

**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

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

1. To provide food, cover, and travel corridors for terrestrial wildlife;
2. To provide pollinator habitat;
3. To provide food, cover, and shade for aquatic organisms that live in adjacent watercourses;
4. To intercept airborne particulate matter or to reduce chemical drift and odor movement;
5. To provide visual screens and barriers to noise and dust;
6. To provide substrate for beneficial insects as a component of integrated pest management;
7. To create a living fence;
8. To delineate boundaries;
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 buffers, or windbreaks, for which other standards are applicable. Refer to the conservation practice standards for Field Border (386), Filter Strip (393), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), and Windbreak/Shelterbelt Establishment (380).

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.

For plantings adjacent to poultry houses, refer to the appropriate hedgerow planting fact sheets (*Warm-Season Grasses for Poultry Houses* and *Trees and Shrubs for Poultry Houses*) for spacing requirements.

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

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. Select plant species based on the proposed uses of the hedgerow, preferences of the land user, and conditions of the site.

Use plant species that are native to Delaware or are introduced and are non-invasive (i.e., not likely to spread beyond the planted area and displace native species). Selection of native species shall be a priority when feasible. No plant listed by the state of Delaware as an invasive species shall be established 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. If needed and feasible, apply supplemental moisture to assure early survival and establishment of selected species. For plantings adjacent to poultry houses, installation of a trickle or emitter irrigation system is required if receiving NRCS financial assistance.

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.

Control or exclude livestock as needed to establish and maintain the planting. Control plant and animal pest species to the extent feasible to achieve and maintain the intended purpose of the practice. Control noxious weeds as required by state law.

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. Select species 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. Plan the height, width, and location of these hedgerows 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.

Protect pollinator habitat from pesticides that may harm pollinators. If pest control is required, treat only non-blooming plants or use pesticides non-toxic to pollinators. Insecticides that are less toxic to bees or degrade quickly may be applied over flowers when pollinators are not active, such as in the late evening immediately after bees stop foraging for the day.

Additional Criteria to Intercept Airborne Particulate Matter or to Reduce Chemical Drift and 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 percent at maturity. Use at least one

row of medium and/or high density species, or two rows of low density species.

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.

Tree and shrub species shall have foliar and structural characteristics that optimize interception, adsorption, and absorption of particulate matter and airborne chemicals or odors.

For plantings adjacent to poultry houses, refer to the appropriate hedgerow planting fact sheets (*Warm-Season Grasses for Poultry Houses* and *Trees and Shrubs for Poultry Houses*) for species selection and establishment requirements.

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 be located where they most effectively obstruct a line of sight or block offensive sound. 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 year-round screening, use at least one row of evergreens. Alternatively, one row of densely branched deciduous species may be sufficient to provide the desired amount of screening. The use of deciduous species alone for year-round screening requires prior approval by State Resource Conservationist.

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 appropriate. If the purpose is to contain livestock, select plants that are not poisonous or hazardous

to the animals and are designed to become sufficiently dense to contain livestock.

Additional Criteria for Boundary Delineation

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

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

CONSIDERATIONS

General Considerations

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.

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.

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.

Around buildings and other structures, consider soil quality, especially in terms of compaction and potential contamination with construction debris, gravel, and other fill material. Compaction and inorganic fill materials can severely hinder plant rooting and survival. Consider the need for deep tillage and the addition of soil amendments to improve soil quality.

Consider the need for supplemental watering or irrigation when establishing plantings, especially if containerized stock or balled-and-burlapped plants will be used. Sufficient moisture during the first five years is important for plant survival and overall plant health.

Consider the need for weed control within and between rows. For hedgerows that will be maintained with mowing, consider that plant spacing will need to accommodate mowing equipment.

Consider access routes and the need to maintain space for future expansion when designing hedgerows near buildings. Take note of other constraints such as economic feasibility, regulatory or program requirements, and visual aspects.

Consider that establishing visual screens for animal production and waste facilities may result in fewer odor complaints by neighbors. Hedgerows for controlling odor and dust particles will be more effective as the amount and density of foliage increases. Multiple row plantings are preferable because they provide greater interception than single row plantings. Hedgerows planted near animal facilities may also provide water quality benefits by intercepting nutrients in surface and subsurface water.

When designing hedgerows for poultry houses, consider any additional requirements of the individual poultry company and the need to work with the industry representative to develop a feasible plan.

Additional Considerations for Wildlife Food, Cover, and Corridors

Consider the seasonal food and lifecycle requirements of the targeted wildlife species and select plant species as appropriate. Consider using plants that have multiple wildlife values such as those suited for nesting habitat, fruit, seeds, browse, and protective cover.

