6 to 12 feet apart. Tree shelters/ browse protection will aid in establishment.

**Adding Annuals:** Nurse crop seed and/or native annuals can be planted with the perennial plant materials to stabilize the soil, reduce weed growth, and to give an early indication of establishment success. Native annuals like small-flowered partridge pea, Indian blanket, lemon mint, and showy tickseed sunflower can be included as one of the minimum number of species required, while very low rates of nurse crop species such as oats, rye grain, buckwheat, and or millet can be added to the mix. Never use winter wheat, winter rye, perennial rye, or introduced clovers since some of these have properties that can suppress germination of planted seeds or can out-compete planted seedlings.

**Planting seedlings:** Live plants in the form of plugs, sprigs, tublings, bareroot, or containerized material can be used for species such as wiregrass. Plant seedlings in clumps of 10 to 20, 2-5 feet apart. Clumps can be situated about 25 feet apart with a goal of 1200 to 2000 plants per acre. This type of planting may require irrigation.

## Site Preparation:

**It is extremely important to *Control Competitive Vegetation Before Planting:***

Conventional seedbed preparation, prescribed burning, herbicide application or a combination may be needed to control competition prior to planting. Several steps are required successfully reduce competition when using herbicide, especially on difficult to eradicate bahiagrass, bermudagrass, or fescue stands**.** ***Recommendations listed in Table 1***

**Table 1.** Recommended options for controlling competing, non-desirable vegetation during plant establishment. Eastern Gama grass and some forbs/wildflowers may not be compatible with imazameth containing products (check label for compatibility). All herbicides shall be applied and used according to label recommendations and may slightly differ from that listed below. See the Clemson Pest Management Handbook for more details: http://www.clemson.edu/extension/rowcrops/pest/**.** *NRCS does not require specific herbicides by trade name and recommendations on herbicides and specifications on rate and timing should come from a Clemson extension agent.

| Competing species | Timing | Method |
|---|---|---|
| Old field (fennel, horseweed, broomsedge, crabgrass) | Summer and/or Fall | Mow late summer, allow vegetation to re-grow 1 foot, apply herbicide in September. The following year, treat competing vegetation with herbicide multiple times if or as needed in mid- spring, mid-summer, late summer to early fall and/or possibly mid-autumn prior to planting in fall or next spring (do not plant in field treated with "Atrazine" within 2 years). |
| Cropland | Spring | 1. Remove excess vegetation in fall or winter (mow or burn). 2. Apply tank mixture after vegetation has grown 4 to 6 inches. Tank Mixture: per acre in April – May: Apply 1.5 quarts glyphosate base product. May be tank-mixed with a glyphosate/imazameth mixture at a rate of 10.7 oz/acre. If imazameth alone is available, it can be applied instead of the glyphosate/imazameth mixture at a rate of 4-8 oz per acre. Follow all label instructions. A second application 4 - 6 weeks later with a germination inhibitor will be needed prior to planting. |
| Fescue (*Schedonorus phoenix)* | Fall and Spring | The first step in killing fescue is to mow the area in late summer for a fall herbicide application. If possible after mowing and prior to herbicide application, remove the cut vegetation by prescribed burn to provide a better seed bed and allow for better herbicide contact with growing vegetation. This application should occur after the remaining vegetation has re-grown 4 – 6 inches.<br>If needed for thick stands, a second or third herbicide application should be planned for the following year (spring and fall). All herbicide applications shall be made when vegetation is actively growing, so further mowing or burning may be necessary to stimulate new growth.<br>*On forest lands*, apply a glyphosate herbicide as a 5-percent solution in water (2 quarts per 10 gallons mix per acre) or when there are no concerns for surrounding plants, Arsenal AC* as a 1-percent solution (25 ounces per 20 gallons mix per acre) in spring.<br>*On noncroplands,* apply 10 to 12 ounces of Plateau* or 20 to 24 ounces of Journey* per 20 gallons mix per acre (consult the label for additives) in spring. Mixing Plateau or Journey with a glyphosate herbicide will improve control but may damage associated native plants. Vantage (sethoxydim), Poast® (sethoxydim), Assure® II (quizalofop), and Select® 2 EC (clethodim) may be useful on pastures, but they are usually more costly than a glyphosate mix with Plateau or Journey. **A second herbicide application is required for dense fescue where competition may not be controlled by one herbicide application. Also treat bermudagrass if found growing below fescue.** *Early spring burning, if repeated, inhibits fescue and encourages native warm-season grasses* |
| Bermudagrass *(Cynodon dactylon)* | Summer | **Bermudagrass is very competitive and difficult to control with a single application of most herbicides. Because of its aggressive nature and warm-season growth pattern, it is absolutely essential to completely eradicate bermudagrass before planting native warm-season grasses.** However, sites dominated by bermudagrass can be converted by applying labeled rates of imazapyr (e.g., Arsenal®, Chopper ®). Imazapyr applications for bermudagrass control are most effective if applied during July through September. If imazapyr is used, the application should be made a growing season prior to establishing native warm-season grasses. The residual soil activity of imazapyr will kill germinating native warm-season grasses if planted within six months (plus or minus) of application of imazapyr. Closely note label precautions if using near nontarget trees or shrubs. Imazapyr will kill hardwoods and should not be applied within two times the width of the drip line of any desirable hardwood trees. In areas that cannot be treated by imazapyr, apply a labeled rate of glyphosate (e.g., Roundup) after bermudagrass seedhead initiation. Glyphosate will not eradicate bermudagrass as effectively as imazapyr, and **multiple applications (2-4) of glyphosate will be required.** |

