

USDA
NATURAL RESOURCES
CONSERVATION SERVICE

DELAWARE CONSERVATION
PRACTICE STANDARD

HEDGEROW PLANTING

CODE 422
(Reported by Ft.)

DEFINITION

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

PURPOSE

This practice may be applied for one or more of the following conservation purposes:

1. To provide wildlife food, cover, and travel corridors;
2. To provide food, cover, and shade for aquatic organisms that live in adjacent watercourses;
3. To intercept airborne particulate matter or to reduce chemical drift and odor movement;
4. To provide visual screens to improve landscape appearance and provide barriers to noise;
5. To provide pollinator habitat;
6. To provide substrate for beneficial insects as a component of integrated pest management;
7. To create a living fence;
8. To delineate boundaries and to establish contour guidelines;
9. To increase carbon storage in biomass and soils.

**CONDITIONS WHERE PRACTICE
APPLIES**

This practice may be applied in, across, or around agricultural fields, other open areas, and structures.

This practice does not apply to plantings that are intended to function primarily as field borders, riparian forest buffers, or windbreaks, for which other standards are applicable. Refer to the conservation practice standards for Field Border, Code 386; Riparian Forest Buffer, Code 391, and Windbreak/Shelterbelt Establishment, Code 380.

CONSIDERATIONS

General

Consider the long-term land use objectives of the client. For example, if the land user is interested in using the hedgerow to provide wildlife habitat, consider the plant species that may be suitable for these uses.

Assess site conditions including surrounding land uses, soils, residual herbicides (to the extent known), available moisture during the growing season, and existing vegetation on the site and in adjacent areas, including any noxious weeds which may be present.

Take note of other constraints such as economic feasibility, access, regulatory or program requirements, the need for permits or approvals, and visual aspects.

Hedgerows can be a significant component of a system to support pollinators and beneficial insects. When appropriate, consider the needs of pollinators in plant species selection.

Avoid plant species that may be alternate hosts to undesirable pests or that may be considered invasive or undesirable. Species diversity should be encouraged in order to minimize problems due to species-specific pests.

Consider long-term maintenance requirements of the established vegetation.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the [Natural Resources Conservation Service - Delaware](#) or visit the [Field Office Technical Guide \(FOTG\)](#).

Wildlife Food, Cover, and Corridors

Select plant species that are native or are introduced and are non-invasive, and have multiple values such as those suited for nesting habitat, fruit, seeds, nectar, pollen, browse, protective cover, aesthetics, and tolerance to locally used herbicides.

Consider the seasonal food and lifecycle requirements of the targeted wildlife species and select plant species as appropriate.

Hedgerows can provide wildlife with cover for feeding, loafing, nesting, and caring for young. Consider using hedgerows to improving connectivity between upland, riparian, and wetland habitats. Plant hedgerows to connect other corridors and uncultivated habitats, thus providing protected travel ways for wildlife and improved dispersal networks for other animals and plants.

Dense or thorny shrub thickets provide songbirds with important nesting sites and a refuge to escape predators. However in grassland ecosystems, hedgerows may adversely affect area-sensitive nesting birds (especially songbirds) by fragmenting habitat patches and increasing the risk of predation.

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

If additional wildlife habitat is desired, consider adding an herbaceous field border adjacent to a woody hedgerow to provide food and cover for wildlife.

Consider the adverse impacts of high populations of nuisance wildlife, such as deer and groundhogs, on the establishment and maintenance of vegetation. When feasible, select plant species that are not preferred foods of the nuisance animals and utilize methods for protecting the plants until they become well established.

Also consider the potential for attracting nuisance wildlife into an area, either intentionally or unintentionally. Plantings that contain preferred wildlife foods may attract nuisance wildlife away from valuable agricultural crops or ornamental plantings, but may also result in attracting additional nuisance wildlife into an area.

Intercepting Particulates, Chemical Drift, and Odors

Consider that water quality benefits may arise from using hedgerows to intercept airborne particulates and to trap sediment-attached substances. Hedgerows may also benefit air and water quality by assimilating plant nutrients in leaves and roots.

Visual Screens and Noise Barriers

Hedgerows can be used to reduce the line-of-sight across open areas, concealing unsightly objects behind them from view. Consider the hedgerow design from viewpoints on both sides of the screen.

Consider plant's seasonal display of colors on bark, twigs, foliage, flowers, and fruit. Consider the plant's growth habits (outline, height and width).

