Natural Resources Conservation Service

NEW JERSEY CONSERVATION PRACTICE STANDARD

HERBACEOUS WIND BARRIERS

Code 603

(Ft.)

DEFINITION

Herbaceous vegetation established in narrow strips within the field to reduce wind speed and wind erosion.

PURPOSE

- Reduce soil erosion (wind erosion: saltation, creep, and suspension)
- Reduce soil particulate emissions to improve air quality.
- Improve plant health by reducing crop damage by wind or wind-borne soil particles.

CONDITIONS WHERE PRACTICE APPLIES

Cropland where wind erosion is a resource concern.

CRITERIA

General Criteria Applicable to All Purposes

Practice is designed to reduce wind speed and wind erosion to the planned soil loss objectives using current wind erosion prediction technology.

Herbaceous plant materials that are used include the following characteristics:

- Perennial, annual or mix
- Adapted to local site conditions (i.e., soil and climate factors)
- Erect growth habit with stiff stems
- Resistant to lodging and strong leaf retention
- Tolerant to soil deposition
- Minimize competition to adjacent crop growth

The wind barrier orientation, spacing, composition, width and height needed to achieve the desired purpose shall be designed using the current NRCS approved wind erosion prediction technology.

Wind barriers are installed across the prevailing wind erosion direction as determined by site conditions and current wind erosion prediction technology soil loss objectives for the planned crop system.

Where both wind and water erosion is a concern, orient the wind barriers to address both wind and water erosion (avoid water accumulation and erosion adjacent to the barriers going up and down slope).

Wind barriers consist of one or more rows that provide the required porosity to achieve the planned soil loss objective. Row spacing within the wind barrier width is no greater than 36 inches.

Spacing between wind barriers is measured along the prevailing wind erosion direction during the critical wind erosion period(s) for the field. Barrier spacing does not exceed 10 times the planned wind barrier height, plus or minus 10 percent to accommodate equipment width and achieve the planned soil loss objective.

Additional Criteria to Reduce Soil Erosion and Particulate Generation

Wind barriers have a minimum expected height of 1.5 feet and porosity of 40 to 50 percent during the wind erosion periods for which the barriers are designed.

Additional Criteria to Protect Growing Crops from Damage from Wind or Wind-borne Soil Particles

During periods when sensitive crops are susceptible to damage by wind and wind-borne soil particles, wind erosion estimates do not exceed the crop tolerance as specified in the National Agronomy Manual (part 502) or other planned crop protection objectives.

Barriers designed for this purpose have a minimum expected height of 1.5 feet and porosity of 40 to 50 percent during the wind erosion period when growing crops need protection.

CONSIDERATIONS

Herbaceous wind barriers are most effective when combined with other conservation practices as a resource management system.

Herbaceous wind barriers are more suitable than field windbreaks for use under center pivot and linear move irrigation systems due to height considerations. Windbreaks may be locate outside the windward edge of the system.

Adjust the spacing of barriers within the field within the limits of criteria above to accommodate width of field operations and minimize partial or incomplete passes.

Manage pest control in adjacent fields with techniques and pesticides that will not irreversibly damage the vegetation in the herbaceous wind barrier.

When compatible with the purposes and criteria for this practice, plant materials can be selected to attract undesirable insects away from crops or desirable insects that are beneficial to the adjacent crops.

When compatible with the purposes and criteria for application of this practice, plant materials can be selected that enhance food and cover for targeted wildlife. If the barrier is also designed to provide escape or nesting cover for wildlife, locate barriers where they connect areas of existing perennial vegetation whenever possible and include plants that will have a minimum expected height that provides adequate cover for the targeted species. Barriers that connect areas such as woody draws often provide additional escape and travel cover. Two or more rows are often more effective than one row, with a minimum width of two feet between rows. Stiff stems are important in providing cover during severe winter storms.

Utilize supporting erosion control practices in the conservation system along with thoughtful positioning of this practice to reduce the risk of concentrated flow along the barrier.

Where damage to barriers by grazing animals is a concern, selection of plant species less palatable to animals may reduce damage.

Where water erosion from melting snow, accumulated within the barrier system, is a concern, supporting erosion control practices such as residue management can reduce the hazard. Where feasible, aligning barriers across the slope can enhance moisture infiltration and reduce erosion from runoff.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for each field site where Herbaceous Wind Barrier will be installed. Record practice specifications on the Herbaceous Wind Barrier Implementation Requirement document. Plans and specifications will include:

- Conservation purposes for the herbaceous wind barrier(s)
- Benchmark crop system wind erosion estimates
- Predominant wind erosion direction from benchmark simulation
- Planned crop system with herbaceous wind barriers wind erosion estimates
- Planned barrier number and positions within the field
- Planned barrier effective height, width, porosity and orientation to the wind erosion direction
- Planned crop strip width between barriers
- Plant materials used, seeding rate, method, and timing
- A field map showing the planned positioning of the wind barriers

OPERATION AND MAINTENANCE

Annual barriers shall be reestablished each year by planting at recommended dates, leaving rows standing and maintained throughout the critical periods for which the barrier was designed.

Gaps in wind barriers (e.g., 10-15 feet) shall be reestablished as soon as practical to maintain barrier effectiveness.

Nutrients are supplied as needed and weeds are managed to maintain the planned growth and effectiveness of the wind barriers.

When barriers become ineffective due to sediment accumulation or begin to accumulate runoff along the leading edge of the barriers, reposition and reestablish the wind barriers as needed after leveling the accumulated sediment.

Barriers shall be reestablished and/or relocated as needed to meet the purposes for this practice.

REFERENCES

Brandle, J.R., D.L. Hintz, and J.W. Sturrock; 1988. Wind Break Technology. ISBN 0-444-43019-9. Elsevier Science.

CORE4 Conservation Practices – The Common Sense Approach to Natural Resource Conservation; 1999. USDA, NRCS.

National Agronomy Manual. 190-V. 3rd ed., Part 502, Wind erosion; 2010. USDA, NRCS.

Skidmore, E.L. and N.P. Woodruff; 1968. Wind Erosion Forces in the United States and their use in predicting soil loss. Agriculture Handbook 346. USDA.

USDA-NRCS. PLANTS Database; 2010. http://plants.usda.gov. (Verified April 2010).