| Competing species | Timing | Method |
|---|---|---|
| Bahiagrass *(Paspalum notatum)* | Spring and Summer | Apply a labeled rate of metsulfuron methyl (e.g., Escort®) in spring after full green-up. Native warm season grasses are mostly tolerant of metsulfuron methyl, but observe applicable replanting intervals on the product label. Metsulfuron methyl can be absorbed through the roots, so be cautious of applications around desirable hardwood trees and shrubs. Closely note label indications if using near nontarget trees or shrubs. Applied at lower rates (less than 1 ounce per acre), metsulfuron methyl will probably not injure most desirable hardwood trees. However, if there is any doubt, do not apply within two times the width of the drip line of any desirable hardwood trees. In desirable hardwood areas that cannot be treated by metsulfuron methyl or if johnsongrass is also present, apply a labeled rate of imazapic (e.g., Plateau) or imazapic plus glyphosate (e.g., Journey) after bahiagrass has reached full green-up. These treatments may be adequate to release existing native warm-season grasses or to prepare a site for planting native warm-season grasses if bahiagrass is the only grass problem present. Be aware that herbicides containing glyphosate may kill native warm-season grasses if applied when they are actively growing. Another treatment option for areas that cannot be treated by metsulfuron methyl is application of a labeled rate of glyphosate after bahiagrass seedhead initiation. However, **multiple (2-4) glyphosate-only applications will likely be required to control bahiagrass**, and this treatment will also kill any desirable vegetation. If there is a significant presence of bermudagrass, it is best to treat the site as recommended below; otherwise, spot-treat bermudagrass if it occurs in patches. |
| Johnson grass *(Sorghum halepense)* | Summer or Fall | Thoroughly wet all leaves with one of the following herbicides in water with a surfactant (June to October with multiple applications applied to regrowth).<br>*Recommendation for mature grass control:* apply Outrider as a broadcast spray at 0.75 to 2 ounces per acre (0.2 to 0.6 dry ounces per 3-gallon mix) plus a nonionic surfactant to actively growing Johnsongrass. For hand-held and high-volume sprayers, apply 1 ounce of Outrider per 100 gallons of water plus a non-ionic surfactant at 0.25 percent. Outrider is a selective herbicide that can be applied over the top of other grasses to kill Johnsongrass, or apply Plateau as a 0.25-percent solution (1 ounce per 3-gallon mix) when plants are 18 to 24 inches (45 to 60 cm) tall or larger.<br>*Recommendation for seedling control:* apply Journey as a 0.3-percent solution (1.2 ounces per 3-gallon mix) before johnsongrass sprouts and when desirable species are dormant or apply a glyphosate herbicide as a 2-percent solution (8 ounces per 3-gallon mix). |
| No herbicide/ small areas | Spring, Summer Fall | Just prior to planting (for all these methods), excess vegetation should be cleared from the site to ensure good seed to soil contact. Burn or mow closely, but do not till just prior to planting (tilling exposes weed seeds, which generally require sunlight to germinate). For broadcasting, site should be free of vegetation, while for drilling, stubble is okay. Site preparation options: 1. Solarize vegetation on small areas with UV stabilized clear plastic, or smother with plywood, cardboard, or a thick layer of newspaper covered with leaves or grass clippings, leave for an entire growing season to kill plants underneath. 2. Till in early spring, then till once or twice more after 4-6 weeks. Note that tilling can destroy ground nests of bees, so avoid deep tillage, if possible. Plant a summer smother crop like buckwheat, sorghum-sudan grass, or millet. In fall, crimp planting to kill; then remove excess vegetation by burning or mowing closely. If weed competition is heavy, a fall smother crop of rye grain or oats can be planted. Tilling prior to planting should be avoided. Tilling is not recommended for slopes or erosion prone areas. |

**Plan for possible Herbicide Carryover: Carryover from herbicide treatments in prior years can pose a threat to new plantings. Seedlings are particularly sensitive to herbicide carryover. Herbicides such as glyphosate have very short persistence and generally do not pose a risk for carryover. Herbicides such as atrazine have medium to long persistence and can pose a risk of carryover. The persistence of herbicides is directly affected by factors such as soil pH and moisture. To assess risks before planting, read the herbicide label or contact the manufacturer for specific information on persistence.**

**References:**

**Miller, James H.; Manning, Steven T.; Enloe, Stephen F. 2010. *A management guide for invasive plants in southern forests*. Gen. Tech. Rep. SRS–131. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 120 p.** http://wiki.bugwood.org/Archive:MGIPSF

**Publication 2435, Native Grass Restoration in Mississippi, *Mississippi State University Extension Service, Mississippi State University. By Rick Hamrick, L. Wes Burger, Jeanne Jones, and Bronson Strickland.* http://msucares.com/pubs/publications/p2435.pdf**

**Roundstone Native Seed Establishment and Maintenance Guidelines: https://www.roundstoneseed.com/establishmenttips.asp**


Indian grass


Bee on Echinacea

## Seed Bed Preparation:

- Sites with significant vegetation. Prior to seeding, as much vegetation should be removed as possible by grazing, cutting and raking, or burning. For erodible sites, vegetation removal may need to be delayed until just prior to seeding or a cover crop can be utilized to hold the soil and then be killed just prior to seeding. Since this is a perennial planting, avoid cultivating close to seeding time so that weed seeds are not brought to the surface.
- Sites conventionally tilled. To prevent seed from becoming buried too deep, conventionally tilled sites need to be smoothed by disking and dragging. After smoothing, the site should be conditioned by using a culti-packer, roller, or other equipment to compact the soil surface.
- Crop field sites. To prevent bringing up weed seed, avoid tillage. Heavy crop residue may need to be burned, mowing and raked, or incorporated into the soil to ensure good seed to soil contact. Also, tillage may be needed to smooth out crop ridges. If convention tillage is required, the soil should be culti-packed or rolled prior to seeding.

**When to Plant:** Spring planting should occur prior to last frost (coastal plain- April 1, piedmont- April 15). Fall planting should be finished at least 6 weeks before hard-freezing weather occurs (coastal plain- Oct. 20, piedmont- Oct. 10). For dormant season planting, it is important to wait until the soil temperature has cooled to less than 55 degrees Fahrenheit (Nov.- mid Feb.). Fall or dormant season is recommended for forbs/wildflowers since seed germinates better after exposure to a period of cold temperature and moisture (stratification). On sites where weeds have been eliminated and are completely dead by fall, forb seed can be planted in late fall by hand or drill with no soil tillage (seed will work its way down as the soil freezes and thaws over winter). Mixtures of primarily warm-season grasses may do better if planted in the spring.

## Establishment Methods:

The site may be broadcast seeded, no-till drilled, or hand seeded. For pollinator habitat or high forb content plantings, broadcast seeding may be more successful since small seeds may be planted too deeply with a drill. Fertilizer or other soil amendments are not recommended. Good seed to soil contact is extremely important. **Never Plant seeds deeper than ¼ inch.**

***1. Broadcast seeding***. Conventionally tilled sites can be mechanically (broadcast spreader) or manually (push seeder, hand crank seeder, or by hand) broadcast-seeded, however, it is critical that the site surface be culti-packed or rolled prior to seeding and then again after seeding to press the seed into the soil. When broadcast seeding, it is best to broadcast at a half rate and seed over the area twice with the second pass at a right angle to the first pass to insure equal coverage. For small forb seed and light fluffy grass seed use a damp carrier such as pelletized lime, cat litter, sawdust, sand, soy hulls, cracked corn, etc. in order to facilitate good seed coverage. Use at least 3 times as much carrier as seed; or a 5 gallon bucket per 1,000 square feet is not too much to use. The more the seed is diluted, the better it will be distributed. Roll the site with a roller, or drive across it with a truck or tractor tires to firm the seed into the soil (if soil is wet, wait until it dries to roll).

***2. No-till seeding.*** Specialty warm-season grass drills are needed to seed other than conventionally tilled sites, especially if the seed is not de-bearded or contains harvest chaff. Some of these drills have features that compensate for the light fluffy seed and insure accurate seed depth placement. De-bearded seed and seed with the chaff removed can be drilled with conventional drills in some mixes. Specialty drills are recommended for large areas in conventional tilled sites due to other features normally included that aid in accurate seed placement. Carriers like oats, cracked corn, or rice hulls may be used to facilitate movement of fluffy and small seed through drill. Drills can also be used in sites prepared via herbicides only (to avoid disturbing competing weed seed). Seeds can be no-tilled directly though the thatch. On firm cultivated seed beds, roll after seeding.

**Meadowlark nest in native grass**

## Operation and Maintenance:

Planted stands should not be disturbed by the turning of machinery or driving within the stand. However, maintenance will be required in order to facilitate establishment and maintain desired species and structure. Monitoring and controlling weeds is very critical in the first and second years.

