

Bridge Grafting in Bonsai

By Randy Bennett

The focus of this article is to explain bridge grafting and its' application in bonsai. Bridge grafting is a topic that is not often discussed in bonsai circles simply because the need to use it does not frequently occur. It is a technique that is typically used on large, collected trees which have been stump-cut. The case in point is a bald cypress.

I recently visited Jim Osborne at his home and after solving all the worlds' problems, we started talking about bonsai. Actually, we talked about bonsai and then solved all the worlds' problems. After all, you have to establish priorities. Anyway, at one point, we were talking about a large bald cypress that I helped Jim collect last year.

Although I didn't measure the base, I would estimate it at about 12 to 14 inches across. After collecting the piece, we took it to my house and used a chainsaw to cut the root base flat. Bald cypress collected from the swamp have a copious number of small roots growing close to the trunk, which makes that type of cut possible without any fear that the tree will survive the procedure. Jim planted the stump in a 36 inch Mica pot and allowed it to grow freely during the 2020 growing season.

Our discussion on this tree centered around next steps in the design process. Jim's plan is to develop the tree into a traditional formal upright bonsai, creating taper by allowing a new apical shoot to grow freely for the next couple of years, cut it back and repeat that process until good taper is achieved. His plan will put the finished height at about 48 inches. Among the growth patterns of bald cypress, this design is referred to as an "Immature Blunt and Fluted Variant". This will be a very powerful-looking bonsai in about five or six years.



The photo above is a bald cypress from Weigert's Nursery trained in the Immature Blunt and Fluted Variant Design

This year, Jim's plan is to select the primary branches from which he will develop the structure of the tree. By allowing the tree to grow freely last year, he has plenty of branches from which to choose.

Once he makes his selections, his plan is to remove all the remaining branches and force this year's growth into the primary branches and the new apex. One of the more important tasks he will focus on this year is the pruning back of all the branches below the apical shoot with the exception of the first, second and third primary branches.

The reason for this is that bald cypress, being a top-dominant species, sends its energy and growth to the topmost portion of the tree. This causes the upper branches to grow and thicken quickly at the expense of the lower branches. And to create a believable design, he will need the lowest branch to be the thickest with all other primary branches gradually decreasing in thickness as one visually ascends the tree to the apex.

When collecting such a large stump-cut tree, you are often going to have a rather large cut to try and overcome in the years ahead. On Jim's tree, that cut is about three inches across and about six inches high. The callous tissue was already rolling nicely across the cut and will take three to four years to completely cover the wound.



Guy Guidry and his stump cut bald cypress "Twister" styled in the 'Immature Blunt and Fluted Variant' design.

Usually, hiding cut scars is not difficult. They are usually manageable in size and are on the back of the tree. However, when they are large it becomes a bigger problem. The biggest being that callous tissue has no adventitious buds and therefore, no ability to have a branch in that area. This can create a 'bald spot' in the design of the tree and it becomes a feature that is more difficult to hide or disguise. This prompted a discussion between Jim and I on bridge grafting and the possibility of using that technique on his tree. And since I don't recall anyone ever writing about bridge grafting in the newsletter, I thought it might be a worthy topic to share with everyone.

Bridge grafting was developed by arborists and tree surgeons as a means to save trees whose trunks had been badly damaged – most typically on fruit trees whose trunks get damaged by mice during the winter months.



The photo above shows a newly applied bridge graft to help save a historic tree.

The typical bridge graft involves cutting wedges in the living portions of the bark above and below the damaged portion on the trunk of the tree and aligning the cambium tissue between the tree and scion(s) that form a 'bridge' between the two living portions of the trunk. The areas are then sealed to keep out air and moisture. Once the scions have successfully been grafted to the trunk, vascular tissue and the flow of water and nutrients can be restored to the areas below and above the damaged area. This maintains the health of the roots on the damaged side and prevents the dead portion from spreading and eventually killing the tree.

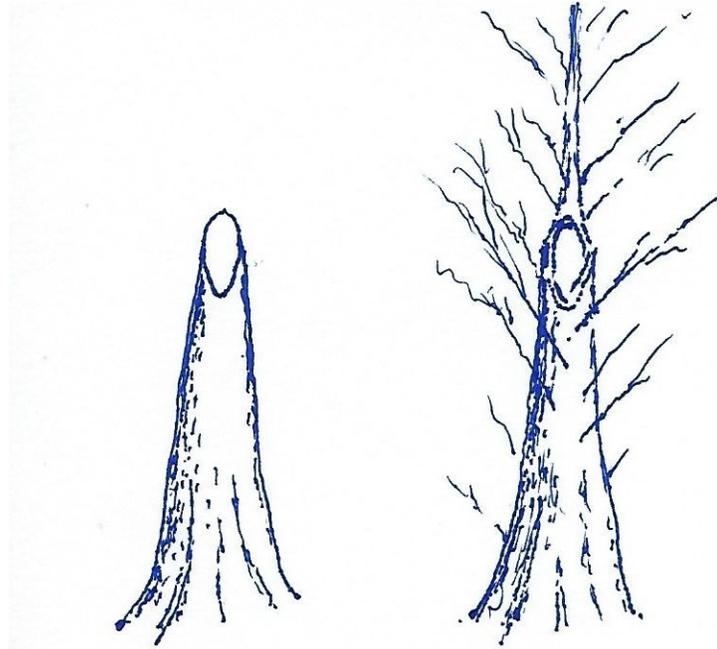
The photo below shows a tree that was saved by successfully using bridge grafts to restore the damaged trunk.



