Repairing Storm Damage to Trees
Michigan State University
Cooperative Extension Service
Melvin R. Koelling, Russell P. Kidd, Forestry Department
July 1980
4 pages

MICHIGAN STATE UNIVERSITY
CES
COOPERATIVE EXTENSION SERVICE

Repairing Storm Damage to Trees

Extension Bulletin E-1364, July 1980, FILE 24.54

Melvin R. Koelling and Russell P. Kidd
Forestry Department

Many shade and ornamental trees are damaged throughout the year by windstorms, ice and snow accumulations, lightning or other mechanical sources (automobiles, vandalism, etc.) (Fig. 1). Damage usually consists of a few broken branches. However, more severe damage such as splitting or pulling apart of branch forks, removal of large areas of bark, twisting and splitting of the trunk, or even uprooting may occur. These injuries usually result in a change in appearance of the tree and increase its susceptibility to a subsequent insect or disease attack. Thus, it is important that the damage be properly treated and repairs made to maintain the health of the tree. Some types of damage may be treated satisfactorily by the homeowner; others may require the services of a tree specialist, particularly if extensive bracing, cabling or the removal of large branches is required. This bulletin covers various types of storm and/or mechanical injuries and suggestions for treatment and repair.

Recognizing the Damage

Often, damage is relatively minor with only the smallest branches of the tree being injured. Usually, injury of this type results in little or no permanent damage to the tree. All that is required is clean-up of the broken twigs and branches and perhaps some light pruning to restore a pleasing shape. A few tree species including Chinese elm, silver maple, box-elder and various poplars have brittle wood which is easily broken. These rapid-growing trees are particularly susceptible to storm damage. Homeowners should be aware of these characteristics and avoid planting such species close to buildings, utility lines, etc. where potential damage could occur. If such trees are already growing in these locations, some preventive practices, such as pruning and bracing, or cabling, may help reduce the potential of storm damage. This is particularly true as the tree grows in size and the weight and surface of the leaf and branch area increases.

More severe damage consisting of large broken branches, split crotches and/or removal of bark, and splitting or splintering of the trunk can occur. Strong winds, lightning and heavy ice storms are the most probable causes. When a tree is severely

Figure 1. A heavy accumulation of ice from a late winter storm broke this main branch.

Figure 2. A tree which has sustained this amount of damage usually can't be saved. It would probably be best to cut the tree and replace with a new planting.

damaged, the first question that must be answered is: "Is the condition of the tree such to make keeping it worthwhile?" Take the time and effort to save a tree only if a substantial portion of the tree remains intact and if, when repairs are made, the tree will still be attractive and of value to the property owner (Fig. 2). This is particularly true if the tree has brittle wood and a branch structure which makes it vulnerable to additional damage from future storms. In addition to its condition, other factors to consider in determining whether or not a tree is worth saving include its age, species, growing location, the value it adds to the property, sentimental value, etc. When all of these are considered it may often be more desirable to replace the damaged tree than perform extensive repairs. If you are not sure, see a local

nurseryman, professional tree service company or consulting urban forester for assistance. If it is determined the tree is not worth saving, remove the tree as soon as possible.

Treating the Tree

Assuming the decision has been made to repair the tree, the next question is: "Am I capable of repairing the damage myself or should I seek professional help?" Major repair will undoubtedly require the use of a chain saw and climbing equipment. Unless one is experienced in the use of such equipment and comfortable working off the ground, it may be best to have the work performed by a competent professional. The names of qualified firms can be obtained from local nurserymen.

Once it has been determined that the tree can be salvaged, follow these procedures.

First of all, assess the damage. Some branches may be broken and hanging in the tree, others may be partially attached, and in some cases, entire forks may be split. Plan which branches must be removed and *where* the removal cut should be made. Remove all damaged branches at the nearest lateral branch, bud, or main stem and *not* in the middle of a branch (Fig. 3). Such careless pruning may result in death of the entire branch or in excessive sprouting and the eventual development of more problems later on, since these sprouts are generally short lived and weakly attached. (Fig. 4).

