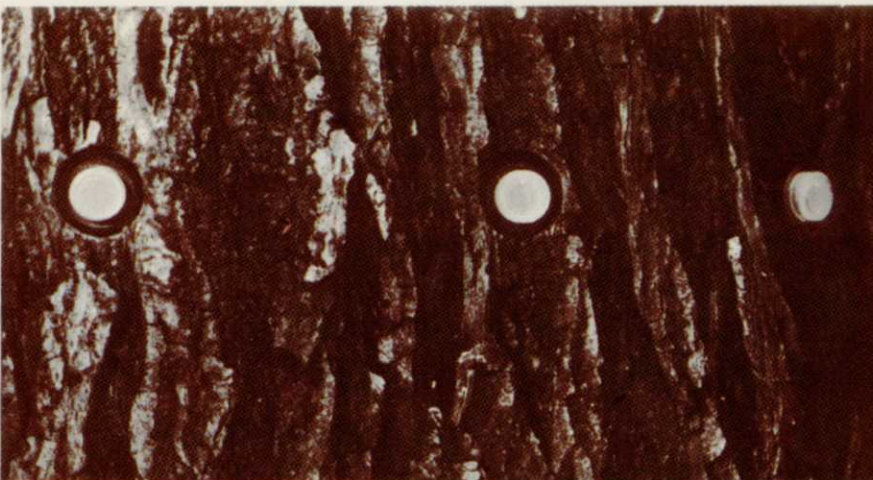
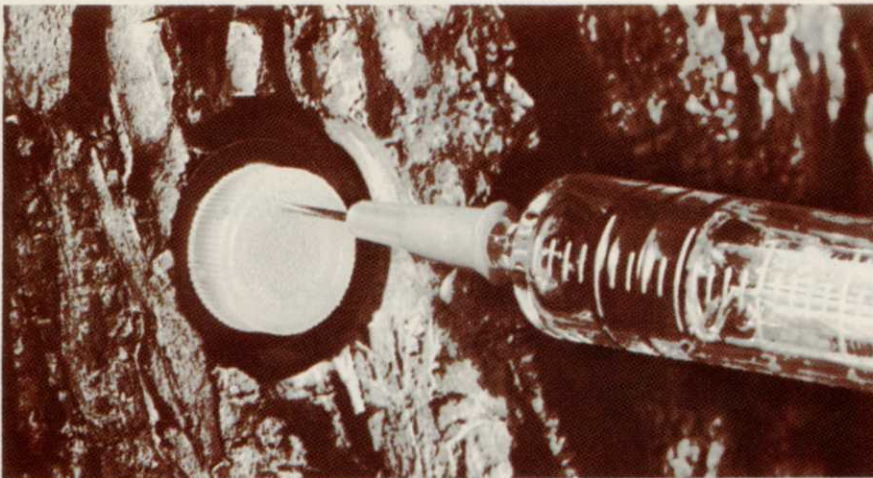
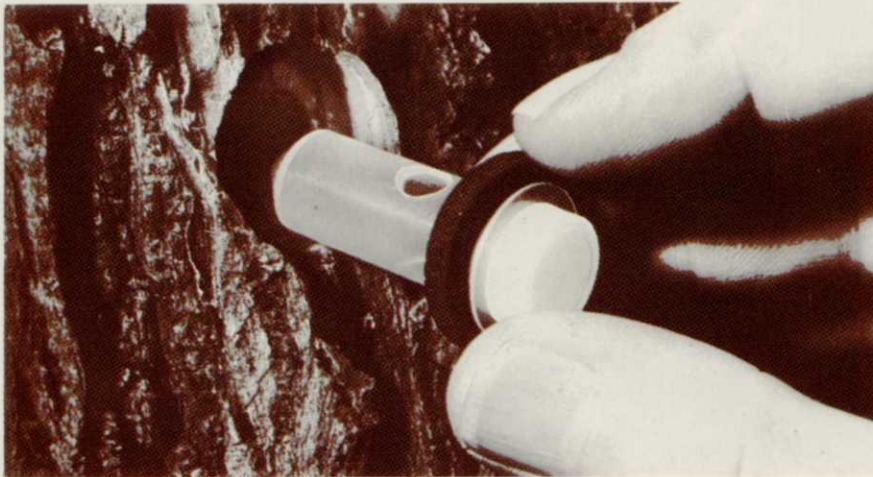


Tree



Sophistication in tree injection systems is becoming more evident as scientists continue to probe for ways to control Dutch Elm Disease.

Presently, at least a half-dozen systems are being tested or are in commercial use across the country. Each is a variation on the general theme that medication (chemicals) placed within the tree has a better chance of controlling the disease than foliar sprays, sump, collar or other methods of chemical application.

