TREE CARE: HELPING NATURE WITH SCIENCE

By D. I. DODDS

General Manager

J. J. Mauget Co.

DURING the past decade, much effort has gone into the struggle to halt Dutch Elm Disease. It now becomes obvious that there is no shortcut to a solid, well-rounded program of diseased wood eradication, preventive insect and fungus control and an alert system of detecting and treating trees which have recently been infected.

Highly qualified and motivated plant pathologists concerned with this disease recognize the complexities of the task. Indeed, it is these complexities which do not lead to quick statistical conclusions. Although great progress has been made, proof of control still lies in the predictability and repeatability of tests.

In order to add perspective to current ideas about chemotherapy (the treatment of internal disease by chemical reagents) for trees by trunk injection, let's review what has already taken place. More than 25 years has gone into the development of the Mauget Tree Injection Process.

The January 1958 issue of WESTERN FRUIT GROWER carried an article "Forced Feed For Trees" by J. J. Mauget. He was an affable agricultural consultant specializing in the feeding of plants. He became interested in the possibilities of plant injection feeding after receiving intravenous nutrition in a hospital. Although he later learned that this idea had been around for 500 years, he set about to produce a simple yet effective injection process. The magazine article illustrated both gravity and pressure (up to 40 psi) equipment utilizing feeder tubes. Nutrients were introduced into the xylem tissue without removing tissue by drilling. It was also pointed out that better control of dosage level was needed to avoid defoliation.

In the early sixties, a Mauget capsule was developed. This capsule was pressurized up to 8-10 pounds by compression at time of use. It was placed at intervals of four to six inches around a tree's circumference. Tests showed that a greater amount of nutrients and other systemic materials could be introduced without defoliation or leaf burn than when introducing smaller amounts of material at fewer injection points.

Bidrin Capsules for control of Elm bark beetle, the vector of DED, were registered for a closed system pressure capsule in 1964. This was to be used as a preventive measure. As with many things for which there is a choice between life and death, misapplications appeared. In many cases this preventive measure was frequently used on diseased trees without tissue testing first.

Seven or eight years later it was possible to determine who had continued to use this insecticide application and why. Through these users and their results, we can now demonstrate insect control against a broading range of insects.

Today, the pharmaceutical approach to tree care is under the careful scrutiny of the Environmental Protection Agency. As a small company, we find delay in registration a heavy burden. But you learn to recognize that EPA has an awesome responsibility. As an example, it took seven years of field testing and restricted marketing of one of our products before full registration was granted. During that time, we were asked to provide data where product use on the same trees was accomplished three or more consecutive years without permanent damage. This careful analysis is the same type as the Federal Drug Administration takes in evaluating a compound for human medication.

Much of the current status of the use of benomyl fungicide for combating DED has been widely reported. The only presently approved method of trunk injection is a water suspension of the fungicide placed in a 65 ml (2 oz.) non-pressurized Mauget capsule. It in turn is connected to a feeder tube spaced at a two inch interval to another feeder tube — around the circumference of the tree.

The initial object was to evenly distribute the fungicide to the upper branches and twigs without permanent damage. Dr. Eugene Smalley, plant pathologist, University of Wisconsin, arrived at this procedure. Reasonably broad field testing was accomplished in 1971. The results justified registration and useage on a broader scale in 1972 and 1973. This was the initial step, one that would ultimately result in a more refined and effective method.

Utilizing the decade of experience, the Mauget Company has now developed a solubilized form of benomyl. It has been field tested on a broad range of pathogens and trees with particular attention to the observation of any phytotoxic effects. Although it is currently not available, this product has been issued the trademark Fungi-Sol systemic fungicide. When approved, it will be packaged at controlled dosage levels in the regular Mauget closed system pressurized capsules. Concentrations of active ingredients

(continued on page 49)

TREE CARE
(from page 14)

will be up to two percent or 20,000 ppm.

The improved formulation of this product is unique to the widely acclaimed acid solubilized benomyl fungicide. Fungi-Sol is practically neutral (pH 6.8) as compared to the highly acid pH 1-4 range previously reported.

In another extension of the presently approved method, the non-pressurized capsules are replaced by a manifold system of plastic tubing fed and pressurized by a pressure sprayer containing benomyl suspension. Field test experience in 1973 pointed to the fact that lower pressure (10 psi) permitted greater amounts of the fluid to enter the tree than did higher pressure. While the manifold system is not registered yet, it too holds promise for the future.

We believe the Mauget feeder tube method offers yet another advantage. The tube is placed into the active xylem tissues of the tree (the last two or three growth rings). Systemic fluids are promptly carried away from this point and diluted by the fluids of the tree. This widens the formulating parameters and minimizes the difficulty experienced with high density woods.

By comparison, slant hole drilling goes well beyond the active xylem tissues. When many materials remain there for extended periods, a considerable amount of discoloration and cell degradation takes place. This further compounds the problem of healing and greatly increases the time of exposure to insects and disease.

As with the medical profession, the arborist who treats trees that are the property of others must be responsible for the residual amounts of chemical. In addition, the amount of liability assumed increases greatly. With both the quantity and quality of the contents in closed capsule systems established by extensive testing and Federal registration, an applicator is on much firmer ground in event of litigation.

In the medical field, chemotherapy is considered a high technology. There are obvious reasons why it should receive the same consideration in the tree care field. The corresponding level of professional responsibility has been established. Seminars on tree injection have been conducted by our company in cities across the nation. More will be conducted this year.

Additionally, the more than 500 experienced and highly trained arborists in the country utilizing the Mauget Process will provide a practical, continuing testing laboratory. They provide the means whereby new developments may be field tested to achieve more knowledge quickly. This network of "field scientists" will augment the university scientific force tremendously.

With greater knowledge, better communication, new systemic chemicals, improved methods of evaluation and application, it may be possible to overcome the pitifully small amount of funds expended into research on shade and ornamental trees.□

ONE INCH OF RAIN on an acre of ground amounts to 27,154 gallons of water. How is this determined? According to the Du Pont Company, one inch of rain on 43,560 square feet = 6,272,640 cubic inches of water or 3,630 cubic feet. A cubic foot of water weighs 62.4 pounds, so 3,630 cubic feet equals 226,615 pounds or 113¼ short tons. The weight of one gallon of water is 8.3 pounds, so an inch of water equals 27,154 gallons.