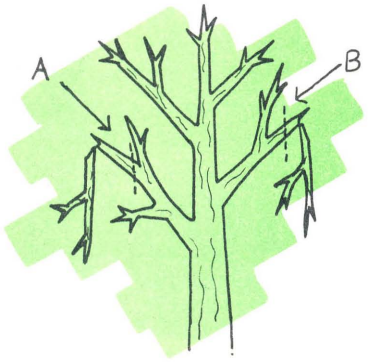

Figure 3. Cut broken branches adjacent to the next larger branch (A). If the cut is made immediately below the break (B), decay of the protruding stub is likely.

Branch Removal

Branches smaller than ¾ inch diameter can best be removed using a pruning shears or a pole-pruner. A sharp, properly aligned shears or pruner will make a clean cut, not crush or tear bark tissue and reduce clean-up time.

Use a sharp saw to remove larger branches. If a power saw is used, a safety rope and harness are essential. Be particularly careful when footing is unsure. At all times, use common sense and follow all recommended safety precautions when working with equipment in and around trees.

Figure 4. In some species, sprouts may develop from the end of a cut branch. Such growth is usually weakly attached and susceptible to breakage.

The most efficient and least damaging way to remove large branches without causing further damage to the tree is the 3-cut procedure (Fig. 5). The first cut is the undercut. From the underside, saw approximately 12 to 18 inches from the main stem or branch to which the damaged limb is attached. Cut into the branch about 1 to 1½ inches deep and withdraw the saw blade before it begins to bind. For the second cut, or over cut, saw approximately 2

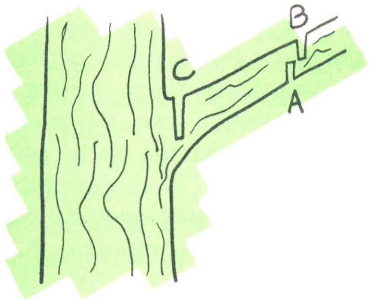

Figure 5. Remove larger branches using a 3-cut approach. Make the first cut (A) about ⅓ of the way through the branch. Follow with the overcut (B) which allows the branch to fall. The final cut (C) removes the branch flush with the main stem.

to 3 inches beyond the undercut and continue until the branch is removed. The final or flush cut is made to remove the remaining stub. Saw in the natural depression flush with the trunk or branch. This procedure reduces the likelihood of tearing bark on the undamaged portion of the tree.

A special word of caution: be aware of the location of overhead utility lines. If broken branches are touching utility wires, the homeowner should avoid removing these branches and notify the local utility company.

Torn Bark

In some instances, the tearing of bark on large limbs or the main trunk occurs. This is especially common when trees have been struck by lightning. Carefully trim away all loose bark back to the area

where it is solidly attached. A sharp knife or chisel can be used to cut the bark. Do not cut too deeply into the wood of the tree. This cutting of the bark is referred to as a bark tracing (Fig. 6). If possible, all bark wounds should be cut into an elliptical shape, being careful to keep the trace as narrow as possible. This may be difficult on large areas. However, trimming the bark in this manner will encourage rapid healing with minimal wood decay.

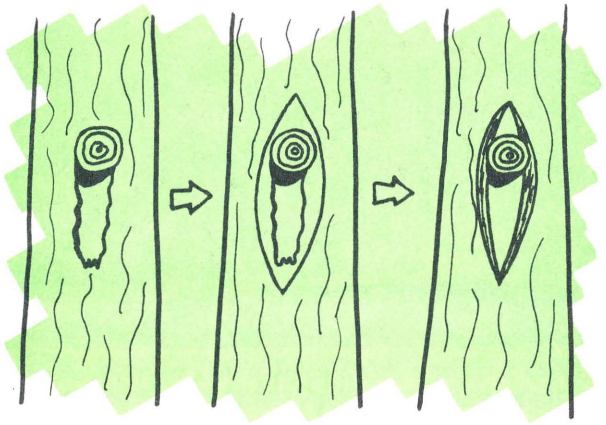

Figure 6. Treat all bark wounds to form a bark tracing. This encourages closing of the wound with minimal wood decay.