A similar application can be used in bonsai but for a completely different purpose. For our application the bridge graft will actually be a cross between a bridge graft and an inarch graft for the sole purpose of having a branch or branches where there would normally only be callous tissue. Moreover, this technique is simple and easy to implement – even for individuals with little or no experience with grafting.

Cutting scions and successfully aligning the cambium tissue to the stock tree is both daunting and unnecessary for our purposes. And the average bonsai enthusiast would have many more failures than successes. The easiest and sure-fire method is as follows:

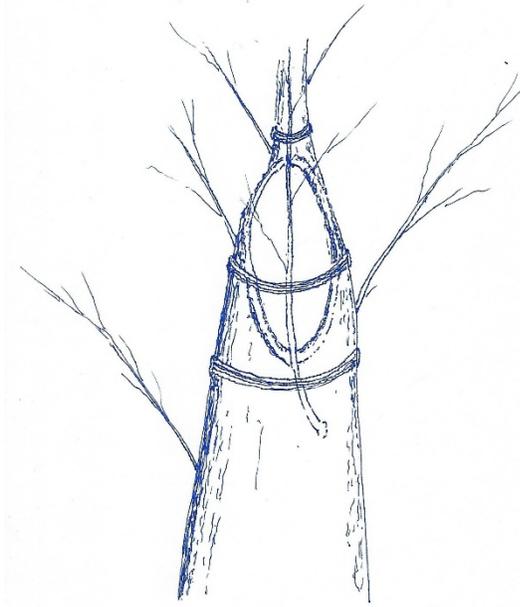
1. You need to have at least a years' growth of callous tissue along the edges of the cut.
2. At the end of January, after the first full growing season, you need a nearby young shoot that is flexible and about a foot in length or longer, depending on the size of the wound. The shoot needs to be long enough to ensure that there are several inches that will extend above the top edge of the callous tissue.



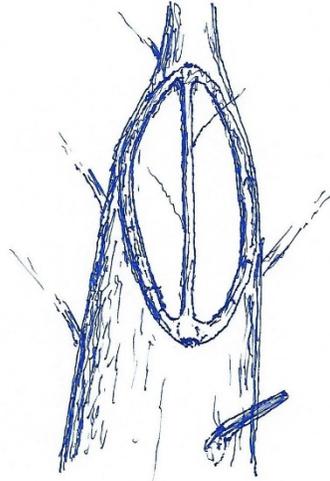
Newly collected cypress stump

After one year of growth

3. Cut a groove in the callous tissue at the very bottom and top of the cut. Make sure that the groove is not too big. The live shoot, that is still attached to the tree, needs to fit snugly into the groove, both at the bottom and the top. In addition, you need to ensure that the shoot is able to be embedded fully into the groove.
4. Place the shoot in the bottom groove first and secure it below the groove using raffia or grafting tape. This is to prevent the shoot from moving.
5. Next, place the shoot in the top groove and secure it both below and above the groove with more raffia or tape.
6. Make sure that there are several inches of the shoot extending up above the top edge of the callous tissue.
7. Seal the two areas with cut paste to keep out air and moisture.



8. In spring the shoot will sprout along with all the other shoots. Because it is near the cut and being grafted vertically, it will grow vigorously.
9. When you see swelling in the areas where the two grafts were created, you can be certain that the grafts have taken. This will usually occur during a single growing season with bald cypress, since shoots will typically grow several feet a year when allowed to grow freely.
10. During late January, after the second season of growth, the shoot that was grafted and has now formed a 'bridge' between the top and bottom of the callous tissue, can now be separated from the 'bridge'.
11. Remove that part of the shoot that extends above the top of the callous tissue along with that part of the shoot that extends below the bottom at the lowest portion of the callous tissue.
12. The shoot that was used to create the bridge graft can now be wired and used in the design or removed if not needed; now that it has served its purpose.
13. The portion of the shoot that is now grafted to the top and bottom of the callous tissue has many buds that can be used to form one or more branches where before, only callous tissue would be. In fact, knowing bald cypress, you may already have young branch shoots that have formed along the graft.
14. The bridge graft will eventually be incorporated into the callous tissue as the wound heals during the next few years, but you will now have a branch or branches where none would have existed.



While I have described this technique using bald cypress, it can just as easily be applied to any species that forms thick callous tissue.

This technique is not one that you will use very often, but it is always good to have as many tools in your toolbox as possible, since you never know when you have need of them. Having the right tool for the right situation is always best.