

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

HEDGEROW PLANTING

(Ft.)

CODE 422

DEFINITION

Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.

PURPOSE

Providing at least one of the following conservation functions:

- Food, cover and corridors for terrestrial wildlife.
- Food and cover for aquatic organisms that live in watercourses with bank-full width less than 5 feet.
- To intercept airborne particulate matter.
- To reduce chemical drift and odor movement.
- To increase carbon storage in biomass and soils.
- Living fences
- Boundary delineation
- Contour guidelines
- Screens and barriers to noise and dust
- Improvement of landscape appearance

CONDITIONS WHERE PRACTICE APPLIES:

This practice applies wherever it will accomplish at least one of the purposes stated above.

CRITERIA

Applicable to All Purposes

The minimum width of this practice is 5 feet.

The maximum width of this practice is 30 feet.

Plants selected must be suited and adapted to the soils, climate, conservation purpose, and appear in Appendix 1 of this standard.

Specifications for plantings not appearing in Appendix 1 of this standard shall be developed in consultation with a specialist with expertise in horticulture, landscape architecture, wildlife, or forestry and approved by an NRCS Area Resource Conservationist, Area Biologist, the State Biologist, or State Plant Materials Specialist.

Soil samples shall be collected from the site and tested; and soil site conditions shall be corrected to meet the tolerance of selected plantings prior to, or concurrent with establishment.

All planned work shall comply with any applicable federal, state or local laws or regulation.

Applicable to Specific Purposes:

Developing Wildlife Food, Cover and Corridors

Establish at least two species of vegetation that provide cover and/or food to support the landowner's wildlife objectives.

Minimum hedgerow width, at maturity, shall be 15 feet. This may necessitate the establishment of more than one row of plants.

Developing Habitat in Small Watercourses

Selected plants need to be provide cover and/or food to support the landowner's wildlife objectives.

Plantings shall be site-adapted, grow large enough at maturity and be installed close enough to shade the watercourse.

Establishing Living Fences

Selected plants shall attain a size adequate to

create a barrier to exclude livestock or humans, as needed.

If the purpose is to contain livestock, selected plants shall not be poisonous or palatable to the animals.

Delineating Boundaries

Hedgerows shall be aligned along boundaries to differentiate land management units.

Establishing Contour Guidelines

Hedgerows shall be aligned so they provide permanent contour markers supporting implementation of Contour Farming (330) or Stripcropping (585). Refer to those conservation practice standards for alignment criteria.

Establishing Screens and Noise Barriers

Locate hedgerow to most completely obstruct the line of sight to offensive object or sound.

Incorporate evergreen plants that attain a height and fullness sufficient to break the line of sight or baffle sound.

Improving of Landscape Appearance

The hedgerow design shall meet the aesthetic objectives of the landowner.

Plants shall be selected based upon the landowner's preferences for color, texture and growth habit.

Reducing Particulate Matter Movement

Install the hedgerow as close to perpendicular to the prevailing wind direction as possible.

Incorporate evergreens and/or tall bunch grasses of sufficient height and density to intercept the particulates.

Reducing Odor Movement and/or Chemical Drift

Orient the hedgerow as close to perpendicular to the prevailing wind direction and between the source of the odor or chemical drift and the sensitive areas.

Locate hedgerow upwind of the odor producing area or the chemical application area.

Incorporate evergreens that are large enough at maturity to intercept airborne chemicals or odors.

Applicable to Establishing Bunch Grasses

Weed control shall be sufficient for ensuring establishment and growth of selected plantings.

Plant grasses from seed at the rates indicated in Appendix I, or install container grown plants on 18-inch centers.

Grass seedling survival may be determined during the first growing season by identifying the planted species growing in drill rows, or by inflorescence or seed heads during the late summer or fall of the first growing season. The planting is successful when average density of viable grass clumps is at least 1 per square foot during the second growing season.

Container grown seedling survival should be at least 90% during the second growing season.

Replacement plantings should be made within 2-years of the initial planting.

Applicable to Establishing Woody Plants

Plants shall be spaced at least 5 feet apart.

There is no requirement for spacing plants in order to form a continuous band of woody vegetation, although such a specification is acceptable.

Weed control shall be sufficient for ensuring establishment and growth of selected plantings.

