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# Preventing storm damage to deciduous trees

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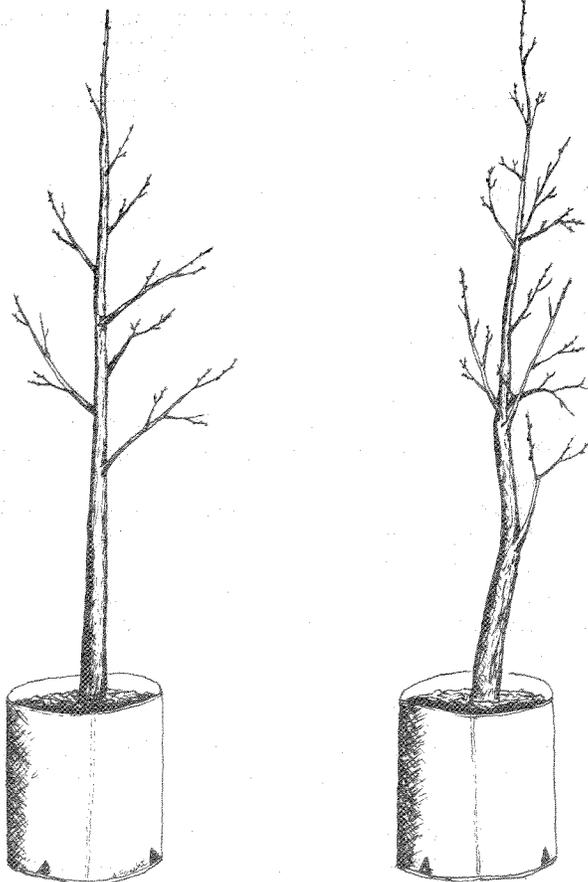


Figure 1: A tree selected from a nursery stock should have a straight trunk, evenly spaced branches and branches with a wide crotch angle, as on the left. Trees exhibiting features as shown on the right should be avoided.

Species with an upright, narrow growth habit, such as the Lombardy poplar, always will have narrow crotch angles.

Trees of medium or slow growth rates ultimately will be stronger. Rate of growth of any given tree usually is proportionate to its brittleness. Faster growing trees generally are more brittle than slower growing trees.

Almost everyone wants shade as rapidly as possible, but the homeowner must weigh the

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## Quick Facts

Storm damage to deciduous trees can be prevented by careful selection, training and pruning procedures.

Trees for initial plantings should be selected that have straight trunks, evenly spaced branches and wide crotches at unions of main scaffold branches.

Trees of medium or slower growth rates ultimately will be stronger and more damage resistant.

Bracing and cabling techniques can be used to help prevent or repair storm damage to trees.

Trees are a valuable asset to residential property. When properly maintained, trees appreciate rather than depreciate in value. One severe storm, however, can ruin or disfigure a tree permanently. Prevention of such damage depends on proper selection, training and pruning of trees.

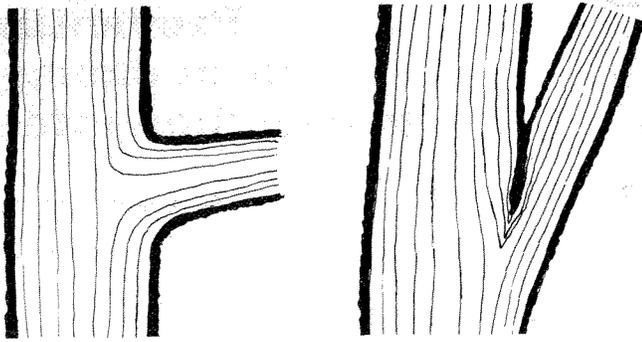
## Selection

Quality, not price, should determine selection of a tree for the home landscape. So-called "bargain" trees may be of a naturally brittle species or may be trained or pruned improperly. After a few years of growth, a "bargain" tree may sustain heavy storm damage or be totally destroyed because of its poor quality.

The following features are important in selecting a tree.

Straight-trunked trees with evenly spaced branches will be stronger and more damage resistant than others. Trees should be rejected if they have several branches originating from nearly the same point on the trunk. In such cases, union of the branches suffers severe damage during storms (see Figure 1).

