

Prepared for: _____

Prepared by: _____

Farm: _____ Tract: _____ Date: _____

DEFINITION: A strip of permanent native vegetation established at the edge or around the perimeter of a field.

PURPOSES:

- Enhance/establish habitat for wildlife and pollinators, including beneficial insects using native plant species
- Reduce soil erosion from wind and water
- Improve water and soil quality

WHERE USED: This practice applies on all lands needing permanent vegetative cover for the benefit of wildlife and pollinators. This practice does not apply to plantings for forage production or to typical critical area planting. If chemical drift is an issue, plan only non-flowering species establishment (native grasses/evergreen shrubs).

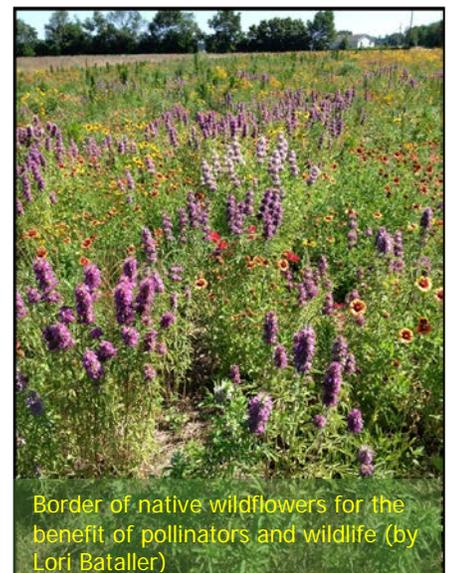
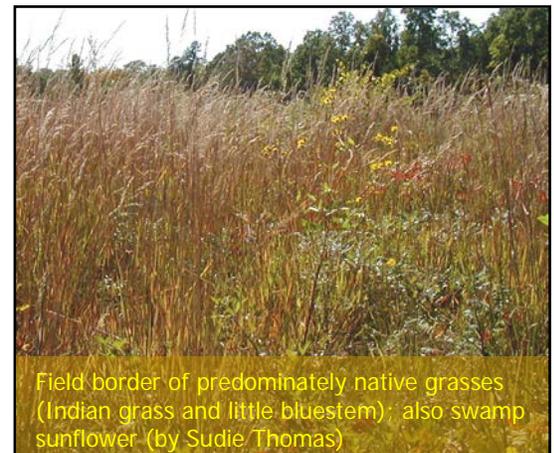
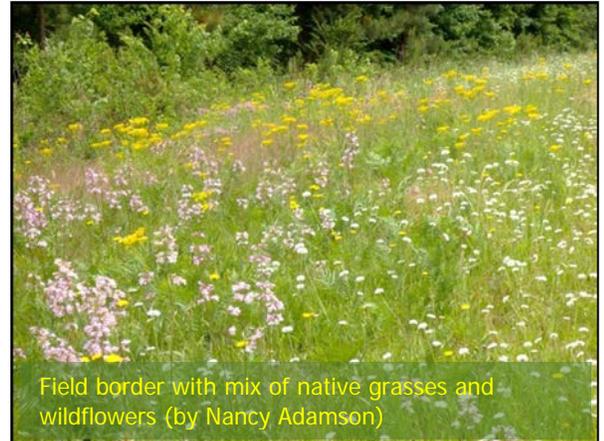
OPERATIONS:

Pre-planting: Scout the areas at least one year prior to the planned seeding date. Identify all of the vegetation that will compete with desired planted native species. It is critical to the success of the seeding that the competition from other plants (especially bahia, bermuda, fescue, sericea, Johnson grass, Texas Panicum, and crabgrass) be removed prior to seeding. If areas of beneficial natives exist, protect those areas and establish new plants nearby.

Control competition: If chemical treatment is needed for problematic exotic and/or invasive plants, follow the recommendation of the Clemson Weed Guide or Clemson Extension for the correct herbicide treatment (guidance can also be found in the publication: A Management Guide for Invasive Plants in Southern Forests by James H. Miller, Steven T. Manning, and Stephen F. Enloe: <http://www.srs.fs.usda.gov/pubs/36915>). It can often be necessary to apply a chemical treatment in the fall before seeding in the spring, and/or to apply multiple treatments in the spring and summer before seeding in the fall or the following spring. Delay seeding for the recommended time necessary for selected herbicide (some herbicides persist).

Other Considerations:

- Soil PH should be above 5.5 (6.5 is best). Get a soil test to determine whether or not to add lime.
- Nitrogen is not recommended at planting since it will encourage undesirable plant competition. Nitrogen can be applied after seedling emergence (mid-year) at 30-50 lbs/acre.
- Phosphate and Potash can be added at planting if needed. Native warm-season grasses do well on soils testing 20 to 35 pounds of Phosphorus per acre.
- Make sure all planting equipment is cleaned prior to use on site to prevent seeds, rhizomes or other material from invasive exotic plants from being brought to the site.



