

**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.
- 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.

**GENERAL CRITERIA**

*Personnel are encouraged to work closely with NRCS state staff forester or biologist when utilizing this practice.*

*Other component practices may be required to establish hedgerows. These*

*practices may include but are not limited to:*

- *Use Exclusion (472)*
- *Tree and Shrub Establishment (612)*
- *Forest Site Preparation (490)*

*Plant Guide and Plant Information Sheets for individual species found in the USDA Plants Database (<http://plants.usda.gov>) may be utilized to supplement the material in this standard.*

*Where feasible natural succession should be utilized to establish hedgerows. If desired, supplemental planting of beneficial tree/shrub species should be added. An adequate seed source must be nearby or adjacent when using natural succession to establish a hedgerow.*

*Site prep and planting methods used will be designed to protect the soil from erosion.*

*Site preparation, establishment, planting dates, methods and care in handling and planting of stock shall be in accordance with the criteria of WV Practice Standards 612, Tree/Shrub Establishment and (490) Forest Site Preparation.*

*Necessary site preparation and planting shall be done at a time and manner to ensure survival and growth of selected species.*

*Only viable, high quality and adapted planting stock will be used. Seed/stock viability will be determined prior to planting. Site preparation shall be sufficient for establishment and growth of selected species and performed in a manner that does not compromise the*

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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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***intended purpose.***

***Planting rates will vary with intended purpose and species but shall be adequate to accomplish the planned purpose.***

Plants selected must be suited and adapted to the soils, climate and conservation purpose.

No plant listed by the state as a noxious weed shall be established in a hedgerow.

***Native plant materials will be used whenever possible.***

The practice shall be protected from livestock grazing and trampling to the extent necessary to ensure that it will perform the intended purpose(s).

***Undesirable*** vegetation shall be controlled until the hedgerow becomes established. Control shall continue beyond the establishment period, if necessary.

All planned work shall comply with federal, state and local laws and regulations.

***The method of planting hedgerows shall include hand or machine planting techniques and be suited to achieving proper depths and placement of planting stock roots.***

***Selection of plants and spacing depend on purpose. Multiple rows should be used where feasible and plants should be staggered between rows. If necessary, spacing between rows should allow enough room for maintenance equipment.***

***The planned plant species will be tolerant of any nutrient, pesticide, mine drainage or other chemical loading, where such loading cannot be corrected.***

Hedgerows shall be established using woody plants, attaining average heights of at least 3 feet and persisting well over winter.

***For selection of species to be encouraged through natural succession or those that may be planted, refer to Appendix I of the Tree and Shrub Establishment (612). Other species may also be suitable for use in hedgerow planting. Consult the NRCS***

***state staff biologist or forester to determine suitability.***

***Plant densities for trees and shrubs will depend on their potential height at 20 years of age. Heights may be estimated based on any of the following:***

- 1) documented performance of the individual species on adjacent or nearby areas on similar sites under similar conditions;***
- 2) documented heights in the USDA Plants Database for a particular species and use;***
- 3) "20-year" and "mature" heights listed in Appendix I of Tree and Shrub Establishment (612) standard;***

***Methods to protect plantings when livestock have access to the area shall be designed and installed according to WV conservation practice standards Use Exclusion (472) and/or Fence (382).***

***In most instances, other exclusionary measures will be necessary to protect plantings from browse by wildlife at least during the establishment period. These devices should be identified in the (612) Tree Shrub Establishment specification (i.e. tree tubes).***

#### **Additional Criteria for Living Fences**

Selected plants shall attain a size adequate to create a barrier to contain livestock or humans, as needed. ***Refer to those species listed in Appendix I of the (612) Tree Shrub Establishment and the heights listed for 20 years and maturity.***

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

#### **Additional Criteria for Screens and Barriers to Noise and Dust**

***If screening or tight thickets are desired, spacing of plants should be closer to the minimum range shown in Appendix I of the (612) Tree and Shrub Establishment or as indicated in the USDA Plant Sheet/Guide.***

**Spacing should be adequate to allow crown closure at maturity for the selected species.**

**Species selection criteria may be based upon improved aesthetics, seasonal foliage color, showy flowers, foliage texture, form, and branching habit. The layout and design shall be appropriate for the setting as determined by adjacent land uses, landowner objectives and purpose.**

**Additional Criteria for Screens and Noise Barriers**

Screening hedgerows provide privacy, hide unsightly areas from view or reduce noise.

Hedgerows shall be located where they most completely obstruct a line of sight or offensive sound.

Selected plants shall attain a height and fullness sufficient to break the line of sight or baffle sound.

**Species selection criteria may be based upon improved aesthetics, seasonal foliage color, showy flowers, foliage texture, form, and branching habit. The layout and design shall be appropriate for the setting as determined by adjacent land uses, landowner objectives and purpose.**

**Additional Criteria to Provide Food, Cover and Corridors for Terrestrial Wildlife.**

Establish at least two species of native **woody** vegetation.

