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Windbreak Management To Reduce Overwintering Boll Weevil Habitat



Texas Agricultural Extension Service
The Texas A&M University System
College Station, Texas

Windbreak Management to Reduce Overwintering Boll Weevil Habitat

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The boll weevil overwinters in broadleaf litter which accumulates beneath trees, shrubs and evergreens. If the windbreak design is planned carefully, the buildup of leaf litter can be minimized, thus depriving boll weevils of a good place to pass the winter.

Each fall boll weevils leave cotton to seek shelter for the winter. One of the best overwintering sites for the boll weevil is in areas such as windbreaks where broadleaf litter has accumulated over a period of years. Broadleaf litter 0.5 to 3 inches deep provides the protection required for boll weevils to overwinter in the Texas Rolling Plains.

Windbreaks planted in the Rolling Plains from 1935-42 provided high quality boll weevil overwintering habitat by 1950, and these plantings were one of the major factors allowing the boll weevil to survive in damaging numbers. In years of heavy uncontrolled infestations, the boll weevils that overwinter in 1.5 acres of broadleaf windbreak litter can infest about 32.5 acres of cotton by mid-August. These boll weevils can cause a reduction of about 110 pounds of lint per acre, or a loss on the 32.5 acres of 3,575 pounds of lint, which equals a dollar loss of \$1,966.25 at 55¢ per pound of lint.

Since 1942 Great Plains foresters have significantly modified windbreaks from 10 to 20 row plantings to 2 or 3 row plantings. The narrower windbreaks require considerably less land and are nearly as effective. They also provide less habitat for overwintering boll weevils.

A single row of trees can create gaps; the loss of several consecutive trees can seriously impair the windbarrier. Two rows of conifers are usually recommended to provide a windbreak of effective density and height.

Boll weevils can overwinter in as little as 0.5 inches of accumulated broadleaf litter. Evergreens often capture and hold broadleaf litter under the lower branches, thus providing a winter habitat for boll weevils. To keep boll weevils from overwintering in a windbreak all broadleaf litter must be destroyed.

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To maintain a litter-free windbreak, follow these practices:

1. Space trees far enough apart so that a tractor and disk can be used to destroy litter.
2. Trim interior limbs of the windbreak to allow passage of equipment.
3. Prune lower exterior limbs of trees on the outside rows high enough to prevent trapping leaf litter.
4. Choose trees that will not provide a layer of litter for overwintering boll weevils.

Weeds and accumulated litter in the rows and between rows should be destroyed each spring and fall by disking. This will eliminate weed competition with the trees and will reduce subsequent weed crops as well as increase the moisture storage.

Plant trees far enough apart so that a tractor and a disk can be used to destroy litter. The spacing between rows should be at least 20 feet and 4 feet wider than the implement used for cultivation. Do not plow over 4 inches deep to prevent root pruning.

In-row spacing will vary with the plant selection. Recommended spacing for the common species planted in windbreaks is given in Table 1.

Table 1. Recommended Spacing for Windbreak Trees

Species	Spacing (feet)
Conifers	
Afghanistan pine (<i>Pinus eldarica</i>)	8-12
Eastern redceder (<i>Juniperus virginiana</i>)	12-14
Rocky Mountain juniper (<i>Juniperus scopulorum</i>)	12-14
Austrian pine (<i>Pinus nigra</i>)	14-16
Ponderosa pine (<i>Pinus ponderosa</i>)	14-16
Arizona cypress (<i>Cupressus arizonica</i>)	15-18
Deciduous	
<i>Short to Medium</i>	
Desertwillow (<i>Chilopsis linearis</i>)	10-12
Russian olive (<i>Elaeagnus angustifolia</i>)	10-12
Osage orange (<i>Maclura pomifera</i>)	12-14
Hackberry (<i>Celtis occidentalis</i>)	14-16
Mulberry (<i>Morus</i> spp.)	14-16
<i>Tall</i>	
Bur oak (<i>Quercus macrocarpa</i>)	14-16
Walnut (<i>Juglans</i> spp.)	14-16
Green ash (<i>Fraxinus pennsylvanica</i>)	14-16
Honeylocust (<i>Gleditsia triacanthos</i>)	14-16
Siberian elm (<i>Ulmus pumila</i>)	14-16
Pecan (<i>Carya illinoensis</i>)	16-20

Wider spacing is best for multiple-row windbreaks. Where plants are too close to allow disking, litter will have to be raked from under the tree row before disking. This will greatly increase the hand labor required. Information on species selection, spacing and design of windbreak plantings is contained in Circular 234 "Windbreak Planting Guide," available from the Texas Forest Service.

Interior limbs should be pruned high enough so all disking equipment can pass easily under them (Figure 1). Do not prune exterior limbs except those that touch the ground. If all limbs are pruned to a high level, the windbreak function of the tree rows will be eliminated.



Figure 1. Interior limbs of eastern redcedar and chinese elm have been trimmed to allow passage of equipment and lowest exterior limbs of eastern redcedar have been pruned to prevent accumulation of litter. Note the unpruned section of this windbreak in the background.

Prune exterior limbs carefully. Lower limbs that touch the ground on either side of the windbreak should be pruned so broadleaf litter is not trapped (Figure 2). Care should be taken to make sure that evergreens as well as broadleaf trees do not catch and hold leaves which will provide a suitable boll weevil winter habitat.

Choice of tree types influences suitability of litter habitat. Leaf litter deposited from evergreens (pine needles) is much less suitable for overwintering boll weevils than litter deposited by deciduous trees and shrubs. For example, with proper limb pruning, a two-row windbreak of redcedar and pine provides little suitable litter. However, the addition of a deciduous tree, such as green ash, increases the suitability of the litter layer if proper maintenance practices are not followed.

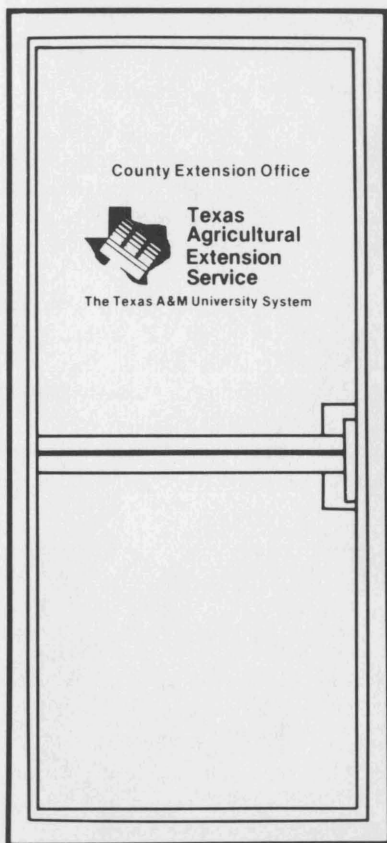
Windbreak plantings should be continually maintained to preserve tree vigor and to destroy litter accumulation to minimize the overwintering of boll weevils.



Figure 2. This is an undesirable situation under eastern redcedar because the unpruned lower limbs trap broad-leaf litter.

Funds for this publication were made available by the Rolling Plains Cotton Growers, Incorporated and the Plains Cotton Growers, Incorporated. The research on which this information is based was supported in part by Cotton Incorporated.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.