REQUIREMENTS

Size: Minimum of 30 feet wide. Wider field borders provide more resources and reduce chances of nest predation. Maintain at least the original width and length of field or field border(s). Increasing the width is beneficial.

Species Selection: Species planted must be of native southeastern origin. Local ecotype plant materials are preferred. Seeds or live plants may be established. Several seed vendors and nurseries have highly diverse inventories and can create/provide mixtures tailored to the project needs. Lists of approved species and known vendors should be provided to client. 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>). *Ask NRCS Biologist for assistance with planting plan if needed.*

Plant Materials (*keep and submit seed tags, vendor species lists, and/or invoices for documentation*):

- **Seed (wildflowers/grass):** Most native seed vendors sell on a PLS (Pure Live Seed) basis (ask for PLS).
 - **For Wildlife:** 3 or more species of native grasses and/or wildflowers (including legumes) at a rate of **25-30 PLS seeds per square foot.** Wildlife, especially songbirds and game species will benefit from a diverse mixture of native grasses and wildflowers.
 - **For Pollinators:** 10 or more species: minimum of 9 native wildflowers and at least 1 species of native grass (grasses must not exceed 20% of seed mix - by # of seeds) at a rate of **40–60 PLS per square foot.** Provide a species mixture that will cover the growing season (at least 3 blooming per season: Spring, summer, and fall = at least 9 wildflowers/forbs). If practice is planned adjacent to a crop that requires pesticide (insecticides and fungicides), care should be taken to ensure that the practice is not designed to attract pollinators when pesticides are being applied. Pollinator plants included should not be flowering when pesticides toxic to pollinators are applied to the adjacent crop (for example, plan to establish 4-5 + species that bloom in the spring and 4-5 + blooming in fall if pesticide will be applied during summer).
- **Herbaceous wildflower plants:** Live plants (e.g. plugs, sprigs, tublings, bareroot, or containerized material) can be used alone or with seeds. Use spacing of 18"- 24" for plugs or up to 36" - 48" for larger plants/pots (3 inch or greater). Cluster or plant in rows. If clumping, plant seedlings in groups of 10 to 20, 2-5 feet apart. Clumps can be situated about 25 feet apart with a goal of 1,000 to 2,000 small plugs or 500 to 1,000 larger potted plants per acre. This type of planting may require irrigation.
- **Flowering woody trees, shrubs, and vines** can be included as nectar sources and to provide structure. These can be included as part of the 9 flowering species. Plant trees about 12 to 20 feet apart (depending on size at maturity), shrubs 6 to 12 feet apart in rows or clumps near herbaceous plantings. Tree shelters/ browse protection will aid in establishment.

When to Plant: 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). Seed mixtures of primarily native grasses may germinate more successfully when planted during late winter or early spring. Live plants should be planted during fall or winter.

Seeding:

Seed Bed Preparation:

- Good seed to soil contact is extremely important.
- 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, mowed and raked, or incorporated into the soil to ensure good seed to soil contact. However, tillage may be needed to smooth out crop ridges. If conventional tillage is required, the soil should be culti-packed or rolled prior to seeding.

Planting Seed:

- Broadcast seeding is recommended for small plots and diverse seed mixtures (small seeds may not move well through seed drills).
- Never plant seeds deeper than ¼ inch (if soil is too fluffy, seed can be buried too deeply and will not germinate). A firm seed bed is essential.
- Very light rates of annuals can be planted with target plant materials to stabilize the soil, reduce weed growth, and to give an early indication of establishment success if desired. Nurse crop species such as oats, annual rye grain, buckwheat (<20 lbs/ac), and browntop millet (<8 lbs/ac) 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.
- If using a native seed drill, mix seed with a carrier such as pelletized lime or cat litter (clay bentonite) so that small seed are spread evenly. Adding a low rate of an annual nurse crop seed with a carrier can help as well.

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 (for firm, not fluffy seed bed) and then again after seeding to press the seed into the soil.
 - Mix seed with a carrier such as pelletized lime, cat litter (clay bentonite), sawdust, sand, soy hulls, or cracked corn in order to facilitate good seed coverage. Use at least 3 times as much carrier as seed. The more the seed is diluted, the better it will be distributed.
 - Divide the seed/carrier mixture in half. Broadcast half the mixture in one direction over the area, then broadcast the other half at a right angle to the first pass to insure equal coverage.
 - 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).
- If necessary (for sloped areas > 6% with high erosion potential), mulch newly seeded area with 1,000 lbs. per acre of mulch material. Straw mulch shall consist of wheat, barley, oat or rye grain straw, hay, or grass cut from native grasses. Mulch must not contain noxious or invasive weeds.