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

**If wildlife food and cover is identified as a purpose, the minimum hedgerow width, at maturity, shall be 25 feet. This may necessitate the establishment of more than one row of plants.**

In plantings adjacent to small watercourses, the plantings shall be site-adapted, large enough at maturity and installed close enough to shade the watercourse.

**Species and spacing suitable to provide wildlife food and/or cover will be selected from Appendix I of the WV conservation practice standard Tree and Shrub**

**Establishment (612) or as specified in the USDA Plants Database Plant Guide/Sheet.**

**If tree/shrub fruit production is desired to provide a wildlife food source, the spacing of plants should be closer to the maximum range shown in Appendix I allowing for maximum crown development at maturity or as indicated in the corresponding USDA Plant Sheet/Guide.**

**Wildlife habitat requirements may be obtained from those species listed in the West Virginia Wildlife Habitat Evaluation Technique (WVWHET).**

**If the hedgerow is intended to provide winter protective cover, at least 25 percent of the total area of the hedgerow shall contain evergreen species. Sections may be distributed within the hedgerow as needed to provide wildlife with ready access to winter cover.**

**Wildlife corridors (travel lanes) are linear plantings that provide cover and food for wildlife, while allowing ease and safety of movement through areas lacking these attributes. Hedgerows that are intended to serve primarily as wildlife corridors shall be a minimum of 35 feet wide. The height, width, and location of these corridors shall be designed so that they connect two or more habitat areas, and provide protective cover and dispersal networks for the desired animal species.**

**If planting is required, corridors should consist of a minimum of three staggered rows of trees and/or shrubs. Plant species should consist of both hard and soft mast producers where feasible.**

**Species suitable for wildlife corridors will be selected and spaced according to Appendix I of the WV conservation practice standard Tree and Shrub Establishment (612) or as indicated in the USDA Plants Database Plant Guide/Sheet.**

**Additional Criteria for Boundary Delineation**

Hedgerows shall be aligned along boundaries of fields, or forestlands to differentiate land management units.

### **Additional Criteria for 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.

### **Additional Criteria for Improvement of Landscape Appearance**

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

***Species selection criteria may be based upon improved aesthetics, seasonal foliage color, showy flowers, foliage texture, form, and branching habit. The layout and design shall be appropriate for the setting as determined by adjacent land uses, landowner objectives and purpose.***

***Species and spacing suitable for this purpose will be selected from Appendix I of the WV conservation practice standard Tree and Shrub Establishment (612) or as specified in the USDA Plants Database Plant Guide/Sheet.***

### **Additional Criteria for Reducing Particulate Matter Movement**

The hedgerow will be oriented as close to perpendicular to the prevailing wind direction as possible.

Hedgerow density on the upwind side shall be at least 50% at maturity.

Hedgerow density adjacent to the particulate source shall be at least 65% at maturity.

***Refer to WV conservation practice standard Windbreak (380) for more information regarding the placement and positioning of plants for this purpose.***

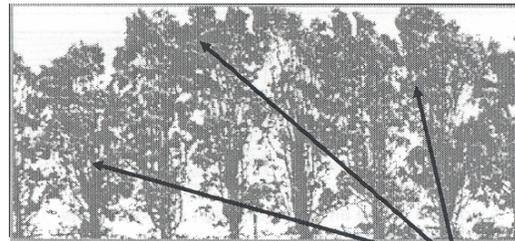
***Species and spacing suitable for this purpose will be selected from Appendix I of the WV conservation practice standard Tree and Shrub Establishment (612) or as specified in the USDA Plants Database Plant Guide/Sheet.***

### **Additional Criteria to Reduce Odor Movement and/or Chemical Drift**

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 odor or chemical drift and the sensitive and the sensitive areas.

Hedgerows shall be located upwind of the odor producing area and the chemical application area.

Tree and shrub species used shall have foliar and structural characteristics that optimize interception, adsorption and absorption of airborne chemicals or odors. ***For the most part, vegetative species should be tolerant of the chemicals they are intercepting.***



Density is the percentage of the solid portion of the hedgerow to the total area of the hedgerow.

***Hedgerow density on the upwind side shall be at least 50% at maturity.***

***Hedgerow density adjacent to the source shall be at least 65% at maturity.***

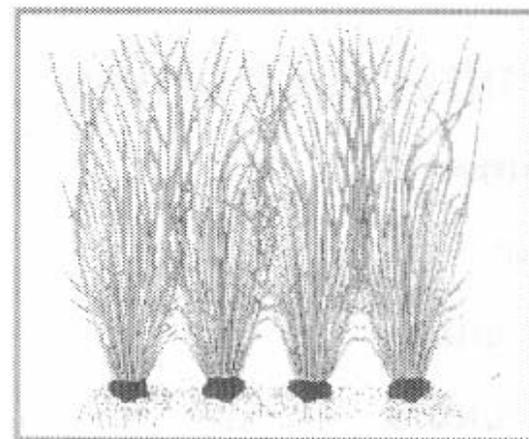


Illustration of 50-60% density.