Split Forks

Some forks and main branches which are split apart or partially broken may be repaired without removing one or both branches. This type of work is usually beyond the capability of most homeowners unless they have experienced assistance. The following guidelines explain how it should be done.

If the break is nearly even, with adequate amounts of wood tissue on each portion, it is often possible to draw the split portions back together and secure them with a large diameter steel bolt or threaded screw rod placed through the split section (Fig. 7A). The first step in repairing a split or fork is to draw the split together using a small block and tackle or winch, more commonly referred to as a "come-a-long." Place this some 6 to 8 feet, or more above the split to obtain maximum leverage. Drill holes through both halves of the split in which the bolt or rod is inserted. With long split areas, 2 or more bolts may be necessary. In addition to the bolts, it often helps to install a steel cable between the two main branches of the split fork several feet above the split (Fig. 7B). Use lag screws to attach the cable to each branch. Do not wrap the cable around the branch or it may eventually girdle it. This cable system helps hold the crotch together, thus reducing the chance of further breakage.

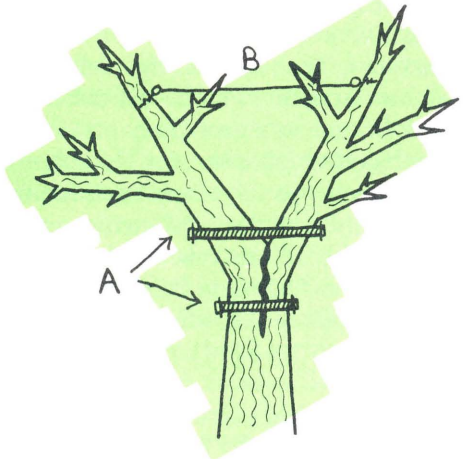

Figure 7. Install a steel bolt (A) through the split fork of a tree to help hold it together. Place a cable higher in the tree (B) between the same branches to reduce the likelihood of further breakage.

If the fork or main branch cannot be pulled together, remove it, (Fig. 8) using the 3-step method. If the break extends into the wood, remove loose, splintered fragments and shape the area as described for a bark tracing. Remove or shape any grooves or depressions in the damaged area so that water will not collect. If this is not done, the probability of decay is increased.

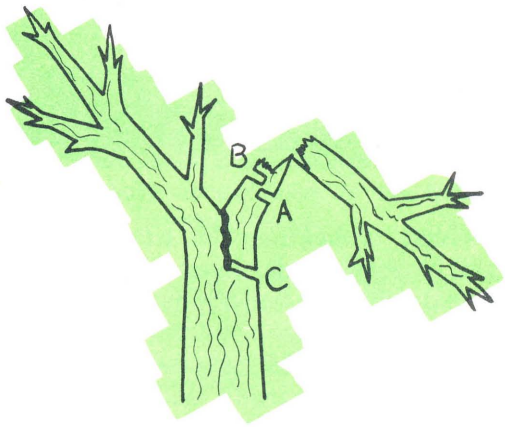

Figure 8. Remove a member of a split or broken fork which cannot be repaired using the 3-cut procedure.

Following the removal of all broken branches and stubs, and tracing of bark wounds, some additional pruning may be necessary to develop a balanced appearance and natural shape in the tree. Pruning should help compensate for the loss of other branches. While the overall size of the tree will usually be reduced, a symmetrical appearance can often be obtained.

Wound Treatments

After pruning is complete, all wounds larger than 1½ to 2 inches in diameter can be coated with a wound dressing or pruning paint, if desired. Recent research has shown that these dressings and paints probably do not increase the rate of healing. However, they may prevent drying out and provide some cosmetic effect. Several commercial materials are available or a couple of coats of orange shellac will

suffice. Areas of torn bark where tracings have been made can also be treated in this manner.