**FIRST YEAR:** Most native wildflower seeds take at least three weeks to germinate. Do not expect to see blooms the first or possibly even the second year. Supplementing your planting with a few annual wildflowers will give you a show of color the first year. A weed problem is normal in the first year. Pulling weeds can help but may dislodge wildflower seedlings.

- Mowing is the most effective method for controlling annual weed competition. If annual weeds are present, mow to about 8" once vegetation is about 12" tall. This allows light to reach the slower growing perennials, helps prevent annual weed seed development, and avoids smothering the desirable species with the cuttings (if allowed to grow taller). Mow several times as needed over the growing season if competition continues to be a problem.
- Spot spraying and hand rouging can be very effective for small areas or limited invasions of perennial or otherwise troublesome weeds.
- Wicking with glyphosate herbicide is very effective on tall weeds like johnsongrass and Nodding Thistle.

**SECOND YEAR**: Mow with blades set above 8 in., in early spring. It is beneficial to rake off the cuttings. Postponing mowing until early spring provides winter cover for wildlife. If weeds remain a problem in the second year, mow again in late spring or early summer (be aware that bird nests could be harmed; mow only when competition is severe). Mowing too late in the fall may destroy the seed heads of natives that feed birds in winter. However, if annual weeds are still predominant, it is better to prevent them from going to seed during the initial establishment. Unmaintained areas are beneficial as refugia (rotate management).

**ESTABLISHED STAND MAINTENANCE**

- Controlled burning is the preferred maintenance method. Rotational burning that covers the site over a three or more year period best supports wildlife. Burning removes thatch build-up, suppresses invasive woody growth, and invigorates the stand. Burning on a warm day, above 70 degrees F promotes more flowering stems. Burning should be implemented by the 3rd growing season.
- Mowing does not remove the buildup of prior year's biomass from the site and may lead to smothering thatch. Cutting and raking or haying to remove thatch build-up and invasive woody growth are viable alternatives to burning.
- Very light strip disking is sometimes conducted in thick stands, can help reduce grass density and encourage forb growth. However, it may also release weed seeds in the soil bank. Disking should not be used to manage sensitive areas such as remnant wiregrass or Piedmont prairie communities because it may destroy rare or sensitive plants in these systems.
- For small areas and isolated infestations of undesirable species, wicking, spot spraying, and hand rouging may be effective, but may not prevent smothering thatch build-up. Rouging involves the use of a special implement with a hooked and sharpened metal blade-end; the implement is pushed into the soil to sever the roots and the plant then is pulled from the soil.
- Maintenance practices must be adequate to control noxious and exotic invasive species.


**Precautions:** Pesticide and herbicide use on or near a pollinator planting can have significant negative effects on pollinator populations. Install pollinator habitat where chemical drift will not be an issue. Alternative means of addressing pest issues (mowing, haying, burning, etc.) should be used. It is important to note that some pollinator eggs or larvae may be killed during prescribed burns or other management actions. Therefore, no more than 1/3 - 1/2 of the stand should be mown, hayed, or burnt at a time. Growing season fire will maximize improvements to biodiversity and woody plant control. Rotate maintenance activities throughout managed areas to maximize spatial and temporal diversity.

## **Beneficial Native Wildflowers and Grasses (SC Native, available commercially)** - native grasses at end of list

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| Annual Phlox* | *Phlox drummondii* | sprg | sum | | A | P, CP | na | low | sun to part shade | pink, red |
| Arrowhead | *Sagittaria latifolia* | | sum | | P | ALL | OBL | high | full sun | white/yellow |
| Aster, Calico* | *Aster laterifolius/ Symphyotrichum lateriflorum* | | sum | fall | P | All | FAC | moderate | full sun | purple, white |
| Aster, Common Blue Wood (heartleaf aster)* | *Aster cordifolius / Symphyotrichum cordifolium* | | sum | | P | P | na | low | full sun | white, lavender |
| Aster, Eastern Showy (NC ecotype)* | *Aster spectabilis / Eurybia spectabilis (NC)* | | sum | fall | P | P | na | low | full sun | purple |
| Aster, False / White Doll's Daisy* | *Boltonia asteroides* | | sum | fall | P | P, CP | FACW | moderate | full sun | white |
| Aster, Health / Hairy White Oldfield* | *Aster pilosus / Symphyotrichum pilosum* | | sum | fall | P | All | FACW | moderate | sun to part shade | white |
| Aster, New England * | *Aster novae-angliae / Symphyotrichum novae-angliae* | | sum | fall | P | M | FACW | moderate | part shade | purple |
| Aster, New York * | *Aster novi-belgii / Symphyotrichum novi-belgii* | | | fall | P | P, CP | OBL | moderate | sun to part shade | blue |
| Aster, Purple Stemmed* | *Aster puniceus / Symphyotrichum puniceum* | | | fall | P | M, P | OBL | high | full sun | purple |
| Aster, Silverleaf/Narrowleaf Silkgrass | *Pityopsis graminifolia* | | sum | fall | P | All | UPL | moderate | sun to part shade | yellow |
| Aster, Smooth Blue* | *Aster laevis / Symphyotrichum laeve* | | sum | fall | P | All | na | moderate | part sun | blue |
| Aster, White Wood | *Aster divaricatus / Eurybia divaricata* | | | fall | P | M, P | na | low | shade, part shade | white |
| Aster, White/Flat-Topped /Parasol Whitetop | *Aster umbellatus / Doellingeria umbellata* | | sum | fall | P | CP | FACW | moderate | sun to part shade | white |
| Beard Tongue, Appalachian* (SC ecotype) | *Penstemon laevigatus (SC)* | sprg | sum | | P | All | FAC | high | full sun | purple |
| Beard Tongue, Eustis Lake/Slender * (NC ecotype) | *Penstemon australis* | sprg | sum | | P | ALL | FACU | low | part shade | lavender |
| Bear's Foot | *Smallanthus uvedalius* | | sum | | P | ALL | na | moist to dry | light shade to full sun | yellow |
| Beggarsticks, Bearded/Showy Tickseed* (NC, SC ecotypes) | *Bidens aristosa (SC, NC)* | | sum | fall | A | All | FACW | moderate to high | full sun or partial shade | yellow |
| Beggarsticks, Devil's/Tickseed Sunflower* | *Bidens frondosa* | | sum | fall | A | ALL | FACW | high | sun to part shade | yellow |
| Blazing Star, Elegant* (GA ecotype) | *Liatris elegans (GA)* | | | fall | P | P, CP | na | low | full sun | pink |
| Blazing Star, Grass-leaf* | *Liatris graminifolia / L. pilosa* | | sum | | P | All | na | low | full sun | purple |

