

A Technique for the Introduction Of Radioactive Solutions into Woody Stems of Trees and Shrubs

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In the course of working out the details of an experiment involving the introduction of radioactive nutrient solutions into fruit and nut trees, a technique was devised which was found to be effective and safe when used on young trees actually growing in the nursery or orchard. (See Illustration 1.) This normal site situation is more conducive to the attainment of usable data than that obtained in a greenhouse environment, for example.

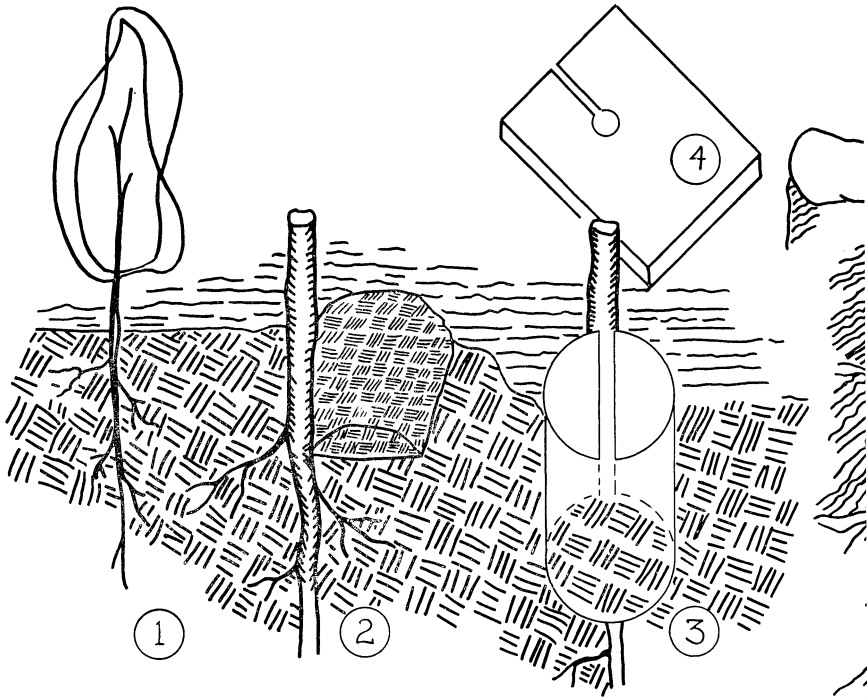
As we were chiefly interested in checking the movement of a nutrient up through the trunk and into the branches and leaves, the soil treatment and root absorption portion of the process was eliminated and the solution was introduced into the tap root in the following manner.

A hole was dug adjacent to the tap root exposing it on one side only, with particular care not to damage the root system. (See Illustration 2.)

A casing was then sunk to retain the well thus formed. In working with two to three-foot and three to four-foot trees, it was found that a one-gallon can, with top and bottom removed and cut through on one side, filled the need. The cut side was placed adjacent to the root and fitted to it allowing a quarter to a half inch of the root surface to be exposed. (See Illustration 3.) Soil was filled around the outside of the casing to prevent drying. In severely dry situations, a moist sponge might be placed in the well.

