



VEGETATIVE ENVIRONMENTAL BUFFERS & WINDBREAKS

Vegetative Environmental Buffers (VEB's) are windbreaks designed to reduce energy costs year-round. Whether climate-controlled air leaks out or outside air seeps in, your fuel costs rise.

Studies prove well-placed **VEBs reduce fuel use by 18 to 25 percent.** Save even more with reduced fan back pressure caused by direct strong winds.

MORE SAVINGS 'UNDER YOUR NOSE'

Production and processing facilities can produce objectionable odors. Registered complaints often result in costly government citations. If facility modifications can't meet the problem, VEB technology may be the answer. **Specific plant materials planted in VEB-style can neutralize odors and reduce negative views.**

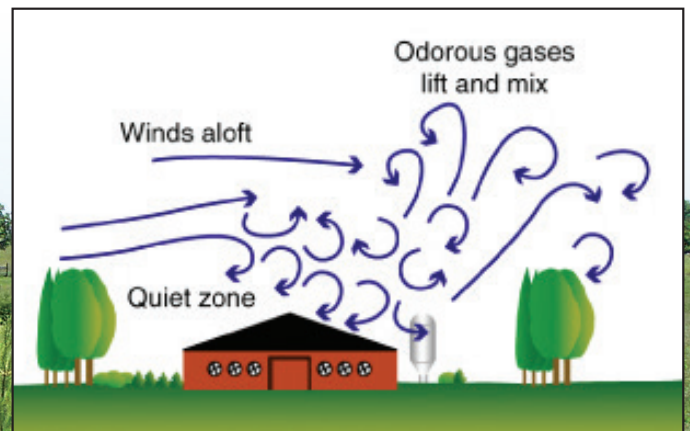
HOW DOES A VEB WORK?

1. **VEB change airflows.** This protects and insulates buildings while diluting and dispersing odors.
2. **Plants collect and filter.** Odorous dusts and aerosols collect on leaves, needles and branches.
3. **Chemical constituents of odors collect and store** in tree wood.
4. **Odors remain** within the parameters of VEB.
5. **Wind erosion reduces** on adjacent crop fields.
6. **Improves views with visual screens.**

Planting VEBs around the entire facility perimeter is ideal.

VEBs upwind of the facility move the airflow up and over odor sources. Fresh air can then mix with and dilute odors and dust. Plant VEBs at least 75 to 100 feet from roads and driveways to avoid snowdrift accumulation.

discover the
APM DIFFERENCE



VEB & WINDBREAKS

GETTING STARTED

Sounds complicated, but getting started is as simple as meeting with your local Natural Resources Conservation Service (NRCS) agent. The agent will either visit the site in person or look at it from aerial photos.

COST SHARE OPPORTUNITIES

Property location and size helps determine scope, cost and potential cost share merit. Final approval on benefits rest with NRCS. Drip irrigation for your windbreak is cost-shared by NRCS and is sometimes required. Continuous weed mat or mulching is also recommended and cost-shared. The Environmental Quality Incentives Program (EQIP) also offers cost share programs.

Find your local NRCS office at www.nrcs.gov, or by calling Forrest Keeling Nursery 800-356-2401.

PLANT SPACING AND CALCULATING NUMBER OF PLANTS NEEDED

Plant trees 10–15 feet apart on center, with an average 20 feet between tree and shrub rows. Shrubs can be closer at 6–8' apart.

The number of plants needed for your windbreak will depend on length, width and plant spacing. For example, a three-row, four-sided windbreak with two, 2,000' sides and two, 1,500' sides. (a total perimeter of 5,000 linear feet) will need:

830 shrubs or small trees + 500 evergreen trees + 500 deciduous trees



WATERING NEWLY PLANTED LANDSCAPE

- Daily for 7 to 10 days
- Then every other day for the next 2 weeks
- Once per week when rainfall is less than 3/4 to 1 inch

WHAT SPECIES TO CHOOSE

Refer to our list of suggested species below of plant materials. Your NRCS agent can help guide your final selection. Points to consider include:

1. **Facility location.** Plant zone, available sunlight and moisture, and soil type are key. Choosing the right plants can help reduce maintenance and ensure project success.
2. **Site characteristics.** Check power lines, fences, roadway visibility and existing buildings. Consider facility function and the mature size of species for compatibility.
3. **Soil conditions.** Your NRCS agent can help arrange a soil test to determine your soil's health and quality. A final report may recommend soil amendments.

SUGGESTED SPECIES INCLUDE:

Evergreen Trees

Eastern Red Cedar, *Juniperus virginiana*
Pitch x Loblolly Hybrid Pine, *Pinus rigida x taeda*
Shortleaf Pine, *Pinus echinata*
White Pine, *Pinus strobus*
Norway Spruce, *Picea abies*

Deciduous Trees

Bald Cypress, *Taxodium distichum*
Hackberry, *Celtis occidentalis*
Pin Oak, *Quercus palustris*
Bur Oak, *Quercus macrocarpa*
Swamp White Oak, *Quercus bicolor*

Shrubs

Buttonbush, *Cephalanthus occidentalis*
Black Chokeberry, *Aronia melanocarpa*
Red Chokeberry, *Aronia arbutifolia*
Gray Dogwood, *Cornus racemosa*
Red-twig Dogwood, *Cornus stolonifera*
Rough-leaf Dogwood, *Cornus drummondii*
Silky Dogwood, *Cornus amomum*
Yellow-twig Dogwood, *Cornus stolonifera flavinera (sericea)*
Elderberry, *Sambucus canadensis*
Indigo Bush, *Amorpha fruticosa*
Ninebark, *Physocarpus opulifolia*
Fragrant Sumac, *Rhus aromatica*
Smooth Sumac, *Rhus glabra*
Arrowwood Viburnum, *Viburnum dentatum*
Blackhaw Viburnum, *Viburnum prunifolium*
Cranberrybush Viburnum, *Viburnum trilobum*
Nannyberry Viburnum, *Viburnum lentago*