USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

South Carolina 327 (Conservation Cover) Jobsheet

Use this jobsheet to provide guidance for: the establishment of native plants for wildlife or pollinator habitat improvement, or restoration of natural communities using local ecotype plant materials.

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.

Local 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.

Local Ecotype Plant Materials: 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:

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.

Local Ecotype Plant Materials: Include at least 5 local ecotypes in plantings. Plant lists found in this document and in the SC Native Seed Calculator show which species with local origins may be available. Also see the vendor list for native and local ecotype plant availability.

Which Plant Species: Choose species from Tables 3 and 4 and those listed in the SC Native Seed Calculator. The Seed Calculator found in the EFOTG under Section 4, Practice 327, will assist with species mix selection and amount of seed needed. Many vendors will create a custom mix or may have native wildlife or pollinator seed mixtures available. Never plant introduced clovers with natives since they germinate early and shade out native seedlings.

Amount: The recommended seed planting rate to improve wildlife habitat or for natural community restoration (local ecotype) is **at least 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 sell it on a PLS basis. If the seed is sold on a "bulk" basis, vendors will usually provide % germination, % purity, % dormant and % hard seed on request, which will enable you to calculate PLS by using the following formula (viability = germination + dormant seed + hard seed): PLS = (% purity x % viability)/100

The purity multiplied by the viability, divided by 100 = the % of PLS in a lot of bulk seed. To determine how much bulk seed is needed to equal 1 PLS lb, 1 is then divided by the PLS.

Example: 96% purity x 80% viability, divided by 100 = 76.8% PLS in 1 bulk lb; 1 divided by .768 = 1.3. Therefore, 1.3 bulk lb is equal to 1 PLS lb.

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 (see formula above, 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 crops 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 partridge pea, Illinois bundleflower, Indian blanket, lemon mint, and showy tickseed sunflower can be included as one of the minimum number of species required, while nurse crop species such as oats, rye grain, buckwheat, and 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**.** ***Please follow the 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. 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. *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. *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). *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. *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.

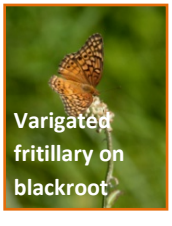
References:

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


Slender lespedeza and goldenrod


Varigated fritillary on blackroot


Little bluestem


Bee on Echinacea


Indian grass

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.


Insects on milkweed

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, rice hulls, cracked corn, etc. in order to facilitate good seed coverage. About a truck bed full of carrier per acre 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. Expect a weed problem in the first year. Avoid the temptation to pull the weeds, because the wildflower seedlings may be dislodged.

- 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 such as johnsongrass and Nodding Thistle.

SECOND YEAR: Mow once, close to the ground, 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. If you mow too late in the fall, you 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.

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 on 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.