Uprooted Trees

Occasionally, trees may be uprooted as a result of severe storms. If the tree is large, it cannot be saved and therefore must be removed. For some smaller trees (25 feet or less in height), it may be possible to straighten the tree and brace it using guy wires or cables. Some type of power lift or equipment is usually necessary to pull the tree upright. Do not attempt this procedure unless ⅓ to ½ of the tree's roots are still in the soil and the remaining exposed roots are relatively compact and undisturbed.

Before the tree is pulled upright, remove some soil from beneath the root mass so the roots will be placed below the existing soil grade level. Once the tree is back in an upright position, fill in soil as needed. Water the tree to help firm the soil and remove air pockets. Attach 2 or 3 guy lines to the trunk as is often done for newly transplanted trees, at a point approximately two-thirds of the height of the tree and to anchors placed some 12 to 15 feet from the base of the tree (Fig. 9) to hold the tree in place. Turnbuckles can be used to tighten these wires.

Lightning

The effects of lightning on trees are variable. Some will be severely damaged with much splintering and shattering of wood and bark whereas others will suffer little or no apparent external injury. Lightning may kill trees immediately; others, even though damaged extensively, will continue to grow. Occasionally, trees will continue to appear normal immediately following the strike but may die several weeks or months later. This usually results from root injury which is not apparent.

Treatment of lightning-injured trees follows the same procedures as previously described. Remove broken branches, torn bark and splintered wood as recommended. Delay extensive repairs 6 to 12 months so the full damaged caused by lightning will be apparent. As a part of the treatment of damaged trees, or for trees which are vulnerable to lightning, it may be advisable to install a lightning rod protection system. Apply fertilizer to stimulate growth of trees injured by lightning.

Waste Disposal

Materials from fallen or salvaged trees can be used in several ways. The larger branches can be cut and used for firewood. Add smaller branches and twigs to the compost pile or cut up for kindling. Branches can also be converted into chips for use as a compost, mulch or other landscaping purposes if chipping equipment is available. In some areas, landfills or other waste disposal facilities are available to local residents.

Figure 9. Attach guy lines to newly transplanted trees or to those which have been righted following uprooting to keep the tree erect until the root system is re-established.

Tree Replacements and Additional Information

Following the cleanup and repair of storm-damaged trees, you may wish to make some new plantings. A few suggestions can help reduce future maintenance problems. First, make certain the tree being considered is hardy to the area. Then, consider the potential insect and/or disease problems which may be associated with a particular species. It is also helpful to know the approximate size and shape of the tree when mature. This will help determine where to plant it to minimize pruning due to interference with utility lines, branches rubbing against the house or other buildings, etc. Finally, consider characteristics of the tree other than the provision of shade, such as presence of spring flowers, attractiveness to birds, fall color and winter appearance. Through careful selection it is possible to obtain species which will contribute to the overall landscape in more than just one way. Several recommended species for Michigan and other information on the care and maintenance of trees can be found in the following extension bulletins. These publications can be obtained from any County Extension Office or the Michigan State University Bulletin Office, P.O. Box 231, E. Lansing, MI 48824.

E-710	*Selections of Shade and Flowering Trees for Michigan Landscapes (10 cents)*
E-786	*Fertilizing Shade and Ornamental Trees (15 cents)*
E-804	*Pruning Shade and Ornamental Trees (20 cents)*
E-914	*Plant a Tree (25 cents)*
E-1075	*How to Treat Wounds to Prevent Decay (5 cents)*
E-1076	*How to Keep Your Trees Healthy (5 cents)*

Cooperative Extension Service Programs are open to all without regard to race, color, or national origin. Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Gordon E. Guyer, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824. 2P-2.5M-7:80-UP, Price 25 cents.

MSU is an Affirmative Action/Equal Opportunity Institution Michigan State University Printing

O-12327