LARGE TREE CAVITY WORK AND CABLING

by W. Douglas Hamilton and Dick Marling[1]

Treatment of tree wounds is highly technical and requires constant study and observation.

Tracing a wound

Cleaning and professionally tracing the border of a trunk/limb wound is one of the first activities a tree worker will encounter. It is a prerequisite for cavity filling. Tracings must always, unless the wounds are very small, follow the direction of the sap flow. The first thing is to find the direction of sap flow in the cambial area, not the outer bark. The length of the wound has no bearing on how fast it will callus over, commonly referred to as healing. The shape of the tracing is not important as long as it follows the sap flow; experience mandates the maximum deviation is 15° from the sap-flow direction. When tracing a wound, it is important to not disturb any callus; trace only wood that has not healed. Are all trunk wounds of different tree species the same? Not at all, it varies even within a species.

Tree cavity work

It is expensive and if done properly, it takes time. So, before you start, look at tree value. The tree should have high vitality. It should be able to take cavity work and have the ability to callus-over quickly. If the tree doesn't measure up, the vitality must be raised before starting. Cavity work is rarely done on trees of less than 10 inches diameter and then only on the main parts of the trunk, or limbs more than 10" diameter. Soft wood trees should not be filled, with the exception of conifers.

To start, a "shiner" tracing is made around the cavity wound. This includes a very clean and smooth border around the cavity. Then the cavity is excavated and cleaned-out to sound and clean sapwood or heartwood. It is very important not to pressure the bark; it can pop loose easily and quickly. When cleaning out a cavity, start in the middle to avoid injuring bark and tender tissues beneath it.

If the cavity is to be filled, it must be drained and if excessive moisture is present, cleaned out. If necessary, a tight-fitting drain is installed upward into the base of the cavity. Conduit is preferred. If put in tight, wood fiber will expand around the pipe to exclude oxygen. The chance of decay is nil. Installing a drain relieves pressure, helps to dry out the cavity and helps the healing processes. Sometimes it pays to char the cavity surface with a blow torch. Sometimes a disinfectant such as Clorox or Lysol are applied. The cleaned cavity is then coated with one application of orange shellac to seal the surface from moisture. A wound dressing, such as asphalt emulsion, should then be applied.

The interior of deep dry cavities can be filled with almost any dry material that does not decay; bricks, old cement, rocks. The part of the cavity to be cemented nearer the bark must be of sound wood at least two inches deep and should be slightly wider on the inside; a keystone effect. Prior to cementing the cavity, putting in a few nails half way helps secure the cement. The kind of nails is not important and they can be put into the

[1] This article was written by University of California, Cooperative Extension Horticulture Advisor, Doug Hamilton from a talk by Dick Marling at the November meeting of the Bay Area Landscape Supervisors' Forum. Dick reviewed this article for accuracy. Dick Marling is a recognized authority in tree work. He was with the Davey Tree Surgery Company, Ltd. for 19.5 years, was peninsula district representative and in charge of the research and training grounds for the company. He is now landscape resources supervisor for the City of San Mateo. He is active in several tree related organizations and in the last seven years, has developed the arboriculture program for the college of San Mateo. He now teaches that course.

sapwood. Tree rods are sometimes installed in large cavities to minimize trunk cavity movement.

There is nothing special about the kind of cement for the filling. Three parts of sharp sand to one part cement mixed with just enough water so it will hold together in your hand is the right consistency.

The filling is started at the base; be sure to pack it tightly. The filling is not one continuous sheet, but is in small blocks not more than four to six inches high and separated by a layer of heavy-duty tar paper. It must be remembered that there is continued movement in tree trunks, more so in high winds, and tremendous pressures develop. Therefore, the small cavity fill units must have some allowance for stresses without cracking or breaking and allowing water and air to enter. The cement fill must be applied smoothly to the cavity edge and level with the sapwood. Make sure there are no sharp points in the cement filling; they break out easily. Horizontal stress marks, often are seen on the outside bark of older trees, are good indicators of where to place expansion joints. On large cavities, the cement filling will have vertical expansion joints as well as horizontal joints. These should never be in a straight line, but always staggered, pyramid style. Bevel the cement at the expansion joints for a finished look. When through, the outside should be given a coat of orange shellac and a week later, the surface should be painted to give the job a professional look.

Some foam materials have recently been advocated for filling cavities. Several reports indicate they have not held up.

The keys to lasting success of a cavity filling job is to clean and dry out a cavity before filling, properly fill the cavity to prevent the entrance of moisture and decay organisms and encourage tree vigor for a fast callus heal.

Tree cabling

Cables should be placed as high in the tree as the worker can safely place them. First, however, see if there is another way to solve the problem without cabling. Cabling weakens the tree because the tree tends to depend on them for strength. It is necessary for trees to move; when they do, small stresses develop. These are irritations and when live tissues are irritated, more cells and tissues develop.