Table 2. Native Wildflowers to plant or promote for the benefit of wildlife and pollinators and for natural plant community restoration. The SC Native Seed Calculator can be found in the EFOTG under Section 4, Practice 327.							
Common Name	*Scientific Name / Alternate names*	**Soil Moisture, Light Requirements**	**Bloom Color**	**Bloom Season**	**Annual or Perennial**	**Region Best Suited**	**Seeds / lb.**
Indian Blanket	*Gaillardia pulchella*	low to moderate, full sun	red	spr-fall	A	P,CP	223,300
Ox Eye Sunflower	*Heliopsis helianthoides*	low to moderate, full sun	yellow	spr-fall	P	All	154,000
White Wild Indigo (legume)	*Baptisia alba*	moderate, full sun	white	spring	P	All	30,000
Spiked Wild Indigo (legume)	*Baptisia albescens*	low, sun to part shade	white	spring	P	All	25,000
Blue Wild Indigo (legume)	*Baptisia australis*	moderate, full sun	purple, blue	spring	P	M, P	26,000
Catbells (legume)	*Baptisia perfoliata*	low, full sun	yellow	spring	P	P, CP	25,000
Blue Flag Iris	*Iris virginica*	high, sun to shade	purple	spring	P	All	16,000
Wild Blue Lupine (legume)	*Lupinus perennis*	low, full sun	blue	spring	P	P,CP	16,000
Pickerelweed	*Pontederia cordata*	high, full sun	purple	spring	P	All	5,000
Greyheaded Coneflower	*Ratibida pinnata*	moderate, full sun	yellow	spring	P	P	672,000
Narrowleaved Blue-eyed Grass	*Sisyrinchium angustifolium*	moderate, sun to part shade	blue	spring	P	All	720,000
Wreath Goldenrod	*Solidago caesia*	moderate, sun to part shade	yellow	spring	P	All	2,200,000
Virginia Spiderwort	*Tradescantia virginiana*	moderate, part shade	purple	spring	P	All	145,000
Largeflower Tickseed	*Coreopsis grandiflora*	low, full sun	yellow	spr-sum	P	All	160,000
Lance Leaved Coreopsis	*Coreopsis lanceolata*	low, full sun or light shade	yellow	spr-sum	P	All	221,000
Showy Primrose	*Oenothera speciosa*	low, full sun	yellow	spr-sum	P	All	1,000,000
Appalachian Beard Tongue	*Penstemon laevigatus*	high, full sun	purple	spr-sum	P	All	<2,800,000
Annual Phlox	*Phlox drummondii*	low, sun to part shade	pink, red	spr-sum	A	P, CP	241,500
Black-Eyed Susan	*Rudbeckia hirta*	low to moderate, full sun	yellow	spr-sum	P	All	1,700,000
Goat's Rue (legume)	*Tephrosia virginiana*	low, sun to shade	pink, yellow	spr-sum	P	All	120,000
Ohio Spiderwort/Bluejacket	*Tradescantia ohiensis*	low, part shade	purple	spr-sum	P	P, CP	145000
Zigzag Spiderwort	*Tradescantia subaspera*	low, part shade	blue	spr-sum	P	M, P	145,000
Golden Alexanders	*Zizia aurea*	moderate, full sun to part shade	yellow	spr-sum	P	All	185,000
legumes highlighed in blue		**Regions: M=Mountains, P=Peidmont, CP=Coastal Plain, All=Statewide**					

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Common Name	*Scientific Name / Alternate names*	**Soil Moisture, Light Requirements**	**Bloom Color**	**Bloom Season**	**Annual or Perennial**	**Region Best Suited**	**Seeds / lb.**
Common Milkweed	*Asclepias syriaca*	moderate, full sun	pink	summer	P	M, P	70,000
Butterfly Milkweed	*Asclepias tuberosa*	low, full sun	orange	summer	P	All	70,000
Horsefly Weed (legume)	*Baptisia tinctoria*	low, full sun	yellow	summer	P	All	25,000
Illinois Bundleflower (legume)	*Desmanthus illinoensis*	moderate, full sun	white, yellow	summer	P	All	200,000
Panicle-leaf Trefoil (legume)	*Desmodium paniculatum*	low, sun to part shade	purple	summer	P	All	78,400
Rattlesnake Master	*Eryngium yuccifolium*	low to moderate, sun to part shade	white	summer	P	All	124,000
Woodland Sunflower	*Helianthus divaricatus*	low, sun to shade	yellow	summer	P	All	170,000
Crimson-eyed Rose Mallow	*Hibiscus moscheutos*	high, full sun	white	summer	P	All	45,000
Grass-leaf Blazing Star	*Liatris graminifolia / L. pilosa*	low, full sun	purple	summer	P	All	173,000
Scaly Blazing Star	*Liatris squarossa*	low, full sun	purple	summer	P	All	173,000
Lemon Mint	*Monarda citriodora*	partial shade	purple	summer	A	P, CP	1,440,000
Wild Bergamot	*Monarda fistulosa*	high, part sun	pink	summer	P	M, P	1,250,000
Spotted Bee Balm	*Monarda punctata*	low, full sun	purple	summer	A	All	1,472,000
Wild Quinine	*Parthenium integrifolium*	low, full sun	white	summer	P	M, P	112,000
Clustered Mountain Mint	*Pyncnanthemum muticum*	moderate, sun to part shade	white	summer	P	All	3,500,000
Wild Senna/American Senna (legume)	*Senna hebecarpa or marilandica / Cassia marilandica*	low to high, full sun to light shade	yellow	summer	P	All	22,400
Cup Plant	*Silphium perfoliatum*	moderate, sun to part shade	yellow	summer	P	P	22,400
Pinebarren Goldenrod	*Solidago fistulosa*	moderate, full sun	yellow	summer	P	CP	700,000
Gray Goldenrod	*Solidago nemoralis*	moderate, full sun	yellow	summer	P	All	1,000,000
Smooth Blue Aster	*Aster laevis / Symphyotrichum laeve*	moderate, part sun	blue	sum-fall	P	All	832,000
New England Aster	*Aster novae-angliae / Symphyotrichum novae-angliae*	moderate, part shade	purple	sum-fall	P	M	1,088,000
Eastern Showy Aster	*Aster spectabilis / Eurybia spectabilis*	low, full sun	purple	sum-fall	P	P	1,200,000
Showy Tickseed Sunflower/Bur-marigold	*Bidens aristosa*	moderate to high, full sun or partial shade	yellow	sum-fall	A	All	25,000
Partridge Pea (legume)	*Chamaecrista fasciculata / Cassia fasciculata*	low, full sun or light shade	yellow	sum-fall	A	All	65,000
legumes highlighed in blue		**Regions: M=Mountains, P=Peidmont, CP=Coastal Plain, All=Statewide**					