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Blazing Star, Marsh or Spiked*(FL ecotype) | *Liatris spicata (FL)* | | sum | fall | P | M, P | na | moderate | part shade to sun | pink, purple |
| Blazing Star, Rough or Tall* | *Liatris aspera* | | sum | fall | P | P, CP | na | low to moderate | full sun | purple |
| Blazing Star, Scaly* (VA ecotype) | *Liatris squarossa (VA)* | | sum | | P | All | na | low | full sun | purple |
| Blazing Star, Slender* | *Liatris gracilis* | | sum | fall | P | CP | FACU | dry to moist | full sun | purple |
| Blue Mistflower* (VA ecotype) | *Eupatorium coelestinum / Conoclinium coelestinum* | | sum | fall | P | All | FAC | moderate | sun to part shade | blue, purple |
| Blue Vervain* | *Verbena hastata* | | sum | fall | P | ALL | FAC | moist to wet | sun to shade | purple, blue |
| Blue-eyed Grass, Narrowleaved* | *Sisyrinchium angustifolium* | sprg | | | P | All | FAC | moderate | sun to part shade | blue |
| Boneset* (FL ecotype) | *Eupatorium perfoliatum (FL ecotype)* | | | fall | P | All | FACW | moderate to high | full sun or partial shade | white |
| Butterfly Pea, Spurred (legume) vine | *Centrosema virginianum* | | sum | | P | All | na | low | full sun | purple |
| Cardinal Flower | *Lobelia cardinalis* | | sum | fall | P | All | FACW | high | part sun to shade | red |
| Columbine, Red * | *Aquilegia canadensis* | sprg | sum | | P | All | FACU | dry to moist | part shade | red, orange |
| Common Ragweed | *Ambrosia artemisiifolia (wildlife value, low pollinator value)* | | sum | | A | All | FACU | low | sun to shade | green |
| Coneflower, Clasping | *Rudbeckia amplexicaulis* | sprg | sum | | P | CP | FAC | dry to moist | full sun to part shade | yellow |
| Coneflower, Orange (VA ecotype) | *Rudbeckia fulgida (VA)* | | sum | fall | P | All | FAC | moderate | full sun | yellow |
| Coneflower, Purple * | *Echinacea purpurea* | | sum | | P | All | na | moderate | full sun | purple |
| Coreopsis, Greater* (AL ecotype) | *Coreopsis major (AL)* | sprg | sum | | P | All | na | low to moderate | full sun | yellow |
| Coreopsis-Goldenmane Tickseed* (FL ecotype) | *Coreopsis basalis (FL)* | | sum | | A | P, CP | na | low | full sun | yellow/red |
| Coreopsis-Lance Leaved* (NC ecotype) | *Coreopsis lanceolata (NC)* | sprg | sum | | P | All | UPL | low | part shade | yellow |
| Coreopsis-Largeflower Tickseed* (GA ecotype) | *Coreopsis grandiflora (GA)* | sprg | sum | | P | All | na | low | full sun | yellow |
| Coreopsis-Plains* | *Coreopsis tinctoria* | sprg | sum | | A | All | FAC | high | sun to part shade | yellow |
| Coreopsis-Tall* (AL ecotype) | *Coreopsis tripteris (AL)* | | sum | fall | P | M, P | FAC | moderate | part shade | yellow |
| Coreopsis-Whorled/Threadleaf Tickseed* (SC, VA ecotype) | *Coreopsis verticillata (SC, VA)* | sprg | sum | | P | P | na | low to moderate | full sun | yellow |

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| Crimson-eyed Rose Mallow | *Hibiscus moscheutos* | | sum | | P | All | OBL | high | full sun | white |
| Culiver's Root* | *Veronicastrum virginicum* | | sum | fall | P | M, P | FACW | dry to wet | full sun | white, pink, blue |
| False Indigo / River Locust * | *Amorpha fruticosa* | sprg | sum | | P | All | FACW | moderate | full sun to part shade | purple |
| False Indigo, Clusterspike* (NC ecotype) | *Amorpha herbacea (NC)* | sprg | sum | | P | P, CP | FAC | low | sun to part-shade | pink, purple |
| Golden Alexanders* | *Zizia aurea* | sprg | sum | | P | All | na | moderate | full sun to part shade | yellow |
| Goldenrod, Anise-scented* (GA ecotype) | *Solidago odora* | | sum | fall | p | All | na | moderate | full sune | yellow |
| Goldenrod, Early* | *Solidago juncea* | sprg | sum | | P | M | na | dry to moist | sun to shade | yellow |
| Goldenrod, Erect* | *Solidago erecta* | | sum | fall | P | All | na | dry to moist | full sun | yellow |
| Goldenrod, Flat top / Lance-Leaved* | *Euthamia graminifolia* | | sum | fall | P | CP | FAC | moist | full sun | yellow |
| Goldenrod, Gray* (VA, PA ecotypes) | *Solidago nemoralis (VA. PA)* | | sum | | P | All | na | moderate | full sun | yellow |
| Goldenrod, Pinebarren* (FL ecotype) | *Solidago fistulosa (FL)* | | sum | | P | CP | FAC | moderate | full sun | yellow |
| Goldenrod, Rigid* | *Solidago rigida or Oligoneuron rigidum* | | sum | fall | P | P | FACU | moderate | sun to part shade | yellow |
| Goldenrod, Rough-Leaved* | *Solidago patula* | | | fall | P | All | OBL | high | sun to part shade | yellow |
| Goldenrod, Showy* (GA, WV ecotypes) | *Solidago speciosa (GA, WV)* | | sum | fall | P | All | na | high | part shade | yellow |
| Goldenrod, Tall* | *Solidago altissima* | | | fall | P | All | FACU | moderate | part shade | yellow |
| Goldenrod, Wand* | *Solidago stricta* | | | fall | P | P, CP | OBL | moist to wet | full sun | yellow |
| Goldenrod, Wreath* | *Solidago caesia* | sprg | | | P | All | FACU | moderate | sun to part shade | yellow |
| Goldenrod, Wrinkle-Leaved * | *Solidago rugosa* | | sum | fall | P | All | FAC | moderate | sun to part shade | yellow |
| Grey headed coneflower (mid-west species, not preferered) | *Ratibida pinnata* | sprg | sum | fall | P | P | na | moderate | full sun | yellow |
| Illinois Bundleflower (legume) | *Desmanthus illinoensis (wildlife value, low pollinator value)* | | sum | | P | All | FAC | moderate | full sun | white, yellow |
| Indian Blanket/Blanketflower, Annual* | *Gaillardia pulchella* | sprg | sum | fall | A | P, CP | - | low to moderate | full sun | red |
| Indianhemp/Dogbane* | *Apocynum cannabinum* | sprg | sum | | P | All | FACU | moderate | sun to part shade | white |
| Iris, Blue Flag | *Iris virginica* | sprg | | | P | All | OBL | high | sun to shade | purple |