Before cabling, the tree should receive corrective pruning; get the weight off the branch ends and balance the tree. Cables should be put in taut, not tight. A block and tackle is useful on many jobs to start a cable operation. The first lag eye or hook for cabling should be put in perpendicular (90°) to the branch and in a branch of approximately four inches diameter. Put the lag bolt in all the way up to the edge of the thread. Use the size of the lag bolt commensurate with the size of the limb. When installing a lag bolt, tighten it the full distance without stopping. If you stop, wood fibers will often tighten the bolt so that it cannot be moved. The bolts should always be in direct line to the cables; a bent bolt is a weakened bolt. And never tie more than one cable to an eye or hook. Each should be separated by more than four to six inches. How deep should lag bolts be inserted? About two-thirds the diameter of the limb and always into sound wood.

The purpose of the cable is to help the tree, not support it. When viewing the cabled tree from above, the cable system should appear in the form of a box or series of triangles. The purpose is to provide a system that allows the whole tree to move together.

How long should a cable system last? No system should remain longer than ten years without removal or replacement. If still needed, move it up to where it belongs.

Cabling is often used to alleviate a "splitty" crotch. Wood screws are also often used in these situations. By all means, however, help the tree to solve its own problem through pruning and increasing vitality.

A "splitty" crotch of some age will have built up a slight buttress growth on either side of the split, the tree's reaction to irritated tissues. If the split has opened, it should be cleaned. It may have to be disinfected and a drain may be necessary. It also may help to put in a 1/16" tracing as an irritation and stimulation to knitting tissues across the split. One to several bolts (wood screws) are required in such situations. They should be put in perpendicular to the split and at the point of the split, not above it. If more than one wood screw is used, they should be all put in from the same side (the high vitality side) and not more than one foot apart vertically on the trunk. If necessary, tree rods can be put through the weakened crotch; the tree can still flex and they are very strong. Once in, forget about it.

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Contributed Abstract

A comparison of dichlobenil four per cent granular and dichlobenil fifty per cent wettable plus a polymer extender for use as a fall applied perennial weed herbicide by W.D. Richards, Research Supervisor, Pacific Coast Nursery Inc., Route 1, Box 320, Portland, Oregon 97231.

A trial was established at Pacific Coast Nursery Inc., Sauvie Island, on 4 deciduous tree varieties to determine the comparative effectiveness of 1 herbicide in 2 different formulations. The first formulation was a 4 per cent ai granular material and was applied alone. The second formulation was a 50 per cent ai wettable material and was applied in conjunction with a polymer extender at a 1 to 1 ratio. All 4 of the shade tree varieties were grown in the field from seed and were transplanted in the test area on May 11, 1979. These plants were white birch, cockspur hawthorn, littleleaf linden, and thornless honeylocust. The trees were planted in commercial rows 4 feet apart on a 1 foot spacing and the treatments were applied in an 18 inch by 12 foot plot and were replicated 3 times for each variety. The herbicides applied to each variety were dichlobenil 4G at 3.75 lb ai/A and diclobenil 50W at 5 lb ai/A plus polymer extender in a 1 to 1 ratio. The treatments were applied on October 23, 1979.

Initial observations on weed control and crop tolerance were taken on December 20, 1979 with 2 subsequent checks made on February 25, 1980 and April 13, 1980. The plots were given a visual rating from 0 to 10 for weed control and crop tolerance. The weeds observed were annual bluegrass, chickweed, dandelion, foxtail, common lambsquarters, mustard, redroot pigweed, wild raddish, shepardspurse, and bull thistle.

The dichlobenil 4G proved to give only slightly better weed control than the dichlobenil 50W plus polymer extender and neither material caused any significant economic loss from crop tolerance. The materials should be compared in terms of cost and ease of application by the user.

Treatment	*Rate*	*birch*	*(test only)* *hawthorn*	*linden*	*locust*
dichlobenil 4G	3.75 lb ai/A				
broadleaf control		10	9.1	10	9.1
grass control		9.7	9.8	10	9.8
crop tolerance		1.3	2.0	2.1	1.7
check	0				
broadleaf control		5.1	3.5	4.3	3.1
grass control		2.0	3.3	4.1	5.1
crop tolerance		0	0	1.0	1.0
dichlobenil 50W plus	5 lb ai/A				
polymer extender	5 lb ai/A				
broadleaf control		10	9.5	9.5	8.5
grass control		9.5	9.1	9.0	8.5
crop tolerance		2.7	2.4	3.1	2.1

Control and crop tolerance are an average taken from 3 rating dates with 10 = total control or total crop kill.