Farmstead Windbreaks

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WOODLAND MANAGEMENT resources

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With proper planting and care, farmstead windbreaks are a valuable tool in woodland management. This publication lists the benefits of windbreaks and the proper steps to be taken in windbreak establishment. It also lists sources and recommended species of evergreen stock. For further information, check the section on related publications.

Benefits
Evergreen windbreaks will stop 50 to 75 percent of the winter wind around Indiana farms. As the clearing of forest land continues, particularly in more level areas, farms without windbreaks will suffer accordingly. Those with windbreak protection will benefit more each year as the trees grow.

Windbreaks can be the difference between the presence or absence of wildlife in the windswept sections of the state where little winter cover is available. Quail, pheasant, songbirds, rabbit, and other species of wildlife will use them as shelter from inclement weather, and as travel lanes, nesting and escape cover. If shrubs are used as a part of the windbreak, they will also provide food for wildlife.

Other benefits include reduced farm home heating costs and the protection of livestock feed lots and other buildings from the wind. The evergreen windbreak also provides an attractive background for the farm home and buildings, making it a more pleasant place to live. Landscape architects recommend windbreaks, and many farmers have found that their farmsteads are much more valuable as a result of windbreak plantings.

Location
Early planning is important so trees can be ordered on time. Also, fences must be arranged and soils must be prepared prior to planting. Establish the windbreak north and west of the area to be protected. For maximum benefits, plant the trees 150 to 200 feet from the center of the building group. On level areas, the first row of trees should be at least 80 feet from the nearest building or drive for protection from drifting snow.

Although many windbreaks are L shaped, a curved windbreak on the contour may be easier to cultivate and more attractive. Access roads or lanes should angle or curve rather than go straight through the barrier. In planning the windbreak, be sure to avoid or divert barnyard drainage, since this can be toxic to evergreens.

Preparation of the Planting Area
Proper preparation of the planting site is important for good tree survival and growth. Except on light sandy soils where weeds and sod are not a problem, control of competing vegetation should begin during the fall prior to spring planting. Sod and heavy weed cover should be reduced by plowing and leaving the area fallow over winter. Prior to spring planting, the soil should be disked and harrowed. Where plowing is not feasible, herbicides may be applied in the fall or spring in strips four feet wide to control grasses and weeds in the row. (Herbicide recommendations are given in Purdue University Extension Publication ID-1, “Weeding With Chemicals.”)
Spacing of Trees

At least three rows of trees are needed for an effective windbreak. The trees should be staggered in adjacent rows to give increased space for growth and development. See Figure 1.

![Figure 1. Alternate rows of trees should be staggered to provide increased space for growth and earlier wind protection.](image1.png)

On a 16-foot spacing, 30 trees for each 10 rods of length are required.

If extra rows of shrubs are used, they should be 10 to 12 feet from the evergreens and 4 to 6 feet apart in the rows. Shrubs, when used, should be on outside and/or inside rows. Keep all trees or shrubs at least 10 feet from fences.

Species to Use

White and red pine are good windbreak trees for planting throughout the state. Figure 2 illustrates usage of these two species. Norway Spruce is suitable for moist soils in central and northern Indiana. American arborvitae may also be used; however, it is frequently damaged by ice and snow. A mixture of species is a good safety factor. For landscape effect, a group mixture gives variation in color and form.

Table 1 suggests some species of broad-leaved shrubs which may be used on either side, or both sides of the windbreak to add beauty, utility, and wildlife benefits.

![Figure 2. A six-year-old windbreak includes two rows of white pine (left) and one row of red pine.](image2.png)

<table>
<thead>
<tr>
<th>Shrub</th>
<th>Expected maximum height (ft.)</th>
<th>Spacing in rows (ft.)</th>
<th>Age of stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highbush cranberry</td>
<td>12-15</td>
<td>4-6</td>
<td>1-0</td>
</tr>
<tr>
<td>Autumn olive</td>
<td>12-15</td>
<td>6-8</td>
<td>1-0</td>
</tr>
<tr>
<td>Grey dogwood</td>
<td>6-8</td>
<td>4-6</td>
<td>2-0</td>
</tr>
<tr>
<td>Red Osier dogwood</td>
<td>8-10</td>
<td>4-6</td>
<td>1-0</td>
</tr>
<tr>
<td>Arrowwood (Viburnum sp.)</td>
<td>8-10</td>
<td>4-6</td>
<td>1-0</td>
</tr>
</tbody>
</table>

Sources of Windbreak Planting Stock

Trees and shrubs adapted to Indiana are available from two state forest nurseries and a number of private nurseries. Order forms for state nursery stock and names of private nurseries are available from County Extension Offices and the Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907. Trees should be ordered early in the fall to get the proper species and sizes. A few extra trees should be ordered and planted nearby to replace those that die the first year. Coniferous planting stock should be 3 or 4 years old for farmstead windbreaks. Also, 2-1 or 2-2 transplants of good size and vigor are recommended for rapid uniform growth. The trees should be planted in early spring as soon as the soil can be worked. Fall planting is not recommended since “winter injury” and frost heaving cause many failures.

