

# FARMSTEAD WINDBREAK

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Trees are important around homes in our communities to provide wind protection, shade, fruit, beauty and collect snow. In the same way, windbreaks provide these benefits to the farmstead.

A multirow farmstead windbreak creates a protected zone or microclimate on the leeward side (Figure 1). Large windbreaks surrounding

farmsteads become an island in the open spaces of the prairie. Multirow farmstead windbreaks provide several benefits:

(1) **Wind protection** provides more comfortable working conditions in summer and winter. Physical damage to buildings, paint, windows, roof and other structures is reduced.

(2) **Snow collection and control of drifting** in farmstead work areas, drives and travel lanes is important for winter farm activities. Set backs of 150-200 feet from a roadway are required by county governments to prevent snow collection. Buildings should be set a minimum of 200 feet from windbreaks .

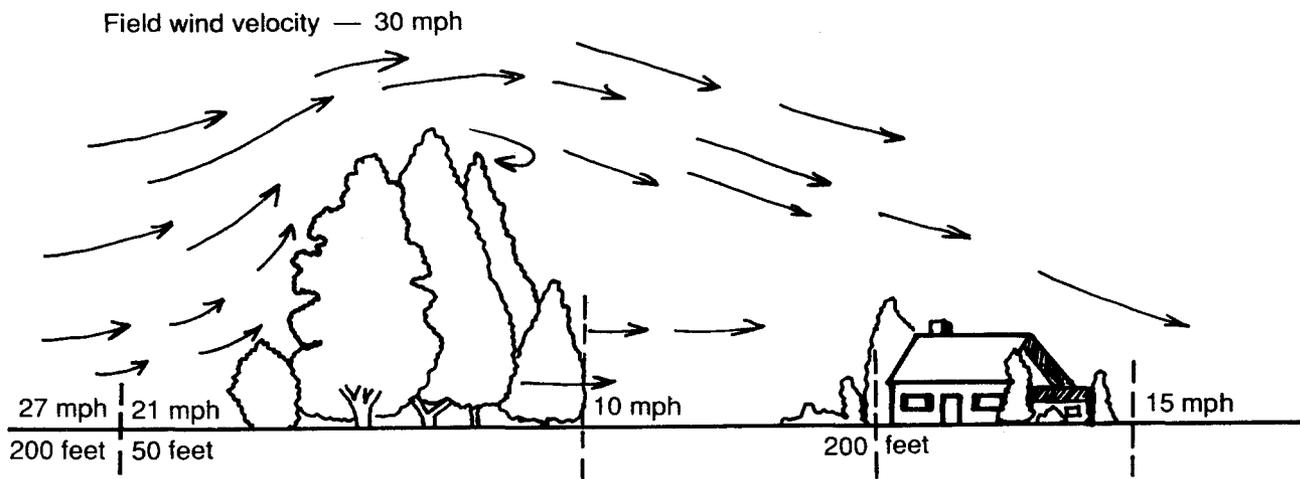


Figure 1. Windbreak protection zone

- (3) **Energy savings** and reduced heating costs for farm buildings from windbreak protection have significant economic impacts to farm families. Savings of up to 40 percent have been documented in buildings protected by windbreaks compared to unprotected buildings. During the summer, shade on east and west sides of homes, shops and other buildings can reduce air conditioning costs. Shading of outside air conditioner unit will also effectively reduce costs as well. Shade and evergreen plantings can help supplement the energy savings provided by windbreaks.
- (4) **Aesthetic beauty** can be improved by using trees and shrubs with ornamental flowers, foliage, bark and fruit. These types of plant materials complement the landscape around the home and farmstead. Screen plantings separate working areas from the private yard activities. Ornamental trees and shrubs are an investment in long term property value. Tree and landscape plantings are estimated to be up to 20 percent of the farmstead value.
- (5) **Harvestable products** from windbreaks include wood products, wildlife, and fruits. Firewood, fence posts, small lumber and animal bedding chips can be produced from windbreaks. Wildlife utilize windbreaks for food, habitat and cover, so windbreaks are important for hunters as well as songbird enthusiast. Many birds that nest in windbreaks eat insect pests on neighboring crops. Fruit trees and shrubs such as apple, chokecherry, sandcherry, gooseberry, and currant can be integrated into a farmstead planting to provide food for wildlife as well as for personal use.
- (6) **Screening and filtration** of blowing soil or dust particles from fields and gravel roads is important to the conditions of various farmstead activities. When in bloom, flowering trees and shrubs will provide a pleasant fragrance to the air.

## Farmstead Windbreak Design

Most farmstead windbreaks vary in size from five to 15 rows. The proximity of the farmstead to roads and other property boundaries may restrict the size of windbreaks due to set backs from roadways and buildings (see Figure 2).