A combination of shrubs and/or trees can create more effective screens and barriers than single species plantings. Evergreens provide foliage that can maintain a screen's year-round effectiveness.

Living Fences

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

CRITERIA

Criteria Applicable to All Purposes

Hedgerows shall be established using trees, shrubs, and/or perennial bunch grasses producing erect stems attaining average heights of at least 3 feet and persisting well over winter.

Spacing between and within rows shall be as follows:

Plant Type	Spacing (in feet) for:	
	Visual Screens and Physical Barriers	Wildlife Habitat, Landscaping, and Other Uses
Perennial Bunch Grasses	1 - 2	2 - 4
Shrubs*	2 - 4	4 - 8
Deciduous Trees	6 - 12	8 - 14
Evergreen Trees	6 - 10	8 - 14

*Use a spacing of 2 feet between rows if drilling seeds of leguminous shrubs.

Use staggered spacing in multiple row plantings. Plant taller-growing trees or shrubs in center rows, and medium or lower growing species in outer rows. Or, for a more "natural appearing" effect, intersperse trees, shrubs, and grasses in the hedgerow.

Establishment of vegetation by planting is the preferred method for creating hedgerows. Plant species shall be selected based on the proposed uses of the hedgerow, preferences of the land user, and conditions of the site. Plant growth rates, shade tolerance, soil moisture requirements, and other plant characteristics shall be considered when selecting species. Use of locally native plant species shall be encouraged.

Existing hedgerows may be improved by removing or topping selected less desirable trees or shrubs, thus improving growing conditions for the remaining species. More desirable species can also be interplanted in the hedgerow.

Site preparation and planting to establish hedgerows shall be done at a time and manner to insure survival and growth of selected species. Supplemental moisture shall be applied if needed to assure early survival and establishment of selected species.

Only viable, high quality seed and planting stock shall be used. The method of planting shall include hand or machine planting techniques, suited to achieving proper depths and placement for the selected plant species.

Livestock shall be controlled or excluded as necessary so that the vegetative cover can be established and maintained to meet its intended purpose.

Plant and animal pest species shall be controlled to the extent feasible to achieve and maintain the intended purpose of the hedgerow. Species shall be selected that do not host pest or diseases that could pose a risk to nearby crops. Noxious weeds shall be controlled as required by state law.

Renovation activities, if needed, shall be scheduled to prevent disturbance during the wildlife nesting season.

Note: Specific cost-sharing programs or other funding sources may impose criteria in addition to, or more restrictive than, those specified in this standard.

Additional Criteria for Wildlife Food, Cover, and Corridors

If wildlife habitat is identified as the primary purpose, the hedgerow shall be at least 20 feet wide. Plant at least two species that are native to Delaware. Species shall be selected to provide food, nesting cover, and/or protective cover for the desired wildlife species.

For hedgerows adjacent to small watercourses, the plantings shall be large enough at maturity and installed close enough to shade the watercourse.

If the hedgerow is intended to provide winter protective cover, then at least 25 percent of the planting shall contain evergreen clumps at least 400 square feet in size. The clumps shall be distributed within the hedgerow as needed to provide wildlife with ready access to winter cover.

Hedgerows that are intended to serve primarily as wildlife travel corridors shall be a minimum of 50 feet wide. The height, width, and location of these hedgerows shall be designed so that they connect two or more habitat areas, and provide protective cover and dispersal networks for the desired wildlife species, other animals, and plants.

Additional Criteria for Pollinator Habitat

If the hedgerow is intended to support pollinators, select multiple plant species with different flower colors and blooming periods from early spring through early fall.

Pollinator habitat shall be protected from pesticides that may harm pollinators. If pest control is required, only non-blooming plants will be treated or only utilize pesticides non-toxic to pollinators.

Additional Criteria to Intercept Airborne Particulate Matter or to Reduce Chemical Drift and/or Odor Movement

Orientation of the hedgerow shall be as close to perpendicular to the prevailing wind direction during the period of concern, and between the source of the airborne contaminants and sensitive areas.

When feasible, locate hedgerows both upwind and downwind of the contaminant-producing area to disrupt airflow around it, thus reducing the movement of odor particles downwind from the source. Plant density on the upwind side shall be at least 50% at maturity.

On the downwind side, plantings shall have a minimum density of 65 percent during the months when protection is needed. At least two rows of medium and/or high density plants are usually needed to meet the minimum 65 percent density requirement. For higher levels of protection, use at least three rows of stiff-stemmed perennial grasses, trees, and/or shrubs, with at least one row being evergreen trees.