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. Establishment may take 1–3 years.

- During the 1st and 2nd years of establishment, competing exotic plants such as crabgrass, bahia, bermuda, Johnson grass and even some natives like dog fennel and horseweed will compete. If this occurs, mow only the areas with competing vegetation. When plants grow over 12", mow them down to 8" in order to allow more sunlight for desired perennials and to sever weed seed heads before they mature. Mow several times as needed over the growing season if competition continues to be a problem. Mowing once plants are much taller than 12" may smother seedlings (may remove mowed thatch if this occurs).
- Maintenance activities should not disturb cover during the primary nesting/active pollinator season from April 1 – September 1 (later into fall for pollinators), annually. Exceptions should be considered for periodic burning or mowing when necessary to maintain the health of the desired plant community and to control harmful pest plant competition.
- Preferably, mowing should be limited to times when plants have died back or are dormant. Mowing at any time (even in the winter) kills insects. In the summer, some insects can't get away from the mower, especially eggs and caterpillars. In the winter insects may be dormant in leaf litter or plant stems. Mowing in patches ensures that pollinators can recolonize the mowed areas.
- Avoid insecticides. Pesticide and herbicide use on or near a habitat plot can have significant negative effects on pollinator populations. Pollinator habitat should have been installed where chemical drift is not an issue. Alternative means of addressing pest issues (mowing, haying, burning, etc.) should be used.
- If needed, minimal, well-timed herbicide applications can be applied. If chemicals must be used, choose the least toxic alternative, and apply them early and late in the day when fewer monarchs/pollinators are present. Please note that chemicals, especially insecticides, can kill butterfly and moth larvae, if they are present. Herbicides, if required, should be applied with targeted spot treatments instead of a broadcast method. Whenever possible, mechanical removal of shrubs should be used in combination with herbicides to maintain butterfly habitat.
- Control exotic invasive plant species by targeted herbicide or mechanical means.

- Consider adding a sign marking the wildlife or pollinator habitat plots to be sure farm workers or land managers do not accidentally mow, plow, or treat the plots with pesticides.
- Established stands can be maintained by burning in alternating patches. It is important to note that some pollinator and beneficial insect 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 burned 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.
- Inspect after major storms, remove trapped sediment, repair eroding areas and reseed any areas where cover has been destroyed during the next appropriate seeding period.

Summaries:

Minimum requirements for Field Border (386 Practice)		
Species	Planting Rate (seeds)	Size
Wildlife Habitat: Minimum 3 species or more native grasses and/or wildflowers/forbs	25-30 seeds per square foot <i>(high end of range more beneficial if seed broadcast)</i>	30 foot minimum width
Pollinator Habitat: Minimum 10 species: 9 or more forbs covering 3 seasons + 1 grass (<20% of mix by number of seed or plants)	40-60 seeds per square foot <i>(high end of range more beneficial if seed broadcast)</i>	30 foot minimum width

Plant material requirements and spacing (for live plants- plugs, potted, bareroot, etc.)	
Plant form	Wildlife or Pollinator Field Border Habitat
Trees	12 x 12 feet to 20 x 20 feet based on tree size at maturity
Shrubs	6 x 6 feet to 12 x 12 feet based on shrub size at maturity
Herbs: plugs (wildflowers and grasses), tublings, sprigs, bareroot or potted	Use spacing of 18"- 24"for plugs or up to 36"- 48" for larger plants/pots (>3 inch). Cluster or plant in rows. If clumping, plant seedlings in groups of 10 to 20, 2-5 feet apart. Clumps can be situated about 25 feet apart with a goal of 1,000 to 2,000 small plugs or 500 to 1,000 larger potted plants per acre.

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 <u>Grain</u> , 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)

Planting Dates			
Time	From	To	Recommended for
Frost	February 1	March 15	Native grasses, wildflowers
Spring: Spring planting should occur prior to last frost (coastal plain- April 1, piedmont- April 15)	March 15	June 1	Native grasses
Fall: Fall planting should be finished at least 6 weeks before hard-freezing weather occurs (coastal plain- Oct. 20, piedmont- Oct. 10)	September 1	October 20	Wildflowers, live herbs (plugs, pots, etc.)
Dormant: [it is important to wait until the soil temperature has cooled to less than 55 degrees Fahrenheit (Nov.- mid Feb.)]	November 15	freeze	Trees, shrubs, wildflowers, live herbs (plugs, pots, etc.)
Winter	freeze	March 15	Trees, shrubs