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| Ironweed, Giant* (FL ecotype) | *Vernonia gigantea or altissima (FL)* | | sum | fall | P | P, CP | FAC | moderate | sun to shade | purple |
| Ironweed, New York* (NC ecotype) | *Vernonia noveboracensis (NC)* | | sum | fall | P | All | FAC | moderate | sun to shade | purple |
| Ironweed, Stemless* (SC ecotype) | *Vernonia acaulis (FL)* | | sum | | P | All | na | low | sun to part shade | purple |
| Ironweed, Tall* (SC ecotype) | *Vernonia angustifolia (SC)* | | sum | fall | P | P, CP | FACU | moderate | sun to part shade | purple |
| Joe Pye Weed, Trumpetweed* | *Eupatorium fistulosum (Eutrochium fistulosum)* | | sum | fall | P | All | FAC | moderate | part shade | pink |
| Lespedeza, Hairy (legume) | *Lespedeza hirta* | | sum | fall | P | All | na | low | full sun | white |
| Lespedeza, Roundhead* (legume) | *Lespedeza capitata* | | sum | fall | P | All | FACU | low | full sun | yellow |
| Lespedeza, Slender /Bushclover (legume) VA ecotype | *Lespedeza virginica (VA)* | | sum | fall | P | All | na | low | part sun to shade | pink |
| Lobelia, Downy (SC ecotype) | *Lobelia puberula (SC)* | | sum | fall | P | All | OBL | high | part sun to shade | Blue |
| Lobelia, Great Blue | *Lobelia silphilitica* | | sum | fall | p | M, P | FACW | moist, wet | sun to shade | Blue |
| Meadow Beauty (Virginia, NC ecotype) | *Rhexia virginica (NC)* | sprg | sum | fall | P | All | FACW | high | part shade | pink, purple |
| Meadow Beauty, Maryland (NC ecotype) | *Rhexia mariana (NC)* | | sum | fall | P | All | FACW | moderate to high | part shade | pink, white |
| Milkvetch, Canadian | *Astragalus canadensis* | sprg | sum | | P | All | FAC | moderate | sun to part shade | white |
| Milkweed, Butterfly * | *Asclepias tuberosa* | | sum | | P | All | na | low | full sun | orange |
| Milkweed, Common * | *Asclepias syriaca* | | sum | | P | All | na | dry to moist | full sun | pink |
| Milkweed, Eastern Swamp * | *Asclepias incarnata* | | | fall | P | All | OBL | high | full sun | pink |
| Mint, Clustered Mountain* | *Pycnanthemum muticum* | | sum | | P | All | FAC | moderate | sun to part shade | white |
| Mint, Lemon | *Monarda citriodora* | | sum | | A | P, CP | na | low to moderate | full sun to partial shade | purple |
| Mint, Ohio / Downy Pagoda (NC ecotype) | *Blephilia ciliata (NC)* | sprg | sum | | P | P | na | low | part shade, shade | blue, purple |
| Mint, Slender Mountain* | *Pycnanthemum tenuifolium* | | sum | fall | P | All | FACW | dry to moist | sun to part shade | white |
| Mint, Spotted Bee Balm* (SC, NC ecotypes) | *Monarda punctata (SC, NC)* | | sum | | A | All | FAC | low | full sun | purple |
| Mint, Wild Bergamot* | *Monarda fistulosa* | | sum | | P | M, P | na | high | part sun | pink |
| Monkey Flower | *Mimulus ringens* | | sum | fall | P | All | OBL | moist to wet | full sun | purple |

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodding Onion * | *Allium cernuum* | sprg | sum | | P | P | FACU | dry-moist | full sun to part shade | white, pink |
| Partridge Pea-Large Flowered* (legume) NOT Lark or Comanche | *Cassia fasciculata / Chamaecrista fasciculata* | | sum | fall | A | All | FACU | low | full sun or light shade | yellow |
| Partridge Pea-Small Flowered* (legume) | *Cassia nictitans / Chamaecrista nictitans* | | sum | fall | A | All | FACU | low | full sun or light shade | yellow |
| Passion Flower (vine) | *Passiflora incarnata* | sprg | sum | fall | P | All | na | low to moderate | sun to part shade | purple |
| Pickerelweed | *Pontederia cordata* | sprg | | | P | All | OBL | high | full sun | purple |
| Prairie clover, Summer Farwell (FL ecotype) | *Dalea pinnata (FL ecotype)* | | sum | fall | P | P, CP | na | dry | full sun | white |
| Prairie clover, White | *Dalea candida* | sprg | sum | fall | P | All | na | moderate | full sun | white |
| Primrose, Evening * | *Oenothera biennis* | | sum | fall | P | All | FACU | low to moderate | full sun to light shade | yellow |
| Primrose, Showy * | *Oenothera speciosa* | sprg | sum | | P | All | na | low | full sun | yellow |
| Rattlesnake Master* (SC, FL ecotype) | *Eryngium yuccifolium (SC, FL)* | | sum | | P | All | FAC | low to moderate | sun to part shade | white |
| Rattlesnake Master, Marsh* (SC Ecotype) | *Eryngium aquaticum var. aquaticum* | sprg | sum | fall | P | CP | OBL | high | part shade | lavender, white |
| Rosinweed, Prairie / Prairie Dock* | *Silphium terebinthinaceum* | | sum | fall | P | P | FACU | moist to wet | full sun | yellow |
| Rosinweed, Starry* (SC, FL ecotypes) | *Silphium asteriscus (SC, FL)* | | sum | fall | P | All | na | moderate | full sun | yellow |
| Rosinweed, Whorled* | *Silphium trifoliatum* | | sum | fall | P | P | na | low to moderate | part shade | yellow |
| Seed Box | *Ludwigia alternifolia* | | sum | fall | P | All | FACW | moderate to high | full sun | yellow |
| Senna, Wild/Maryland* (legume) | *Cassia marilandica / Senna marilandica* | | sum | | P | All | FAC | low to high | full sun to light shade | yellow |
| Sensitive Briar | *Mimosa quadrivalvis (Mimosa microphylla)* | sprg | sum | | P | All | na | low | full sun | pink |
| Smartweed, Pennsylvania /Pinkweed | *Polygonum pensylvanicum (Persicaria pensylvanica)* | sprg | | | P | All | FACW | high | sun | red, pink |
| Snakeroot, White | *Eupatorium rugosum (Ageratina altissima)* | | sum | fall | P | All | na | moist | shade, part shade | white |
| Sneezeweed, Common* (FL, VA, PA ecotypes) | *Helenium autumnale (FL, VA, PA)* | | | fall | P | All | FACW | moderate | full sun | yellow |
| Spiderwort, Ohio /Bluejacket | *Tradescantia ohiensis* | sprg | sum | | P | P, CP | FAC | low | shade | purple |
| Spiderwort, Virginia (VA, PA ecotype) | *Tradescantia virginiana (PA, VA)* | sprg | | | P | All | FAC | moderate | part shade | purple |
| Spiderwort, Zigzag (VA ecotype) | *Tradescantia subaspera (VA)* | sprg | sum | | P | M, P | na | low | part shade | blue |