Table 2. Native Wildflowers to plant or promote for the benefit of wildlife and pollinators and for natural plant community restoration. The SC Native Seed Calculator can be found in the EFOTG under Section 4, Practice 327.							
Common Name	*Scientific Name / Alternate names*	**Soil Moisture, Light Requirements**	**Bloom Color**	**Bloom Season**	**Annual or Perennial**	**Region Best Suited**	**Seeds / lb.**
Tall Coreopsis	*Coreopsis tripteris*	moderate, part shade	yellow	sum-fall	P	P	224,000
Blue Mistflower	*Conoclinium coelestinum*	moderate, sun to part shade	blue, purple	sum-fall	P	All	1,600,000
Joe Pye Weed	*Eupatorium fistulosum*	moderate, part shade	pink	sum-fall	P	All	1,600,000
Swamp/Narrow-Leaf Sunflower	*Helianthus angustifolius*	moderate, full sun or partial shade	yellow	sum-fall	P	All	504,000
Thin-Leaf Sunflower	*Helianthus decapetalus*	High, sun to shade	yellow	sum-fall	P	M, P	170,000
Marsh Blazing Star	*Liatris spicata*	moderate, part shade to sun	pink, purple	sum-fall	P	M, P	135,000
Cardinal Flower	*Lobelia cardinalis*	High, part sun to shade	red	sum-fall	P	All	8,000,000
Downy Lobelia	*Lobelia puberula*	High, part sun to shade	blue	sum-fall	P	All	8,000,000
Evening Primrose	*Oenothera biennis*	low to moderate, full sun to light shade	yellow	sum-fall	P	All	1,300,000
Orange Coneflower	*Rudbeckia fulgida*	moderate, full sun	yellow	sum-fall	P	All	1,472,000
Starry Rosinweed	*Silphium asteriscus*	moderate, full sun	yellow	sum-fall	P	All	<480,000
Rigid Goldenrod	*Solidago rigida or Oligoneuron rigidum*	moderate, sun to part shade	yellow	sum-fall	P	M, P	720,000
Wrinkle-Leaved Goldenrod	*Solidago rugosa*	moderate, sun to part shade	yellow	sum-fall	P	All	2,200,000
Showy Goldenrod	*Solidago speciosa*	high, part shade	yellow	sum-fall	P	All	1,600,000
Yellow Wingstem	*Verbesina alternifolia*	high, full sun	yellow	sum-fall	P	All	144,000
Giant Ironweed	*Vernonia gigantea or altissima*	moderate, sun to shade	purple	sum-fall	P	P, CP	300,000
New York Ironweed	*Vernonia noveboracensis*	moderate, sun to shade	purple	sum-fall	P	All	360,000
Eastern Swamp Milkweed	*Asclepias incarnata*	high, full sun	pink	fall	P	All	76,800
New York Aster	*Aster novi-belgii /*	moderate, sun to part shade	blue	fall	P	P, CP	1,500,000
Purple Stemmed Aster	*Aster puniceus / Symphyotrichum*	high, full sun	purple	fall	P	M, P	1,500,000
Boneset	*Eupatorium perfoliatum*	moderate to high, full sun or partial shade	white	fall	P	All	1,600,000
Sneezeweed	*Helenium autumnale*	moderate, full sun	yellow	fall	P	All	2,080,000
Elegant Blazing Star	*Liatris elegans*	low, full sun	pink	fall	P	P, CP	140,000
Canada Goldenrod	*Solidago canadensis*	moderate, full sun	yellow	fall	P	All	2,200,000
Rough-Leaved Goldenrod	*Solidago patula*	high, sun to part shade	yellow	fall	P	All	704,000
legumes highlighed in blue		**Regions: M=Mountains, P=Peidmont, CP=Coastal Plain, All=Statewide**					