Wide (right-angle) crotches of main scaffold branches (primary branches from main trunk) to the tree are another important feature. In general, the narrower the crotch, the weaker the union of branch to trunk. This feature will vary somewhat with the type of tree selected (see Figure 2).



**Figure 2:** A branch crotch at wide angle is strong (left); A narrow crotch angle (right) is weak because the main trunk and the branch grow against each other forming a bark pocket and a poor structural union.

advantages and disadvantages of growth rate before a fast-growing tree is selected.

Fast-growing species usually are the ones that sustain the severest damage in storms. These include Siberian (Chinese) elms, willows, soft or silver maples and some varieties of cottonwood (poplars).

Selecting a tree of medium growth rate often is the best compromise. Trees of a moderate growth rate include varieties of honeylocust, green ash and American linden.

Examples of slower growing trees are bur oak, Norway maple, littleleaf linden and Kentucky coffee-tree.

For more information on selecting trees for the home landscape, refer to Service in Action sheets 7.403 and 7.408.

### Training and Pruning

Proper training and pruning of a young tree can prevent storm damage to a considerable degree.

The main scaffold branches should be selected, choosing only those that are well spaced and have wide crotch angles. All others should be removed.

The tree should be shaped as it grows by pruning back the tips of some branches. It is suggested that pruning cuts be made either above a side bud or a side branch. Stubs should not remain from pruning. Other pruning suggestions appear in Service in Action sheet 7.207, *Pruning deciduous shade trees*.

### Bracing and Cabling

If the homeowner already has trees with narrow crotch angles, and from which removal of any branches would destroy the tree's shape, future damage at weak points still can be prevented by use of bracing and cabling techniques.

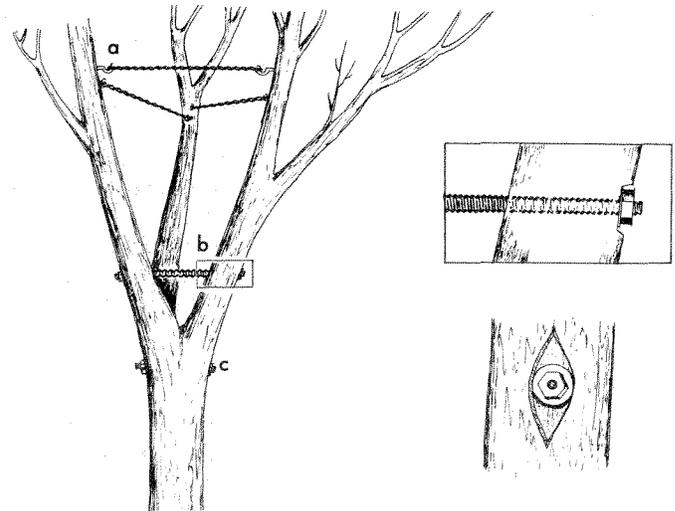
Support of permanent scaffold branches can be accomplished by installing permanent cables and inserting steel rods through the weak portion

or a crotch (see Figure 3, a and c). Installing cables and braces in small trees can be done by the homeowner; for larger trees, assistance of a professional arborist is recommended.

Cabling is a method of using a stronger branch, such as the main trunk, to support a weaker side branch that might break off under the weight of heavy snow. For any but temporary measures, hooks should be installed rather than wrapping a wire around the branches and trunk. Even though protected by a length of garden hose, the tree eventually will develop girdling where wires are wrapped around it.

Rigid braces and lip bolts may be desirable in some cases to prevent swaying of the crotches (see Figure 3, b). This is accomplished by drilling a hole through both branches to be braced, inserting a steel-threaded rod and bolting each end. Washers used must be countersunk below the bark.

Bracing and cabling techniques also can be applied to repair storm damage already sustained by a tree. If done promptly, repairs can help a tree heal and resume its normal growth and appearance.



**Figure 3:** Bracing and cabling a tree to prevent storm damage.

a) Cables are attached to lag threaded hooks to support upper branches. Cables should be installed 2/3 the distance between the crotch and top of the tree.

b) A rigid brace is installed in a narrow crotch. (See insert showing large cutaway view and face view.) Washers and nuts are countersunk by removing a piece of bark down to the wood, leaving the wound pointed top and bottom to promote better healing.

c) Lip bolting is used in cases where splitting may occur or to repair a trunk that is already split. Bolts are installed in the same manner as rigid braces.