Unwanted vegetation competing for sunlight with the desirable planting shall be done using the best-suited method described in NRCS Forest Stand Improvement (Code 666) practice during the seedlings' first growing season to assure better survival and faster initial growth.

Planting stock shall be vigorous and of good quality. Inferior quality planting stock shall not be used for this practice.

Planting stock shall be handled transported and stored in manners that protect the stock's quality and health. Improperly stored seedlings shall not be used for this practice.

Bare root stock shall be planted during the seedlings dormant season.

Container grown and field dug stock shall be planted during autumn, or winter.

Where adequate artificial irrigation is assured, container-grown and field dug stock may also be planted during spring.

Tree and shrub planting holes must be of sufficient width and depth to accommodate a plant's entire root system in its natural position in the soil.

Plant roots shall not be twisted, balled, J or U-shaped. No roots shall be left exposed at the surface. Root placement is tested by visual inspection, at the surface and opening a hole on one side of the plant to expose the seedling in place.

Planting slits, furrows and holes shall be kept free of plant stems, leaves and other dry litter.

Bare root seedlings shall be planted 1-2 inches deeper than they grew in the nursery in all soils, except deep sands where they shall be planted 2 to 4 inches deeper than they grew in the nursery.

Container grown and field dug stock shall be planted at the same depth or 1-2 higher than it was grown in the nursery.

Soil shall be packed firmly around the plantings with no air pockets around roots. Soil firmness is tested by grasping plant tips and lifting upward. If the plant wiggles in the planting hole, or comes easily out of the ground, the seedling has not been adequately packed.

Tree and shrub survival rates may be determined during the growing season by evaluating plants in randomly selected 1/100 acre plots. The radius of a 1/100 acre plot is 11.75'. Sufficient plots are needed to give a good representation of area.

If 75% of the established seedlings survive per acre, at the end of the first growing season after planting, then it is not necessary to replant. Replanting shall be required when survival is inadequate. Replacement plantings must be made within 2 years after the original planting.

Applicable to Establishment of Volunteer Vegetation

This low-cost method of hedgerow establishment should only be specified when the client is advised of and accepts the following risks:

- The composition and structure of vegetation in the hedgerow is impossible to predict. However, the vegetation is likely to include several woody plant species favored as food by wild birds inhabiting the vicinity.

- Birds may introduce locally common non-native plants into the hedgerow such as Autumn olive, Japanese honeysuckle, Porcelain vine, Oriental bittersweet, Chinese privet, and Multiflora rose. Although these plants do provide a source of wildlife food, they are difficult to contain and replace native habitat resources, so careful scouting and control of any is recommended.

Weed control shall be sufficient for ensuring establishment and growth of selected plantings.

Volunteer vegetation can be recruited at a desired hedgerow location by temporarily suspending a single strand of light gauge wire, or fence, 4 to 6 feet above a thoroughly disked seedbed that is four to six feet wide. Following installation, song birds will perch on the wire and scatter seeds on the seedbed when they feed and defecate.

The wire and support posts may be removed once vegetation suited to the practice purpose has become established.

CONSIDERATIONS

All Purposes

Combining this practice with other compatible practices such as Field Border (Code 386), Early Succession Habitat Development & Management (Code 644), Riparian Forest Buffer (Code 391), and Tree/Shrub Establishment (Code 612) can enhance landscape aesthetics, reduce soil erosion, improve sediment trapping, improve water quality and reduce habitat "edge effects".

Planting a hedgerow larger than the minimum length and width will increase the amount of carbon stored in the soil and plant tissue.

Hedgerows following land contours create meandering lines on the landscape, produce a natural appearance and increase the availability of "edge" wildlife habitats.

Hedgerows containing a mixture of native shrubs and small trees provide the greatest combination of environmental benefits.

Use of larger planting stock will accelerate hedgerow development.

At maturity, shade produced by the hedgerow may impact growth of adjacent plants, microclimate and aesthetics.

Limiting renovation events to one-third of a hedgerow's length or width will prevent sudden elimination of the practice's wildlife habitat function.

Periodic root pruning can reduce nutrient and water robbing from adjacent cropland.

Plants that spread by root suckers, or rhizomes are most likely to expand beyond the desired treatment area.

Wildlife Food, Cover and Corridors

Hedgerows can provide travel lanes, or corridors that allow wildlife to move safely across a landscape.

Generally, wider corridors accommodate more wildlife use.