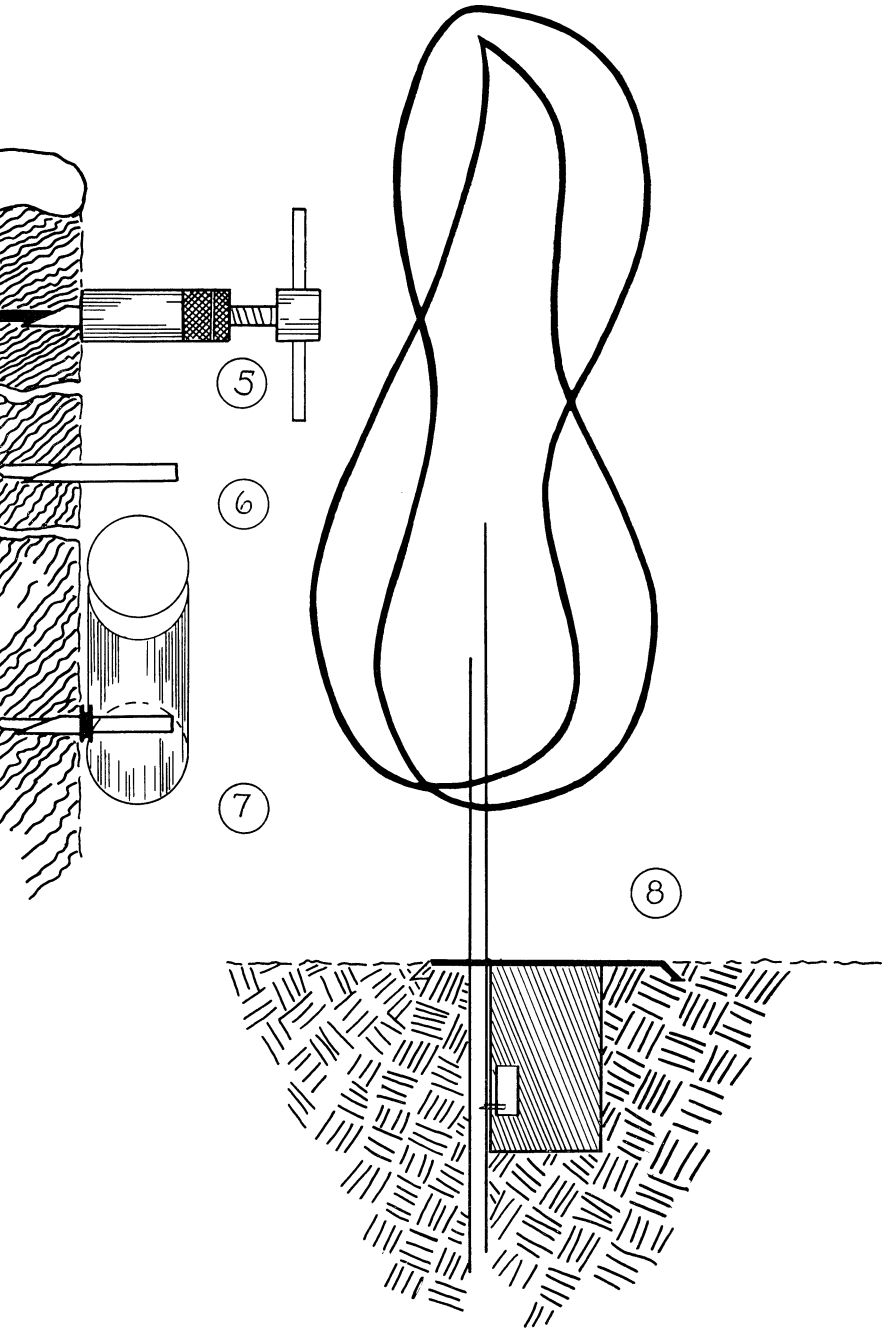
A Mauget feeder* was then attached to the tap root at a point low enough that the reservoir was completely below the

* Available from the Mauget Company, 3361 Union Pacific Avenue, Los Angeles 23, California.



INTRODUCING RADIOACTIVE SOLUTIONS INTO WOODY STEMS OF TREES AND SHRUBS

- 1 TYPICAL PLANT
 - 2 HOLE ADJACENT TO TAPROOT
 - 3 GALLON CAN RETAINER
 - 4 LEAD SHIELD
 - 5 INSERTING TOOL
 - 6 ALUMINUM TUBE
 - 7 PLASTIC RESERVOIR
 - 8 COMPLETED INSTALLATION
- } MAUGUET EQUIPMENT



soil line. An aluminum tube was inserted, using the adjustable inserting tool (see Illustration 5) which allowed the operator to determine the depth to which the tube penetrated the tissue. The tool was removed, leaving the tube in place (see Illustration 6) and the cylindrical plastic reservoir was attached. (See Illustration 7.) It was held in place and sealed to the tube with a rubber gasket. Two sizes are available, one holding about 35 ml of solution and the other about 12 ml.

The radioactive solution was pipetted into the reservoir with a mechanically operated pipette and the well was covered with a lead shield. (Illustration 4) This, in turn, could be covered with a soil mulch to reduce drying. The lead shield was, of course, necessary to prevent radiation from the solution, both from the standpoint of safety and to prevent interference with monitor (Geiger-counter) readings along the trunk and throughout the plant.

This method places the solution below ground and considerably reduces the possibility of accidental spilling of the material by people or animals. (See Illustration 8.)

It also solves the problem of radiation from the source interfering with the instrument readings taken from the trunk, branches and foliage.

On an adequately drained site, normal amounts of rainfall (or sprinkler irrigation) will not cause any difficulty.