One of the newest techniques to be introduced to arborists is SIReservoir, manufactured by Systemic Implant Reservoir Corporation of Madison, Wisc. It was developed by John Reynolds, Ray Carroll and Dale Norris whose interest in tree care and DED span a total of 80 years of combined experience. All three have worked on chemical treatments, sanitation, rootgraft control and combination measures for suppressing DED.

SIReservoir is described as simple, effective, refillable and economical. Handy is another word, because injectors to treat six to ten trees can be carried easily around in a jacket pocket. Moreover, although a certain degree of care must be exerted, an unskilled arborist quickly becomes skilled after injecting two or three trees.

Here's how the system works. Using a $\frac{3}{4}$ -inch spade bit, a counter sink hole is drilled to the level of smooth bark surface. This forms an outer lip which the visible part of the injector casing fits snugly. A $\frac{1}{2}$ -inch bit finishes the job. Bit is in-

A $\frac{3}{4}$ inch spade bit is used to counter sink hole thru bark (top left). Hole into xylem tissue is made with $\frac{1}{2}$ -inch bit. SIReservoir injector is inserted into tree (2nd from top). Using hypodermic, chemical is placed into injector (2nd from bottom). Completed application (bottom left) show injectors spaced at 5 inch intervals.

Injection Systems

Modern Clinical Method To Healthier Trees

serted into the first hole and drilled to a two inch depth. Hole is then cleaned of shavings.

The next step is to place a SIReservoir injector cartridge into the hole. The bullet-shaped cartridge of plastic construction has release holes on two sides and these should be always in a vertical attitude. Sap moving in the xylem tissue enters from the bottom hole and exits out the top.

Once the injector is in place the last step is filling it with chemical. Each injector holds up to four milli-

liters (ml) of liquid per filling and can be refilled as often as needed. A standard syringe with a 19-gauge hypodermic needle is used as the injector.

Corporation officials advise that SIReservoir should be spaced at five inch intervals on the trunk circumference.

Last year several thousand elms were subjected to this new system. Data from laymen and professionals confirmed the practical effectiveness of the system when used as instructed.

Like other systems reported in WEEDS TREES AND TURF, SI-Reservoir logically and scientifically has all the necessary apparatus to work. While it may be said that some arborists are not in favor of small tree wounds (drilling) research conducted by the Illinois Natural History Survey indicates that the inflicted damage is minimal and the tree quickly develops callus tissue in this area. (See WTT, Aug. 1972, p. 16 for related story)

Additionally, a tree 30 inches in circumference would require six injector units. The tree tissue removed by drilling one hole is about $3\frac{1}{2}$ square inches. Multiplying this by six gives a total of about 21 square inches of removed tissue. In comparison to the total volume of the tree, this is not much more than a needle pricking a man's arms.

To date, Benlate benomyl fungicide is the only product with Federal registration to "aid in the control of Dutch Elm Disease caused by the fungus *Ceratocystis Ulmi*." Depending on who is speaking, researchers around the country are talking both hot and cold on the effectiveness of this material. Generally, all point to
(continued on page 50)

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TREE INJECTION SYSTEMS (from page 15)

controlled studies in laboratories where Benlate has demonstrated unquestionably its ability to control the disease. Field studies have not generated quite the same positive response, however, and herein lies the doubt.

Almost everyone will agree that more field studies are needed and data thoroughly analyzed before a conclusive recommendation is made. This accounts for the kind of "holding back" response of certain state regulatory agencies and a few extension service pathologists. Even the Du Pont Company, manufacturer of the compound, has been most conservative in promoting the product for this purpose. The nature of the disease in affected trees is such that no one can be positive that treatment will be 100 percent effective. Some trees respond to treatment and some don't.

Since all injection systems utilize Benlate as the material for treatment each has about as much success as the next in the actual control of the disease. Lack of control is not the fault of the equipment and not the fault of the chemical. Rather, it is interaction of the disease and the

physiology of the tree.

It has been pointed out that the benomyl (active ingredient of Benlate) molecule is essentially insoluble. WEEDS TREES AND TURF has also reported that scientists have achieved a breakthrough in solublizing this chemical (See WTT, April 1972, p. 13). Thus, scientists hope that by making the chemical soluble, it will be in a form more readily acceptable to the diseased tree.

Only a very small amount of the chemical is needed to control the disease in the lab. The same small amount is needed in the tree at the point of infection. Present systems place the chemical into the xylem tissues in the trunk. But with the exception of the high pressure injectors, these systems rely on the tree to move the material from the point of application to the diseased tissue. Solublizing benomyl will hopefully aid the tree in transporting the chemical, but many tests must be conducted before anyone can begin to predict with accuracy the degree of control.