Linking fragmented habitats may increase wildlife use of an area.

In grassland ecosystems, hedgerows may adversely affect area-sensitive nesting birds by fragmenting habitat patches and increasing the risk of predation.

Hedgerows can complement the availability of naturally occurring wildlife foods.

Hedgerows can provide wildlife with cover for feeding, loafing, nesting and caring for young.

Dense or thorny shrub thickets provide songbirds with important nesting sites and a refuge to escape predators.

Establishment of evergreen plants provides year-round concealment and thermal cover for wildlife.

Establishment of herbaceous vegetation along the edges of a hedgerow can further enhance the habitat functions of a hedgerow.

Installation of artificial nest boxes with predator guards can encourage cavity-nesting birds and small mammals to utilize a hedgerow.

Living Fences

Thorny shrubs and trees can improve a living fence's barrier effect.

Screens and Noise Barriers

From eye-level, hedgerows reduce the line-of-sight across open areas, concealing objects behind them from view.

Consider the design from viewpoints on both sides of the screen.

Locate noise barriers as close to the source of noise as possible.

Combination of shrubs and/or trees can create more effective screens than single species plantings.

Evergreens provide foliage that can maintain a screen's year-round effectiveness.

Improving Landscape Appearance

Consider plants' seasonal display of colors on bark, twigs, foliage, flowers and fruit.

Consider plants' growth habits (outline, height and width).

Water Quality and Quantity

Water quality benefits may arise from:

- Arresting sediment movement and trapping sediment-attached substances.
- Infiltration and assimilation of plant nutrients.
- Water cooling effects resulting from increased shade on small watercourses.

A hedgerow will increase surface water infiltration by improving soil structure around its root zone. However, evapotranspiration may reduce groundwater recharge benefits.

Incidental Trapping of Snow or Sand

Although not a primary purpose, hedgerows may incidentally trap wind blown snow or sand.

Consider installing hedgerows on alignments that prevent trapping and accumulation of snow and sand on public roads.

Refer to the Windbreak/Shelterbelt Establishment (380) standard for criteria when snow or sand trapping is a primary conservation purpose.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site.

Plans and specifications shall include written instructions for proper establishment, as well as operation and maintenance required for successful implementation of the practice over a minimum span of 10-years.

Plans and specifications shall be recorded using approved specification sheets, job sheets, or narrative documentation in the conservation plan, or other acceptable

documentation.

OPERATION AND MAINTENANCE

Release and Cultural Practices

All plantings shall be released from overtopping vegetation during the first year after planting.

Competing vegetation shall be controlled until the desired plants are established.

Damaging pests and disease shall be monitored and controlled.

Periodic application of fertilizer may be needed to maintain plant vigor.

Any plant officially listed by the state as a noxious weed shall be controlled in a hedgerow.

Protection of Plantings

Properly managed grazing may be an appropriate activity in Hedgerows, provided that

the purpose of the planting is not permanently compromised by foraging livestock. For further details, consult the NRCS practice Fence, (Code 382).

Prescribed burning may be an appropriate management practice for stiff stemmed grass hedges. For further information, refer to the NRCS practice Prescribed Burning (Code 338) and Firebreak (Code 394).

Schedule pruning, prescribed burning and other hedgerow renovation activities during September - March.

REFERENCES

National Biology Handbook, Part 614.4, "Conservation Corridor Planning at the Landscape Level". Natural Resources Conservation Service, August 1999.

Suitable Hedgerow Plants

Tall, Stiff-Stemmed Grasses	Planting Rate (lbs/ac)		Depth to Plant (inches)	Recommended Planting Dates ¹ (by Major Land Resource Area) ²		
	Broadcast	Drill	Depth to Plant (inches)	130 (Mountains)	136 (Piedmont)	137, 133A, 153A, 153B (Coastal Plain)
Bluestem, Big	10-12 PLS ³	8-10 PLS ³	¼ - ¾	03/15-06/15	02/15-06/1	02/10-05/31
Coastal panicgrass	10-12 PLS ³	6-10 PLS ³	¼ - ¾			
Eastern gamagrass For well drained - somewhat poorly drained sites: 'Pete', 'Iuka'	---	8-10 PLS ³	¾ - 1	03/15-06/15	02/15-06/1	02/10-05/31
Indiangrass	10-12 PLS ³	8-10 PLS ³	¼ - ¾	03/15-06/15	02/15-06/1	02/10-05/31
Switchgrass For well drained - moderately well drained sites use: 'Blackwell', 'Carthage', 'Alamo' For moderately well drained - poorly drained sites use: 'Kanlow', 'Cave-In-Rock', 'Shelter'	10-12 PLS ³	6-10 PLS ³	¼ - ¾	03/15-06/15	02/15-06/1	02/10-05/31

Notes:

¹ Actual dates may vary depending upon establishment method (e.g., conventional vs. sod seeding), soil moisture and soil temperature.