| **Common Name** (* preferred by monarchs) | ***Scientific name*** | **bloom** | **bloom** | **bloom** | **type** | **region** | **wetland indicator** | **moisture needs** | **sunlight needs** | **flower color** |
|---|---|---|---|---|---|---|---|---|---|---|
| Sunflower, Ox Eye * | *Heliopsis helianthoides* | sprg | sum | fall | P | All | na | low to moderate | full sun | yellow |
| Sunflower, Swamp/Narrow-Leaf (SC, FL, AL, MD ecotypes) | *Helianthus angustifolius (SC, FL, AL, MD)* | | sum | fall | P | All | FAC | moderate | full sun or partial shade | yellow |
| Sunflower, Thin-Leaf | *Helianthus decapetalus* | | sum | fall | P | M, P | na | high | sun to shade | yellow |
| Sunflower, Woodland | *Helianthus divaricatus* | | sum | | P | All | na | low | sun to shade | yellow |
| Susan, Black-Eyed* | *Rudbeckia hirta* | sprg | sum | | P | All | FACU | low to moderate | full sun | yellow |
| Susan, Brown-Eyed* | *Rudbeckia triloba* | sprg | sum | fall | P | M, P | FACU | moist to dry | sun to part shade | yellow |
| Thoroughwort, Lanceleaf or Hyssop-Leaved | *Eupatorium hyssopifolium* | sprg | sum | fall | P | All | na | moderate | full sun | white |
| Thoroughwort, Roundleaf | *Eupatorium rotundifolium* | | sum | | P | All | FAC | dry to wet | full sun | white |
| Tick Trefoil, Dixie / Florida Beggarweed (legume) | *Desmodium tortuosum* | | sum | fall | A | P, CP | na | low | full sun | purple |
| Tick Trefoil, Panicle-leaf (legume) | *Desmodium paniculatum* | | sum | | P | All | FACU | low | sun to part shade | purple |
| Tick-Trefoil, Florida (legume) | *Desmodium floridanum* | | sum | fall | P | CP | na | low to moderate | full sun | pink |
| Tick-Trefoil, Showy (legume) | *Desmodium canadense* | | | fall | P | All | FAC | low to high | sun to part shade | purple |
| Virgin's Bower (vine) (PA ecotype) | *Clematis virginiana (PA)* | | sum | fall | P | All | FAC | moderate | part shade | white |
| Wild Blue Lupine* (legume) | *Lupinus perennis* | sprg | | | P | P, CP | na | low | full sun | blue |
| Wild Indigo - Catbell * (legume) | *Baptisia perfoliata* | sprg | | | P | P, CP | na | low | full sun | yellow |
| Wild Indigo - Horsefly Weed* (legume) | *Baptisia tinctoria* | | sum | | P | All | na | low | full sun | yellow |
| Wild Indigo, Blue* (legume) -WV ecotype | *Baptisia australis* | sprg | | | P | M, P | na | moderate | full sun | purple, blue |
| Wild Indigo, Spiked* (legume) -NC, SC ecotypes | *Baptisia albescens (SC, NC ecotypes)* | sprg | | | P | All | na | low | sun to part shade | white |
| Wild Indigo, White* (legume) | *Baptisia alba* | sprg | | | P | All | FAC | moderate | full sun | white |
| | | | | | | | | | | |

## Beneficial Native Grasses, Sedges, and Rushes (SC Native, available commercially)

| Common Name | *Scientific name* | region | wetland Ind | moisture needs | sunlight needs |
|---|---|---|---|---|---|
| Bentgrass, Upland | *Agrostis perennans* | All | FACU | moderate to high | part shade |
| Bentgrass, Winter (NC ecotype) | *Agrostis hyemalis (NC)* | All | FAC | moist-wet | part shade |
| Bluestem, Big (grass)-other ecotype, not preferred | *Andropogon gerardii* | All | FAC | moist to dry | full sun |
| Bluestem, Big (grass)-NC, SC, AL ecotype | *Andropogon gerardii* | All | FAC | moist to dry | full sun |
| Bluestem, Bushy (grass) | *Andropogon glomeratus* | CP | FACW | moist to wet | full sun |
| Bluestem, Little (grass) | *Schizachyrium scoparium (Andropogon scoparius)* | All | FACU | dry to moist | full sun |
| Bluestem, Little (grass) -NC ecotype | *Schizachyrium scoparium (Andropogon scoparius)* | All | FACU | dry to moist | full sun |
| Bluestem, Splitbeard (grass) | *Andropogon ternarius* | P, CP | FACU | dry | sun to part shade |
| Bulrush, Green | *Scirpus atrovirens* | M, P | OBL | moist to wet | full sun |
| Bulrush, Rufous | *Scirpus pendulus* | P, CP | OBL | moist to wet | full sun |
| Bulrush, Woolgrass | *Scirpus cyperinus* | All | OBL | wet, high | sun to part shade |
| Deer Tongue Rosettegrass (grass) | *Panicum clandestinum (Dichanthelium clandestinum)* | All | FACW | dry | sun to shade |
| Dropseed, Pineywoods(grass) | *Sporobolus junceus* | P, CP | na | dry | part shade |
| Dropseed, Rough (grass) | *Sporobolus clandestinus* | P, CP | na | low to moderate | sun to part shade |
| Eastern Gamagrass (grass) | *Tripsacum dactyloides* | All | FAC | moist to wet | full sun |
| Fowl Manna Grass | *Glyceria striata* | All | OBL | moist | sun to shade |
| Indiangrass, Lopsided | *Sorghastrum secundum* | CP | FACU | dry | full sun |
| Indiangrass, Nodding or Slender (NC ecotype) | *Sorghastrum elliotii (NC)* | All | na | low | sun to part shade |
| Indiangrass, Yellow (GA ecotype) | *Sorghastrum nutans (Americus)* | All | FACU | dry to wet | full sun |
| Indiangrass, Yellow (NC ecotype) | *Sorghastrum nutans (Suther)* | All | FACU | dry to wet | full sun |
| Indiangrass, Yellow (PA ecotype) | *Sorghastrum nutans* | All | FACU | dry to wet | full sun |
| Lovegrass, Purple | *Eragrostis spectabilis* | All | FACU | dry to wet | full sun |
| Muhly Grass (Hairawn Muhly) -FL ecotype | *Muhlenbergia capillaris (FL)* | P, CP | FACU | moist to wet | full sun |
| Nimblewell | *Muhlenbergia scheberii* | All | FAC | low to moderate | shade to part shade |
| Panicum, Beaked or Fall (grass) -SC, GA, FL ecotypes | *Panicum anceps (SC, FL, GA ecotype)* | All | FAC | moist to wet | part shade |
| Panicum, Red Top | *Panicum rigidulum* | All | FACW | high | full sun |
| Purple Top (grass) | *Tridens flavus* | All | FACU | dry | full sun |
| Purple Top (grass) NC, VA, AL, FL, GA ecotypes | *Tridens flavus (Suther or other local ecotype)* | All | FACU | dry | full sun |
| Rush, Bog | *Juncus biflorus* | P, CP | FACW | moderate to high | shade to part shade |
| Rush, Path/Poverty | *Juncus tenuis* | All | FAC | moderate | sun to part shade |
| Rush, Soft/Common | *Juncus effusus* | All | OBL | moderate to high | full sun |
| Sedge, Blunt Broom | *Carex scoparia* | M, P | FACW | moist to wet | shade to part shade |