Tree and shrub species uses shall have foliar and structural characteristics that optimize interception, and adsorption and absorption of particulate matter and airborne chemicals or odors. For plantings adjacent to poultry houses, refer to the appropriate Hedgerow Planting job sheets: *Warm-Season Grasses for Poultry Houses* and *Trees and Shrubs for Poultry Houses* for species selection.

Additional Criteria for Visual Screens, Noise Barriers, and Landscaping

Hedgerows that are intended to serve primarily as visual screens to hide unsightly areas, to reduce

noise, or to buffer other disturbances, shall consist of evergreens in at least one row of the planting to provide year-round screening. Selected plants shall attain a height and fullness sufficient to break the line of sight or baffle sound. Locate noise barriers as close as possible to the source of noise.

For landscaping purposes, plants shall be selected based upon their aesthetic values, such as colorful flowers, fruits, foliage, and plant shape.

Additional Criteria for Living Fences

Selected plants shall attain a size adequate to create a barrier to contain livestock or humans, as needed. If the purpose is to contain livestock, selected plants shall not be poisonous or hazardous to the animals and shall be designed to become sufficiently dense to contain the animals.

Additional Criteria for Boundary Delineation

Hedgerows shall be aligned along boundaries of fields or other open areas to differentiate land management units.

PLANS AND SPECIFICATIONS

Plans and specifications for establishment of the hedgerow shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail concerning site preparation and establishment to ensure successful installation of the practice. Documentation shall be in accordance with the section “Supporting Data and Documentation” in this standard.

For most sites and intended uses of the hedgerow, shrubs and/or trees species shall be selected in accordance with the conservation practice standard for Conservation Cover (Code 327), Tables 3 and 4. Other species that are native to Delaware, or are introduced and are non-invasive, may also be used.

In addition, follow the establishment recommendations provided in the Delaware job sheets for Tree and Shrub plantings. For plantings adjacent to poultry houses, refer to the appropriate Hedgerow Planting job sheets: *Warm-Season Grasses for Poultry Houses* and *Trees and Shrubs for Poultry Houses*. Completed job sheets can serve as the planting

plan for the hedgerow.

OPERATION AND MAINTENANCE

Job sheet(s) or site specific management plans shall be developed and provided to the client to assure performance of the practice as intended. At a minimum, the following components shall be addressed:

1. The control of competing vegetation during plant establishment.
2. The replacement of dead plants, if needed.
3. The extent of management needed to maintain vegetation in the desired species composition or age class (if applicable) or no management required (e.g., natural area).
4. The control of plant and animal pest species, including noxious weeds.
5. Describe the acceptable uses (e.g., grazing, hunting, nature preserve, etc.) and time of year/frequency of use restrictions, if any. Pay particular attention to cost-sharing program requirements as they relate to acceptable vs. restricted uses and other management restrictions.
6. Annual inspections of the hedgerow.

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Field location, extent of the hedgerow in length and width, conservation plan map or sketch showing the location of the practice, and assistance notes;
2. Species selected for establishment, seeding/planting rates, and planting dates;
3. Completed copy of the appropriate Job Sheet(s) or other specifications and management plans.

REFERENCES

1. Belt, S.V., M. van der Grinten, G. Malone, P. Patterson and R. Shockey, 2007. *Windbreak Plant Species for Odor Management around Poultry Production Facilities*. Maryland Plant Materials Technical Note No. 1. USDA-NRCS National Plant Materials Center, Beltsville, MD. 20p.
2. Brown, Melvin L. and Russell G. Brown, 1984. *Herbaceous Plants of Maryland*. University of Maryland, Port City Press, Baltimore.
3. Brown, Russell G. and Melvin L. Brown, 1972. *Woody Plants of Maryland*. University of Maryland, Port City Press, Baltimore.
4. Fish and Wildlife Service, Chesapeake Bay Field Office with the Natural Science Center and Adkins Arboretum, 1995. *Native Plants for Wildlife Habitat*. Annapolis, MD.
5. USDA, Natural Resources Conservation Service. *Conservation Practice Standards*. Delaware Field Office Technical Guide, Section IV.
6. USDA, Natural Resources Conservation Service, *Maryland Wildlife Biology and Management Handbook*.
7. USDA, Natural Resources Conservation Service, August 1999. National Biology Handbook, Part 614.4, *Conservation Corridor Planning at the Landscape Level*.