If the size of the windbreak is limited, then the use of tree species with dense foliage is important. The use of conifers in smaller belts will increase the density and, therefore, the amount of the snow collected next to the belt.

The distance from the tree planting to the farmstead is important to prevent drifts from forming around the buildings. If trees are planted too close to the buildings snow collection could prevent entrance to or use of the buildings (see Figure 4).

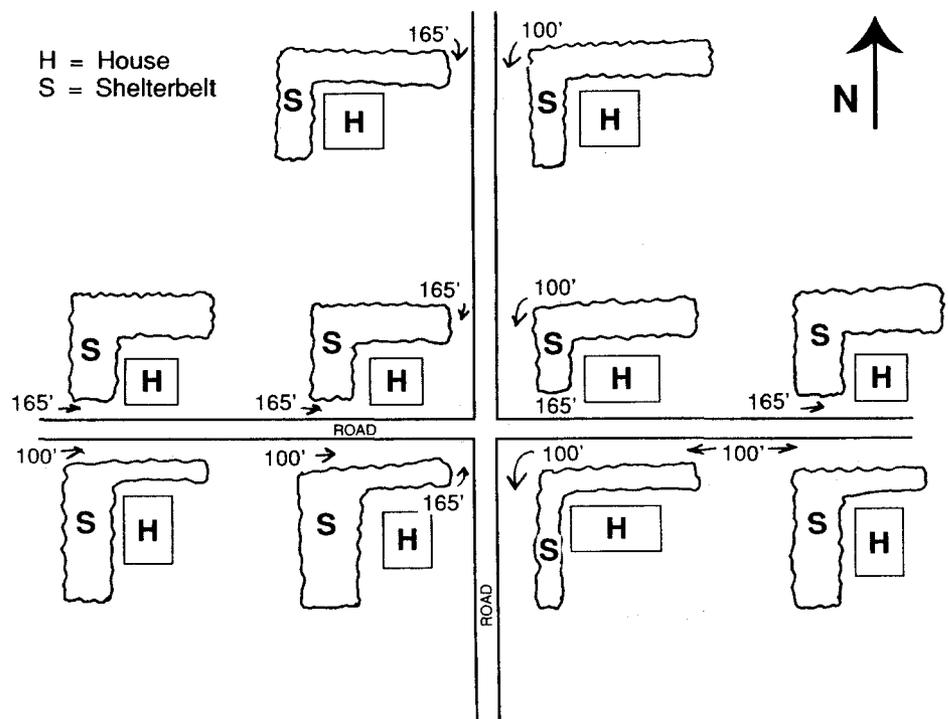
Placement of the driveway is important to prevent snow drifts and facilitate clearing. Driveways should come through the windbreak at an angle to prevent winds from being channeled through the opening.

A larger windbreak provides more opportunities for species diversity. The greater the species diversity, the less chance the windbreak could be lost from an insect or disease attack. Also, a larger windbreak will provide greater wildlife habitat benefits.

When selecting tree species for wildlife enhancement, include a wide variety of fruiting trees and shrubs for food and dense growing conifers, deciduous trees and shrubs for shelter and cover. Wildlife food plots such as sorghum and corn can be planted in strips along the edges of shelterbelts to encourage wildlife use.

## Twin-Row High-Density Snow Trap Design

This design involves a closely spaced 5 feet between rows and 5 feet between trees in a twin row. The species commonly used include green ash, eastern red cedar, Rocky Mountain juniper, Ponderosa pine and a variety of shrubs. The twin row design is recommended for use 40 to 60 feet outside the farmstead shelterbelt to collect snow more effectively



**Figure 2. Space limitations of windbreaks relative to location along property lines and roads. All distances are measured from the center line of the road.**

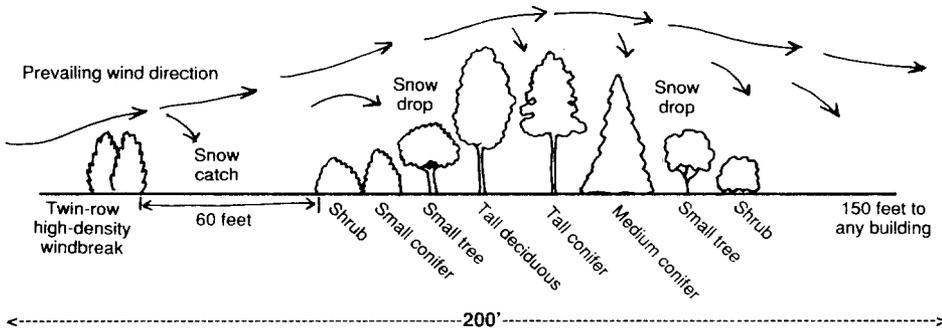


Figure 3. Cross section of a 10 row farmstead windbreak.

