TREE-RING RESEARCH, *Vol. 63(1), 2007, pp. 61–62*

TECHNICAL REPORT

A MODIFIED INCREMENT BORER HANDLE FOR CORING IN LOCATIONS WITH OBSTRUCTIONS

PETER M. BROWN*

Rocky Mountain Tree-Ring Research, Inc.
2901 Moore Lane
Fort Collins, CO 80526, USA

ABSTRACT

A simple modification to a standard increment borer handle is described that enhances use of the borer in situations where obstructions to the rotation of a normal handle prevents utilization of the full length of the borer. The modification, informally called the ''Quad-B'' (Brown's bent boomerang borer handle), involves bending both sides of the handle to ~35–40° angles. Some potential uses of the modified handle are described.

Keywords: Tree rings, coring, sampling.

INTRODUCTION

Regular increment borer handles are often less than ideal for obtaining cores in situations where the handle runs into obstructions that restrict utilization of the full length of the borer itself. These situations include trees with branches at the coring location, trees with thick, furrowed bark that limits borer penetration, coring close to the ground for age structure studies or, most commonly, when the borer is not exactly perpendicular to the tree and the handle runs into the bole. Here I describe a simple modification to a borer handle that permits greater use of a borer in situations where one may encounter obstructions. The modification has been informally referred to as the ''Quad-B'', for Brown's bent boomerang borer handle (Figure 1).

THE MODIFICATION

The modification works best on longer handles from 40- to 50-cm borers. The modification starts by putting 2 to 3 crimps with a cold chisel and hammer in the retention clip side of the handle approximately 1 cm distal from the reinforced center of the borer (Figure 1). The crimps are necessary to weaken the steel for the handle to be bent properly. Make sure the borer clip is pointing up before hammering in the crimps. Bend the handle to a ~35–40° angle by mounting the handle in a vise and using a ''cheater bar'' (an 80- to 100-cm length of metal pipe with a diameter just large enough to fit the handle) to provide sufficient leverage. When bending the bar, again make sure the clip is pointing up and slip the cheater bar down to the crimps before bending. Once the first side is done, turn the handle around in the vise to repeat the process on the other side. More than one bend may be needed on each side to get the angles equal.

Once the handle is bent, the question arises as to where to store the borer and extractor. Options are to bend an old handle from which the borer has been broken or lost, to buy a new handle without the borer and extractor, or to create a new storage tube for your borer and extractor. To make new storage tubes for either 4.3-mm of 5.1-mm diameter borers, I use the appropriate length of ½-inch (1.27 cm) PVC pipe. I first pop the rubber end-cap out of the old handle for the stopper end of the PVC pipe (this can be glued to assure it

*Corresponding author: pmb@rmtrr.org

Copyright © 2007 by the Tree-Ring Society

Figure 1. Left: the quad-B. Right: closeup of crimps next to the clip.

does not come out), then tap threads into the other end to receive the extractor (a regular ½-inch (1.27 cm) wide-thread tap works well). A modified borer handle can easily be carried in the field in addition to regular borer handles to allow for greater range of use of the borers when coring.

THE QUAD-B IN USE

Originally the Quad-B handle was designed for coring giant sequoia (*Sequoiadendron giganteum*) trees (Brown et al. 1992; Hughes and Brown 1992). Giant sequoia trees often have extremely thick bark (up to 30 to 40 cm) that contains deep furrows that reach almost to the phloem and provide suitable locations for coring. The Quad-B was designed such that we could core in the furrows to obtain longer cores than those we could obtain with regular handles that run into the bark on either side of the furrows. The Quad-B also has proven extremely useful for coring trees such as piñon pine (*Pinus edulis* or *P. monophylla*) or juniper (*Juniperus* spp.) in woodlands of the southwestern US. These ''pygmy'' trees often have branches that extend to the ground, and finding a suitable location to core without obstructing branches is often difficult. Current use for the Quad-B includes coring for studies reconstructing chronologies of tree recruitment (Brown and Wu 2005; Brown 2006). For these studies, we core trees at 10-cm height above what we estimate to be root-shoot boundaries to obtain more precise estimates of tree recruitment dates than if we cored higher on the stem. Regular borer handles are problematic as they run into the ground when coring this low on the stem.

In my experience, only one Quad-B handle has broken in the over 15 years since we started using them, although the modification does weaken the handle at the bend points. It is advisable to have a backup handle (regular and/or Quad-B) in case one breaks in the field.

REFERENCES CITED

Brown, P. M., 2006. Climate effects on fire regimes and tree recruitment in Black Hills ponderosa pine forests. *Ecology* 87:2500–2510.

Brown, P. M., M. K. Hughes, C. H. Baisan, T. W. Swetnam, and A. C. Caprio, 1992. Giant sequoia ring-width chronologies from the central Sierra Nevada, California. *Tree-Ring Bulletin* 52:1–14.

Brown, P. M., and R. Wu, 2005. Climate and disturbance forcing of episodic tree recruitment in a southwestern ponderosa pine forest. *Ecology* 86:3030–3038.

Hughes, M. K., and P. M. Brown, 1992. Drought frequency in central California since 101 B.C. recorded in giant sequoia tree rings. *Climate Dynamics* 6:161–167.

Received 4 December 2006; accepted 2 April 2007.