| **Sedge, Fox** | ***Carex vulpinoidea*** | **All** | **FACW** | **moist to** wet | **shade to** part shade |
|---|---|---|---|---|---|
| Sedge, Frank's | *Carex frankii* | All | OBL | moist to wet | part shade |
| Sedge, Fringed/Nodding | *Carex crintita* | All | FACW | moist to wet | shade to part shade |
| Sedge, Hop | *Carex lupulina* | All | OBL | moist to wet | part shade |
| Sedge, Shallow | *Carex lurida* | All | OBL | moist to wet | part shade |
| Sedge, Squarrose | *Carex squarrosa* | P, CP | FACW | moist to wet | shade to part shade |
| Sedge, Yellowfruit | *Carex annectens* | All | FACW | moderate to high | sun to part shade |
| Switchgrass, Carthage (NC) | *Panicum virgatum* | M.P | FAC | moist to dry | full sun |
| Switchgrass, Nebraska 28 - small stature | *Panicum virgatum* | All | FAC | moist to dry | full sun |
| Switchgrass, Shelter (WV) | *Panicum virgatum* | M | FAC | moist to dry | full sun |
| Switchgrass, Southeast ecotype | *Panicum virgatum* | All | FAC | moist to dry | full sun |
| Tick Trefoil, Perplexed (legume) | *Desmodium perplexum* | All | na | low to moderate | sun to part shade |
| Toothache Grass | *Ctenium aromaticum* | P, CP | FACW | moist to wet | part shade |
| Wild Rye, Bottlebrush (grass) | *Elymus histrix* | P | na | wet to moist | shade |
| Wild Rye, Canada (grass) | *Elymus canadensis* | All | FAC | moist to dry | sun to shade |
| Wild Rye, Riverbank (grass) | *Elymus riparius* | P, CP | FACW | wet to moist | sun to shade |
| Wild Rye, Silky/Hairy (grass) | *Elymus villosus* | ALL | FACU | wet to dry | shade, part shade |
| Wild Rye, Virginia (grass) | *Elymus virginicus* | All | FAC | dry | sun to shade |
| Wiregrass, Northern, Pineland Threeawn | *Aristida stricta* | CP | FAC | dry to wet | parrt |
| Wood Oats, River Oats/Indian (grass) NC ecotype | *Chasmanthium latifolium (NC)* | All | FAC | moist | sun to shade |
| Woodoats, Longleaf (grass) | *Chasmanthium sessiliflorum* | All | FAC | moderate | full sun |
| Woodoats, Slender (grass) | *Chasmanthium laxum* | All | FACW | moderate | sun to shade |

Blazing star, goldenrod, plume grass

Rattlesnake master, butterfly milkweed, Eastern Gama grass

Slender lespedeza and goldenrod

## Table 4: Native Woody Species to plant or promote for the benefit of Pollinators

| Common Name | Common Name | Form | Bloom months | Bloom season |
|---|---|---|---|---|
| | | | | |
| Coral Bean (legume) | *Erythrina herbacea* | shrub | Mar-Nov | Spr-Fall |
| Dwarf Pawpaw | *Asimina parviflora* | shrub | April | Spring |
| hawthornes | *Crataegus spp.* | shrub | Mar-May | Spring |
| huckleberries | *Gaylussacia spp. (frondosa, dumosa)* | shrub | Apr-June | Spring |
| Virginia Willow | *Itea virginica* | shrub | April-June | Spring |
| Fetterbush | *Lyonia lucida* | shrub | Mar-May | Spring |
| Wax Myrtle | *Morella cerifera (= Myrica cerifera)* | shrub | March-April | Spring |
| Mock-orange | *Philadelphus hirsutus or pubescens* | shrub | Apr-June | Spring |
| Wild/American plum | *Prunus americana* | shrub | Mar-Apr | Spring |
| Chickasaw Plum | *Prunus angustifolia* | shrub | Feb-May | Spring |
| Hog Plum | *Prunus umbellata* | shrub | Mar-Apr | Spring |
| Choke cherry | *Prunus virginiana* | shrub | Apr-June | Spring |
| **Wild** Azalea species | *Rhododendron spp. (arborescens, atlanticum, calendulaceum, canescens, carolinianum, catawbiense, cumberlandense, minus, viscosum)* | shrub | March-June | Spring |
| Swamp Rose | *Rosa palustris* | shrub | May-June | Spring |
| Raspberry, Blackberry | *Rubus spp.* | shrub | Apr-June | Spring |
| Elderberry | *Sambucus canadensis* | shrub | May-June | Spring |
| Blueberries | *Vaccinium spp.* | shrub | Apr-June | Spring |
| Viburnums (native species) | *Viburnum spp.* | shrub | Apr-June | Spring |
| Groundsel | *Baccharis halmifolia* | shrub | Aug-Oct | Sum-Fall |
| False indigobush/leadplant | *Amorpha spp.* | shrub | June-July | Summer |
| Beauty berry | *Callicarpa americana* | shrub | June-July | Summer |
| New Jersey tea | *Ceanothus spp.* | shrub | June-July | Summer |
| Buttonbush | *Cephelanthus occidentalis* | shrub | June-Aug | Summer |
| Sweet pepperbush | *Clethra alnifolia* | shrub | June-July | Summer |
| Oak-leaf Hydrangea | *Hydrangea quercifolia* | shrub | June-July | Summer |
| Ninebark | *Physocarpus opulifolius* | shrub | May-June | Spring |
| native Holly species (American, Yaupon, Dahoon, gallberry, winterberry, possumhaw) | *Ilex spp. (opaca, vomitoria, cassine, glabra, verticillata, decidua,* | shrubs/trees | Mar-June | Spring |
| Red buckeye | *Aesculus pavia* | small tree | Apr-May | Spring |
| Painted Buckeye | *Aesculus sylvatica* | small tree | April | Spring |
| Redbud | *Cercis canadensis* | small tree | Mar-May | Spring |
| Fringe-tree | *Chionanthus virginicus* | small tree | Apr-May | Spring |