Table 1. Examples of potential tree and shrub species arrangement.

- A – Twin Row**  
Rocky Mountain Juniper  
Eastern Red Cedar • Tall Shrub
- B – Shrub**  
Caragana • Common Lilac  
Late Lilac • Cotoneaster
- C – Small Conifer**  
Rocky Mt. Juniper  
Eastern Red Cedar
- D – Small Deciduous Tree**  
Russian Olive • Amur Maple  
Harbin Pear • Hawthorn
- E – Tall Deciduous Trees**  
Green Ash • Hackberry  
Cottonwood • Bur Oak
- F – Tall Conifer**  
Ponderosa Pine • Scotch Pine
- G – Medium Conifer**  
Colorado Spruce  
Black Hills Spruce
- H – Small Tree**  
Russian Olive • Apple  
Amur Maple • Harbin Pear  
Hawthorn
- I – Shrub row**  
Nanking Cherry • Buffaloberry  
Chokecherry • Currant  
Russian Almond  
Meadowlark Forsythia

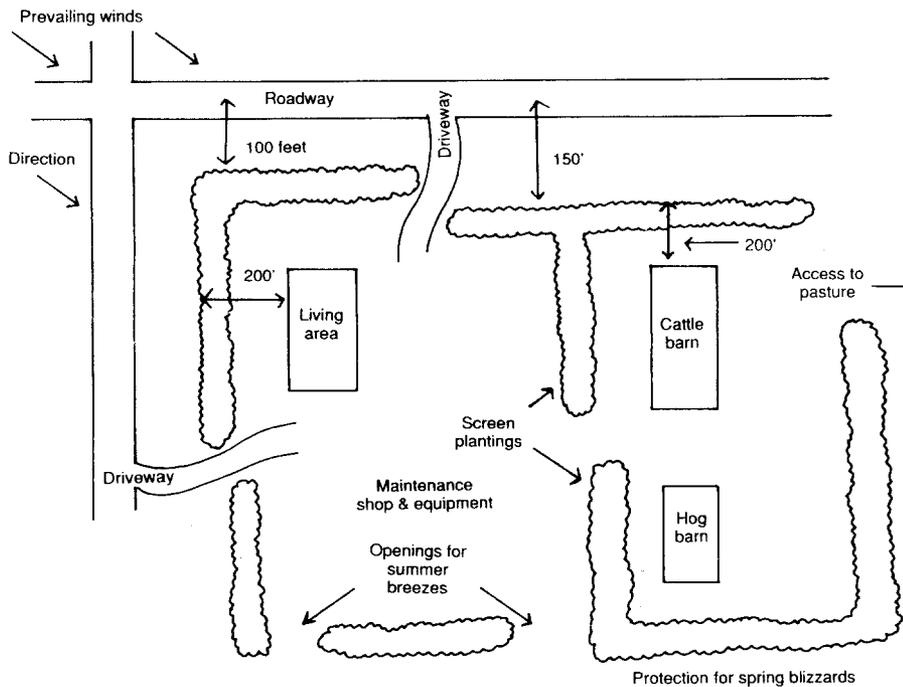


Figure 4. Farmstead diagram showing ideal location of shelterbelt in relation to buildings and feedlot; also shown are shelterbelt openings for access to public road and adjacent field. Note: location of some terrain features will affect prevailing winds.

outside of the farmstead. This design is very effective in heavy snow fall areas. The area in between the twin row and multirow shelterbelt can be utilized during the growing season for specialty crops such as sweet corn, vegetable, and small fruits. This area becomes a snow harvested area with increased soil moisture and is highly protected from drying summer winds.

## Driveway Considerations

Driveways and access roads through windbreaks can be problem

areas for snow collection. Figure 6 presents several designs that can be used and problems to avoid. The offset tree rows provide the less chance of snow drift problems and easy access to and from the farmstead to roads or fields.

## Custom Designs

Farmstead shelterbelts can be designed to fit any size or shape of farmstead and the associated operations. Utilizing the traditional multirow and twin row windbreak designs increases opportunities for protection and farmstead activities.

For more information contact your county office of the NDSU Extension Service, USDA Soil Conservation Service or local Soil Conservation District.