Tree Planting

When the trees arrive from the nursery, open the bundles and wet the roots and packing moss. If the trees will be planted within a few days, they may be
kept in the bundles in a cool place protected from freezing. If planting must be delayed for a long period, the trees should be “heeled-in.” Dig a trench in a shady location and spread the trees along the trench in a thin layer. Cover the roots with moist soil, refilling the trench, and pack firmly to eliminate air pockets.

When ready to plant the windbreak, place the trees in a bucket of wet packing moss to keep the roots moist. (Keep the roots wet until the tree is planted.) Take one tree from the bucket at a time after the hole is dug. Be sure the hole is deep enough to accommodate the roots in their natural position. Hold the tree at the same height at which it grew in the nursery; spread the roots in their natural position, and pack moist soil firmly around the roots. (Additional information on planting methods and tools is given in Purdue Extension publication FNR-36, “Planting Forest Trees and Shrubs in Indiana.”)

Fertilization is not recommended for the first year or two while the roots are getting established. During this period, emphasis should be placed on weed control. After two or three years, a spring application of 4 ounces of 12-12-12 or similar complete fertilizer may be placed on the ground around broadleaved plants, avoiding the stem by at least eight inches. Evergreens should not require fertilization for satisfactory growth.

**Protection**

Windbreaks and other forest plantings must be protected from all types of livestock. Grazing results in browsing or destruction of young trees and in older plantings, breakage of lower branches and early mortality of many trees results.

Care must be given to protection from fire. Weed control will reduce the fire hazard; however, trash should never be burned near the trees. When weeds and grasses are mowed, care must be taken to prevent injury of small trees.

Trees should be inspected frequently during the growing season for injurious insects. Unknown insects should be reported to the County Extension Office for identification and proper control measures.

Newly planted trees are susceptible to damage by rabbits and other rodents during the winter when food supplies are scarce. Wire screens and tree wrapping materials give good protection.

**Weed and Brush Control**

Weeds, grasses, and woody plants should be controlled within 2 or 3 feet of the newly planted trees. Sod or weeds may kill the young trees by competing for moisture in dry summer months. Control competing vegetation by shallow cultivation or by use of herbicides.

**Irrigation**

During dry seasons, it may be necessary to water newly planted trees. Watering should not be delayed until the trees begin to die. Frequent examination of soil moisture will help determine when water is needed. Late fall watering in dry seasons will help reduce the browning or burning of needles during the winter.

Mulches help hold soil moisture and reduce weed growth; however, they may attract rabbits and field mice, resulting in damage or mortality to trees.

**Shearing and Thinning**

New growth on the pines may be sheared to help form more compact and better-shaped trees. The time to shear pines is between the time the new leader completes its growth and before it hardens, a period of about three weeks. This period usually begins about the first of June in southern Indiana and two to three weeks later in northern counties. Multiple leaders should be pruned out, leaving one vigorous terminal near the center. Terminals should be clipped back to the desired length, 12-14 inches is suggested, and the laterals should be sheared sufficiently to give a well-balanced and symmetrical form. Hedge shears or shearing knives may be used.

As the trees increase in size, periodic light thinnings may be needed to provide additional growing space for the lower branches. In making thinnings, alternate trees, interior rows, and poorly formed trees may be removed. If a crowded windbreak is not thinned, the lower branches will die decreasing the density of the barrier. Shrubs that grow tall and spindly after several years should be cut back severely to promote sprouting and denser foliage near the ground.

**Related Publications**

For further information, contact your County Extension Office, or the Publications Mailing Room, 301 S. 2nd Street, Lafayette, Indiana 47905.

FNR-36  Planting Forest Trees and Shrubs in Indiana E-32  How to Combat Insect Pests of Pine Trees ID-1  Weeding with Chemicals
Schematic drawing of an exposed farmstead facing south, showing the building group before the windbreak and landscaping was accomplished and a view of the farmstead several years after planting of the windbreak and landscaping. Such a windbreak can add much to the comfort and satisfaction of farm living.