Table 3: Native Grass Species to plant or promote for the benefit of wildlife, pollinators, and to restore natural plant communities. Warm-season grasses should not be planted with introduced clover species (clovers will shade out young grass seedlings).

Common Name (grasses)	Scientific Name	Seeds / lb.	Soil moisture needs	Light needs	Growing Season
Big Bluestem	*Andropogon gerardii*	165,000	moist to dry	full sun	warm
Bushy Bluestem	*Andropogon glomeratus*	205,000	moist to wet	full sun	warm
Splitbeard Bluestem	*Andropogon ternarius*	200,000	dry	sun to part shade	warm
Wiregrass (can plant plugs)	*Aristida stricta or beyrichiana*	500,000	dry	sun to part shade	warm
River Oats/Indian Wood Oats	*Chasmanthium latifolium*	90,000	moist	sun to shade	cool
Toothache Grass	*Ctenium aromaticum*	283944	moist to wet	part shade	warm
Canada Wild Rye	*Elymus canadensis*	83,200	moist to dry	sun to shade	cool
Bottlebrush Wild Rye	*Elymus histrix*	121,600	wet to moist	shade	cool
Riverbank Wild Rye	*Elymus riparius*	125,000	wet to moist	sun to shade	cool
Virginia Wild Rye	*Elymus virginicus*	100,000	moist	sun to shade	cool
Fowl Manna Grass	*Glyceria striata*	1,400,000	moist	sun to shade	cool
Muhly Grass/Sweetgrass	*Muhlenbergia capillaris*	1,400,000	moist to wet	full sun	warm
Beaked or Fall Panicum	*Panicum anceps*	560,000	moist to wet	part shade	warm
Deer Tongue Rosette Grass	*Panicum clandestinum (Dichanthelium clandestinum)*	400,000	dry	sun to shade	warm
Switchgrass (aggressive, no more than 1 lb. PLS/ac)	*Panicum virgatum*	390,000	moist to dry	full sun	warm
Little Bluestem	*Schizachyrium scoparium (Andropogon scoparius)*	260,000	dry to moist	full sun	warm
Nodding Indiangrass	*Sorghastrum elliotii*	170,000	dry	sun to part shade	warm
Indian grass	*Sorghastrum nutans*	175,000	dry to wet	full sun	warm
Lopsided Indian Grass	*Sorghastrum secundum*	250,000	dry	full sun	warm
Pineywoods Dropseed	*Sporobolus junceus*	1,134,000	dry	part shade	warm
Purple Top	*Tridens flavus*	460,000	dry	full sun	warm
Eastern Gama Grass (plant 1 in. deep, can use a corn planter)	*Tripsacum dactyloides*	6,000	moist to wet	full sun	warm

Wiregrass

Rattlesnake master, butterfly milkweed, and Eastern Gama grass

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

Pollinators

Common Name	Common Name	Common Name	Common Name	Common Name
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
Grounsel	*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				
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
Local Ecotype Plant Materials	Minimum 5 species of local origin	30 or more seeds per sq. ft.	Project dependant

*"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 dependant
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 dependant
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

NOTES:

January 2015

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

Name _____ **Date** _____
Prepared by _____ **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.