## Sources of adapted figures:

- #1 USDA Soil Conservation Service
- #2 University of Minnesota Extension Service
- #3 NDSU Extension Service
- #4 NDSU Extension Service
- #5 Kansas State University Extension Service
- #6 North Central Extension Publication on Farmstead Planning

## Tables:

- #1 NDSU Extension Service

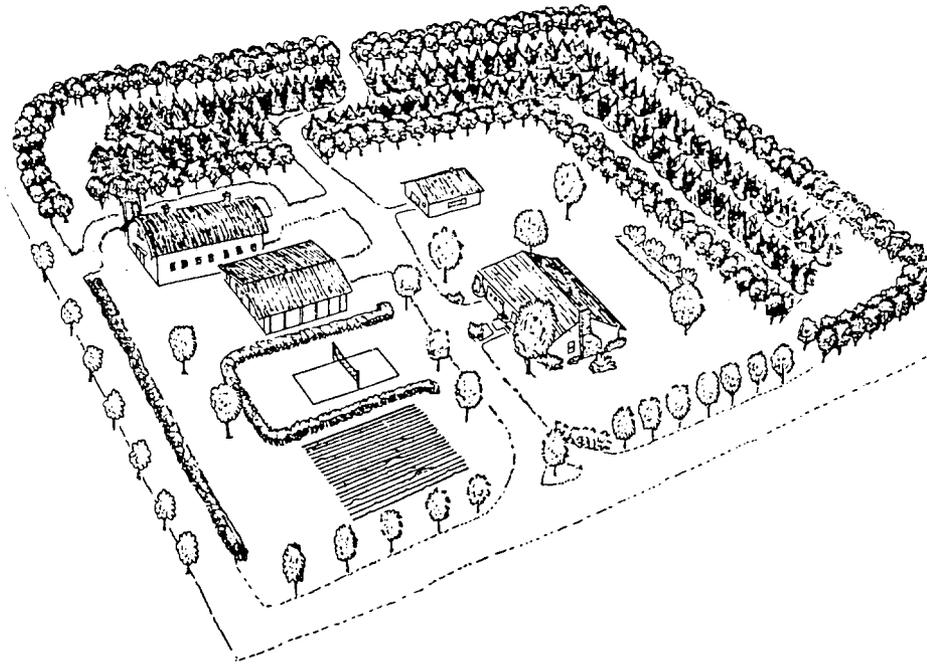


Figure 5. Typical farmstead windbreak in combination with twin-row high-density windbreak.

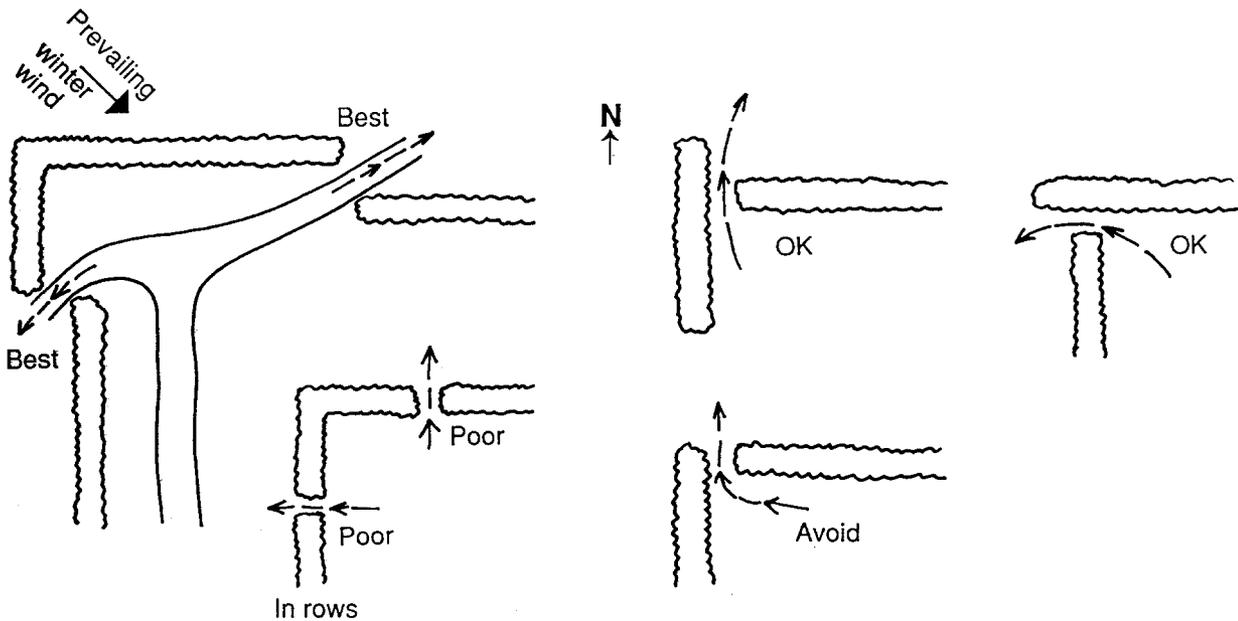


Figure 6. Traffic openings in tree windbreaks. Arrange openings to prevent winter windtunneling. Move opening away from corner if possible, and offset rows as shown at left.

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