

the presence of 1 ppm (a.i.) of either Arbotech or Lignasan (5). Based on volume and weight tables for willow oak (*Q. phellos*), a tree with a height of 70 feet and dbh of 15 inches should have a total volume (all above-ground parts of the tree) of 43.6 cubic feet (6) or an equivalent of 41,747 ounces. Trees of different oak species do not share the same total tree volume based on tree dbh; however, fungicide label injection rates are based on dbh alone. The willow oak example is used here because volume tables are not available for live oaks. Arbotech applied at the rate used in this study would yield an equivalent of 57.0 ppm active ingredient for the total tree volume (excluding roots) and Lignasan would yield an equivalent of up to 15.75 ppm active ingredient. Based on this example, the amount of fungicide injected into each tree should have exceeded the amount required to inactivate *C. fagacearum* by several times.

Systemic infections require systemic distribution of effective fungicides for their control. If Arbotech and Lignasan were uniformly distributed through all functional parts of the tree, including roots, *C. fagacearum* would likely be eradicated with a single treatment. Apparently, the major problem with current treatments is inadequate distribution of fungitoxicants in bole and root tissues of both infected and noninfected trees.

Whenever infected trees are injected, some xylem dysfunction will have already occurred. The

function of fungicides is to reduce or eliminate the fungus population. An ideal therapeutic treatment would successfully arrest the infectious agent in all parts of the tree, including roots, and promote restoration of vital host tissues, while a preventative treatment would not allow infection to occur.

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ABSTRACT

POWELL, C.C. 1984. **Let us spray — but how?** Arbor Age 4(3): 12-17.

Most arborists would agree that spraying is a necessary and vital part of tree care. The fact remains, however, that most spraying operations are extremely inefficient. An understanding of the ways pesticides are applied is required to ensure their success. Pesticides work to control insect or disease problems because of proper attention to four basic "rights." These four rights are: the right diagnosis of the problem; the right selection of material to combat the problem; the right method of application; and the right timing of the application. Because proper application is the key to the success of any pesticide, we will focus our attention on the important principles involved in the spraying process.