Consider using hedgerows to improve connectivity between upland, riparian, and wetland habitats. Plan 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 can 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.

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.

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.

Additional Considerations for 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 improve air and water quality by assimilating plant nutrients in leaves and roots.

Additional Considerations for 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 selecting species with a 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.

Additional Considerations for Living Fences

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

This practice has the potential to affect National Register listed cultural resources or eligible (significant) cultural resources. These may include archeological, historic, or traditional cultural properties. Care should be taken to avoid adverse impacts to these resources. Follow NRCS state policy for considering cultural resources during planning.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice and may be recorded in narrative form, on Implementation Requirements (IR) worksheets, or other approved forms.

For most sites and intended uses of the hedgerow, select shrubs and/or tree species in accordance with the conservation practice standards for Tree/Shrub Establishment (612) or Windbreak/Shelterbelt Establishment (380). For tall, stiff-stemmed grasses, select appropriate species (e.g., big bluestem, indiangrass, switchgrass) in accordance with the conservation practice standards for Conservation Cover (327) or Forage and Biomass Planting (512).

For plantings adjacent to poultry houses, refer to the appropriate hedgerow planting fact sheets (*Warm-Season Grasses for Poultry Houses* and *Trees and Shrubs for Poultry Houses*) to select appropriate species.

Follow the establishment recommendations provided in the Delaware fact sheets for tree and shrub plantings, warm-season grasses, and

hedgerow plantings (for poultry houses) as applicable. Completed fact sheet(s) and 422 IR worksheet can serve as the planting plan for the hedgerow.

The following items shall be addressed, as appropriate:

1. Purpose of the hedgerow;
2. Method of site preparation;
3. Species selected for establishment and planting dates;
4. Length of the hedgerow, number of rows, and spacing within and between rows;
5. Rate and type of soil amendments to be applied (if any);
6. Supplemental watering to be used (if any);
7. Method(s) used to protect plantings from animal damage (e.g., fencing, repellents, tree shelters, etc.) or for weed control (e.g., weed mats, mulch).

OPERATION AND MAINTENANCE

An Operation and Management (O&M) plan shall be prepared and is the responsibility of the client to implement. The appropriate fact sheet(s) and IR worksheet may serve as the management plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

At a minimum, the following components shall be addressed in the O&M plan, as applicable:

1. Inspect the hedgerow at least annually. Shape and replant areas damaged by heavy rainfall, animals, chemicals, tillage, or equipment traffic, and any other areas where the vegetation is not adequate;
2. For areas planted to grasses:
 - a. Maintain vegetation in a vigorous condition. Apply soil amendments periodically, if needed based on soil test results. Follow the maintenance

recommendations in the attached fact sheet(s) for further instructions;

- b. Where wildlife habitat is a concern, do not mow during the primary nesting season (April 15 to August 15).
3. For areas planted to trees and/or shrubs:
 - a. If survival is less than expected during the first two years, replant as needed to achieve the intended purpose of the practice. If native trees and/or shrubs (other than what was planted) become established, and this cover meets the intended purpose of the practice, the cover should be considered adequate. Follow the maintenance recommendations in the attached fact sheet for additional information;
 - b. Nutrients may be applied after the first year, but only if needed based on soil test results;
 - c. If tree shelters are used, remove them before they impede the growth of the trunk. Removal should not occur until the seedling has adequate girth to support itself (usually 3 to 5 years after planting).
 4. Check for insects and diseases, and if an incidence threatens stand survival, take corrective action to keep the pest under control;
 5. Control undesirable plants by pulling, mowing, or spraying with a selective herbicide. Control noxious weeds as required by state law;
 6. Protect the planting from wildfire and damage from livestock, wildlife, and equipment, to the extent feasible;
 7. Describe the acceptable uses (e.g., occasional removal of some tree and shrub products, haying, etc.) and time of year or frequency of use restrictions, if any.

Pay particular attention to program requirements as they relate to acceptable vs. restricted uses and other management restrictions.

SUPPORTING DATA AND DOCUMENTATION

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

1. Location of the practice on the conservation plan map;
2. Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
3. Completed IR worksheet, and copy of the appropriate fact sheet(s) or other specifications and management plans.

REFERENCES

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8. Scott, James D., Jr., 2007. *VEB Tool-Kit: A Guide to Vegetative Buffers for Tunnel-Ventilated Poultry Houses*. Delmarva Poultry Industry, Inc., Georgetown, Delaware.
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11. USDA, Natural Resources Conservation Service. *Conservation Practice Standards*. Delaware Field Office Technical Guide, Section IV.
12. USDA, Natural Resources Conservation Service, August 1999. National Biology Handbook, Part 614.4, *Conservation Corridor Planning at the Landscape Level*.