² For the organic, fine-textured soils in the Tidewater Region (MLRA #153B), use dates for the Piedmont (MLRA #136).

³ PLS is a unit of seed measurement (Pure Live Seed) normally used for native grasses.

Woody Plants	Wetness Tolerance: High, Moderate, or Low	Height in Feet at Maturity	Best Suited for Wildlife Food, Cover, Corridor	Best Suited for Living Fences	Best Suited for Boundaries, Contour Guides, and Aesthetics	Well Suited for Screens, Noise Barriers
Alder	High	8-15	X	-	X	-
American beautyberry	Moderate-Low	≤ 8	X	-	X	-
American holly	High-Moderate	≥ 30	X	X	X	X
Apple	High-Moderate	15-30	X	-	X	-
Arborvitae tree-like cultivars	Low	15-30	-	-	X	X
Atlantic white cedar	High	≥ 30	X	X	X	X

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

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Azalea native and non-native	Low	≤ 8	-	-	X	X
Barberry non-native, caution- may spread	Low	≤ 8	-	X	X	X
Blackberry/Raspberry caution- may spread	Low	≤ 8	X	X	X	-
Blueberry	High-Moderate	≤ 8	X	-	X	-
Camellia non-native	Low	8 - 15	-	-	X	X
Chinquapin	Low	8 - 15	X	-	X	-
Chokeberry	High-Moderate	≤ 8	X	-	X	-
Crabapple	High	15-30	X	-	X	-
Crepe myrtle non-native	Low	15-30	X	-	X	-
Eastern hemlock	Moderate-Low	≥ 30	X	-	X	X
False cypress non-native, 'Leyland' and other tree-like cultivars	Low	15-30	-	-	X	X
Flowering dogwood	High-Low	15-30	X	-	X	-
Gallberry	High-Moderate	≤ 8	X	X	X	X
Hawthorn	High-Low	15-30	X	X	X	-
Hazelnut	Moderate	8 - 15	X	X	X	X
Holly, evergreen shrub cultivars 'Helleri', 'Compacta', others, non-native	Low	≤ 8	-	X	X	X
Holly, tree-like cultivar 'Nellie Stevens', 'Savannah', others	Moderate-Low	15-30	X	X	X	X
Juniper tree-like cultivars, non-native	Low	15-30	-	-	X	X
Lespedeza, bush/shrub 'VA-70', 'Amquail', others, non-native, caution: 'Bicolor' may spread voluntarily	Low	≤ 8	X	-	X	-
Mountain laurel	Low	8 - 15	X	-	X	X

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Pieris japonica non-native	Low	≤ 8	-	-	X	X
Plum ornamental or fruiting, native and non-native	High-Moderate	15-30	X	-	X	-
Pyreantha (Firethorn) non-native, caution- may spread	Low	8 - 15	-	X	X	X
Red cedar	Moderate-Low	≥ 30	X	X	X	-
Redbud	Moderate	15-30	X	-	X	-
Redtip (<i>Photinia</i>) non-native	Low	8 - 15	-	-	X	X
Rhododendron R. catawbiensis cultivars & hybrids	Low	≤ 8	X	-	X	X
Sericea dogwood yellow twig, red twig, etc., non-native	Moderate-Low	≤ 8	-	-	X	-
Silky dogwood	Moderate	8 - 15	X	-	X	-
Silky willow	High-Moderate	8 - 15	-	-	X	-
Swamp rose	High-Moderate	≤ 8	X	X	X	-
Sweetbay magnolia	High	≥ 30	X	-	X	X
Viburnums, many native and non-native	Moderate-Low	≥ 30	X	-	X	X
White pine	Low-Moderate	≥ 30	X	-	X	X
Winterberry	High	8 - 15	X	-	X	-
Yaupon	High-Moderate	15-30	X	-	X	X