| Table 4 (continued): Native Woody Species to plant or promote for the benefit of Pollinators | | | | |
|---|---|---|---|---|
| **Common Name** | ***Scientific Name*** | **plant form** | **Bloom Months** | **Bloom time** |
| Dogwoods | *Cornus spp.* | small tree | Mar-June | Spring |
| Silverbell | *Halesia caroliniana* | small tree | April | Spring |
| Southern crabapple | *Malus angustifolia* | small tree | Apr-May | Spring |
| Black willow | *Salix nigra* | small tree | Mar-Apr | Spring |
| Devil's-walking-stick | *Arailia spinosa* | small tree | June-Aug | Summer |
| Winged sumac | *Rhus copallinum* | small tree | July-Sept | Summer |
| Smooth sumac | *Rhus glabra* | small tree | May-July | Summer |
| Loblolly Bay | *Gordonia lasianthus* | tree | May-Nov | Spr-Fall |
| Maple (red, silver, sugar) | *Acer spp.* | tree | Jan-May | Spring |
| Serviceberry | *Amelanchier spp.* | tree | Apr-May | Spring |
| Paw Paw | *Asimina triloba* | tree | Arp-May | Spring |
| Hickory | *Carya spp.* | tree | April | Spring |
| Persimmon | *Diospyros virginiana* | tree | May-June | Spring |
| Tulip poplar | *Liriodendron tulipifera* | tree | April-June | Spring |
| Southern Magnolia | *Magnolia grandiflora* | tree | Apr-June | Spring |
| Umbrella Magnolia | *Magnolia tripetala* | tree | Apr-June | Spring |
| Swamp tupelo | *Nyssa biflora* | tree | April-June | Spring |
| Black gum/tupelo | *Nyssa sylvatica* | tree | April-June | Spring |
| Red or Black chokeberry | *Photinia (Aronia) pyrifolia or melanocarpa* | tree | May | Spring |
| Wild Black Cherry | *Prunus serotina* | tree | Mar-June | Spring |
| Black locust | *Robinia pseudoacacia* | tree | Apr-June | Spring |
| linden, basswood | *Tilia americana* | tree | June | Spring |
| Ti-Ti | *Cyrilla racemiflora* | tree | May-July | Spr-Sum |
| Sweetbay Magnolia | *Magnolia virginiana* | tree | Apr-July | Spr-Sum |
| American Snowbell | *Styrax americanus* | tree | Apr-July | Spr-Sum |
| Sourwood | *Oxydendrum arboreum* | tree | June-July | Summer |
| Cabbage Palm | *Sabal palmetto* | tree | June-July | Summer |
| Cross vine | *Bignonia capreolata* | vine | Apr-May | Spring |
| Coral honeysuckle | *Lonicera sempervirena* | vine | Mar-July | Spr-Sum |
| Trumpet creeper | *Campsis radicans* | vine | June-July | Summer |
| Virginia creeper | *Parthenocissus quinquefolia* | vine | May-July | Summer |

# Summaries

| Table 5. Summary of minimum requirements for native species Conservation Cover projects | | | |
|---|---|---|---|
| **Project/Goal** | **Species** | **Planting Rate (seeds)** | **Size** |
| **Wildlife Habitat** | Minimum 3 native grasses and/or forbs* (1 must be a grass for structural qualities and for competition suppression) | 30-40 seeds per sq. ft. | >1/2 ac. ( > 33 ft. wide strip recommended if buffer for nesting birds) |
| **Pollinator Habitat** | Minimum 10 species: 9 forbs* covering 3 seasons + 1 grass (<20% of mix) | 40-60 seeds per sq. ft. (***use high end of range if seed broadcast)*** | >1/2 ac, >45% forbs*, 1-2 acres per 25 acres of land |
| **Ecosystem Restoration with local ecotype plant materials** | Minimum 10 species of local origin, or other suitable for target natural community | 25-30 or more seeds per sq. ft. | Project dependent |

*"Forbs" include flowering trees/shrubs known to support pollinators and wildlife

| Table 6. Summary plant material spacing recommendations | | | |
|---|---|---|---|
| **Plant form** | **Wildlife Habitat** | **Pollinator Habitat** | **Local Ecotype Plant Materials** |
| Trees | 12 x 12 feet to 20 x 20 feet based on tree size at maturity | 12 x 12 feet to 20 x 20 feet based on tree size at maturity | Project dependent |
| Shrubs | 6 x 6 feet to 12 x 12 feet based on shrub size at maturity | 6 x 6 feet to 12 x 12 feet based on shrub size at maturity | Project dependent |
| Herbs: plugs (wiregrass or other grasses/wildflowers), tublings, sprigs, bareroot or container | 1200-1500 per acre in clumps of 10-20 plants at 2-5 foot spacing, clumps about 25 feet apart | 1500-2000 per acre in clumps of 10-20 plants at 2-5 foot spacing, clumps about 25 feet apart | 1200-2000 per acre in clumps of 10-20 plants at 2-5 foot spacing, clumps about 25 feet apart |

| Table 7. Summary Planting Dates | | | |
|---|---|---|---|
| **Time** | **From** | **To** | **Recommended for** |
| **Frost seeding** | February 1 | March 15 | Native grasses, wildflowers |
| **Spring seeding** | March 15 | June 1 | Native grasses |
| **Fall seeding** | September 1 | October 20 | Wildflowers, live herbs |
| **Dormant seeding** | November 15 | freeze | Trees, shrubs, wildflowers, live herbs |
| **Winter** | freeze | March 15 | Trees, shrubs |

| **Nurse crop rates** (nurse crop NOT required but may be beneficial on sites prone to erosion**), only use light rates** (high rates will compete with and possibly smother desired plants) | | **Carriers: (mix with seed to broadcast or drill – use at least 3 times the amount of seed)** | |
|---|---|---|---|
| Oats, Annual Rye Grain, Buckwheat | Less than 20 lbs. per acre | sawdust | cracked corn |
| Brown-top millet | Less than 8 lbs. per acre | sand | pelletized lime |
| **Do not use:** winter wheat, winter rye, perennial rye, or introduced clovers | | soy hulls | cat litter (clay bentonite) |

April 2015

# Seeding Plan (fill in here or use Seed Calculator to create specifications)

**Name Prepared by** _____ **Date** _____
**Tract No.** _____
**Field No.** _____
**Type of Seeding:** _____ **Acres** _____ **Contract #** _____

## Seeding Mix Summary

| | Growth Form | Scientific Name | Common Name | Seeds/Ft$^2$ | Lbs PLS / Acre | Total lbs PLS |
|---|---|---|---|---|---|---|
| Grasses | Native grass (at least 1) | < 20% of mix for pollinator habitat | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | SUBTOTAL GRAMINOIDS | | | |

| | Growth Form/Flowering Period | Scientific Name | Common Name | Seeds/Ft$^2$ | Lbs PLS / Acre | Total lbs PLS |
|---|---|---|---|---|---|---|
| Minimum of 9 Flowers | Spring Blooming (at least 3) | | | | | |
| | | | | | | |
| | | | | | | |
| | Summer Blooming (at least 3) | | | | | |
| | | | | | | |
| | | | | | | |
| | Fall Blooming (at least 3) | | | | | |
| | | | | | | |
| | | | | | | |
| | Legume (can be in addition or included above) | | | | | |
| | Additional species | | | | | |
| | | | | | | |
| | | | SUBTOTAL FORBS | | | |
| | | | | | | |
| | | | TOTAL | | | |

| | Flowering Period | Scientific Name | Common Name | # Plants | Acre | Total |
|---|---|---|---|---|---|---|
| Other Forb, Subshrub, Shrub, or Vine Species | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Total | | |

**Additional Seeding Criteria:** **Do not apply fertilizer.**

**Frost Seeding dates: February 1 - March 15, Spring seeding dates: March 15 - June 1, Fall Seeding dates Sept. 1- Oct 20, Dormant Seeding dates: November 15 - freeze up.**

| | Date (s) Completed |
|---|---|
| **Type of site being converted:** Cropfield Pasture Old Field Logging Deck | |
| **Target species to eradicate:** | |
| **Site Prep to include:** Mowing Tilling Chemical Cover Crop Solarization Burning | |
| **Planting Method:** Hand Mechanically Broadcast No-Till Drill | |

**Site Prep & Seeding was completed by** _____ **according to the above requirements.**
(Date)

_____ _____
(Producer's Signature) (Date)

**Field Office** **Certified by:** _____
(NRCS Representative)

**When seeding is completed, return seeding plan to the Natural Resources Conservation Services.**