***Species and spacing suitable for this purpose will be selected from Appendix I of the WV conservation practice standard Tree and Shrub Establishment (612) or as***

*specified in the USDA Plants Database Plant Guide/Sheet.*

#### **CONSIDERATIONS**

*Consider using this practice to provide food and cover for aquatic organisms that live in watercourses with bank-full width less than 5 feet.*

*Consider alternative water sources, such as tanks, ponds, wells, solar pumps, and ram pumps for livestock water supply needs if necessary.*

*Consider adding herbaceous plantings to the hedgerow to increase diversity or habitat functions.*

*Consider the effects of deer and small mammal browse when establishing vegetation.*

*Consider shading effects of tall hedgerows on adjacent structures and areas such as cropfields.*

*Consider associated insect, pest and disease problems when selecting tree and shrub species (e.g. cedar - apple rust)*

*Consider shade tolerance when selecting tree and shrub species to plant.*

*Consider the ease of establishment and availability of planting stock when selecting species to plant.*

*Consider the drainage class and soil type prior to plant selection.*

*Consider the effects on water budget, especially on volumes and rates of runoff, infiltration, evaporation and transpiration.*

*Consider the effects of adjacent land uses on the hedgerow.*

*Consider long term heights and effects on adjacent roads and utilities.*

*Consider the effects of noxious and invasive weeds on establishment and maintenance of hedgerows.*

*Consider wind direction when determining locations of plantings.*

*Consider the effects on erosion and the movement of sediment and soluble and sediment attached substances carried by runoff.*

*Consider the effects of snowcatch and melt on individual plants.*

*Consider the use of native, warm-season grasses in and adjacent to hedgerows. These bunch grasses provide good nesting sites for ground-nesting birds, and the open spaces between plants allow good feeding habitat for birds and small mammals.*

Consider planting a hedgerow larger than the minimum length and width to increase the amount of carbon stored in the soil and biomass.

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

Consider water quality benefits that 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.

Consider the ability of hedgerows to increase surface water infiltration by improving soil structure around its root zone. However, evapotranspiration may reduce groundwater recharge benefits.

Consider the ability of hedgerows to incidentally trap snow or soil. Although not a primary purpose, hedgerows may incidentally trap wind blown snow or soil.

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 be recorded using approved specification sheets, job sheets, or narrative documentation in the conservation plan, or other acceptable documentation.

**Other components necessary to implement this practice should be referenced as appropriate (e.g. Tree and Shrub Establishment (612)).**

**At a minimum the following will be identified in the conservation plan (as appropriate):**

- **The purpose of the hedgerow;**
- **Hedgerow location;**
- **Hedgerow length and width;**
- **Species selected for planting and any supplemental information including USDA Plant Database Plant Guide Sheets or Plant Information Sheets;**
- **Establishment method(s) and date(s);**
- **Operation and Maintenance**

## **OPERATION AND MAINTENANCE**

Vegetation shall be maintained to ensure continued control of odor movement and chemical drift.

Supplemental planting may be required when survival is too low to produce a continuous hedgerow.

Vegetation shall be protected from unwanted fire and grazing throughout its life span.

Pests shall be monitored and controlled.

**The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).**

**Where practical, management activities will be performed outside the primary nesting season March 15 - July 15. An exception may be for mowing or cultivation during the establishment period to control vegetative competition.**

**Pruning, thinning and removal of plants should be performed at least annually and**

**timed so as not to interfere with the lifecycle of the plants or the intended purpose of the hedgerow.**

**Removal of diseased plants or limbs shall occur immediately upon detection.**

**Monitoring and replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the hedgerow is fully functional.**

**The hedgerow will be continuously protected from fire, grazing and trampling. Cultivation for a year or two may be desirable if plant competition becomes a problem.**

**The hedgerow should be inspected after heavy storm events. Check for areas where water, ice or snow is concentrated and may cause damage to plants and take corrective actions as necessary.**

**Additional operation and maintenance requirements may be developed on a site-specific basis to assure performance of the practice as intended.**

Periodic applications of nutrients may be needed to maintain plant vigor.

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

## **REFERENCES**

**USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.**

**Strausbaugh, P.D. and E.L. Core, 1977., Flora of West Virginia., Second Edition, Seneca Books Inc., Morgantown, WV**

**Wharton, M.E., Barbour, R., 1973. Trees and Shrubs of Kentucky., University Press of Kentucky., Lexington, KY**

**Little, E.L., 1980., The Audubon Society Field Guide to North American Trees Eastern Region., Chanticleer Press Inc., New York, NY 10022**

***Hardin, J.W., White, F., 1991., Textbook of Dendrology, Covering the Important Forest Trees of the United States and Canada, McGraw-Hill, Inc., New York, NY 10022***

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

***\* Bold italics indicate changes made or information added to the national standard by West Virginia.***