In the meantime, injectors developed by corporations such as Systemic Implant Reservoir Corp. are

the result of endless hours of experimentation, consultation, and perfection. Given an elm that has just contracted the disease, SIReservoir injectors have demonstrated a high degree of reliability in dispersing chemical to the tree.

Specific case histories are, as yet, few. SIReservoirs injectors are new and many arborists are only now hearing about them. In Wisconsin, where probably more American elms were treated with Benlate last year than in any other state, these injectors were used in a goodly number of elms saved.

One specific instance was that of a newly diseased elm on the lakeshore property of a Madison insurance man. Flagging was estimated at about five percent. Treatment with Benlate and SIReservoir injectors was begun immediately. Repeated dosages were made at one week intervals for about six weeks. At that time it appeared as though the disease was arrested.

Arborists treating DED with Benlate should not think of the job in the same terms as correcting iron chlorosis. There's a great deal more to consider in order to get the same results. At this time trees with less than 10% crown will have about a

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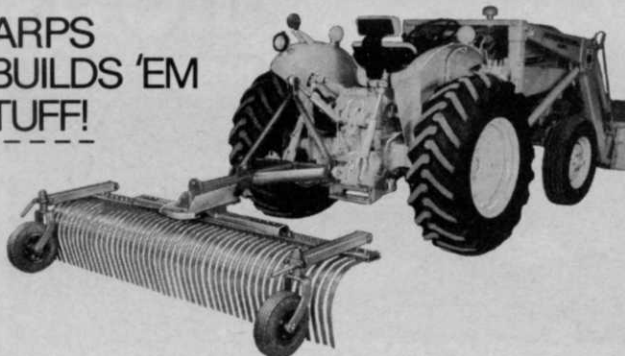
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50-50 chance of pulling through. Best results occur when the arborist spots flagging in the initial stages and begins treatment immediately.

The sharp arborist eyes the situation beginning at the tree top and then moves down to take in such things as other elms adjacent to the diseased elm, elm bark beetle infestations, regular tree maintenance and other standard practices. Of equal importance is nearby dead elms which continue to be the main source of disease.

Many arborists are beginning to report increased use of injection systems because of a willingness of the customer to do something about a diseased elm and the potential for making a sale by treating the elm. As one homeowner explains it, "It is better to spend a few dollars to try to save an elm than to spend several hundred dollars to have it removed. We want to keep our trees, not have them removed."

The future of SIReservoir appears optimistic. Its success in Wisconsin last year is expected to be duplicated in other states this coming season. And as more knowledge is gained in the control of DED, this injection system will no doubt play an even bigger role. □

All-Ohio Safety Congress Feature Arborist Session

The 43rd All-Ohio Safety Congress will be held at the Sheraton-Columbus Hotel, Columbus, Ohio on April 10-12. A special arborists and tree service operators session is planned for April 11.

Theme of this year's session is "Safety is a Shield." The current program of the all day session includes nine speakers.

Topics include what manufacturers are doing about noise abatement, chain saw safety, employee safety practices, treatment of accident victims, rope safety and the tree of life safety program.

For more details, contact Dr. L. C. Chadwick, 3634 Olentangy Blvd., Columbus, Ohio 43214.

Turf Products Catalog Issued By Toro

The Toro Company, has announced the availability of its 1973 institutional catalog of turf maintenance equipment.

The catalog contains double-page reproductions of nine full-color photographs of the Toro equipment.

On the fly-leaf of the left-hand pages are complete specifications on the various models of each machine and their accessories.

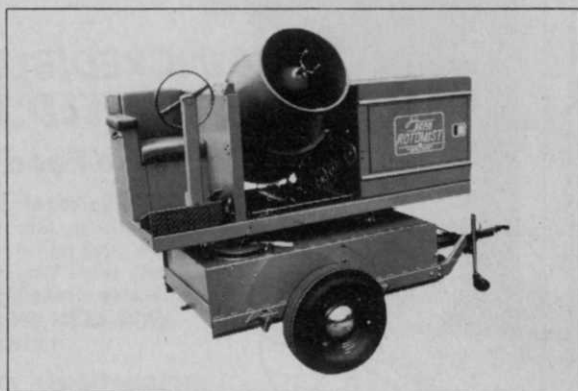
Penn-Del Chapter, I. S. T. C. Holds Arborists Course

The Penn-Del Chapter, International Shade Tree Conference and the Pennsylvania State University have just completed a course for beginning arborists in Philadelphia.

Twenty students enrolled in the week-long course which was taught by Andrew Moore, Mayland Professional Tree Surgery, Lansdale, Pa. Moore designed the course of instruction as part of his duties as chairman of the educational committee for the Penn-Del Chapter. Students had classroom instruction for half the day and field training during the second half.

Stressed in the sessions was climbing, pruning, use of hand and power tools, tree removal, wound treatment, climber's safety, tree identification and other important aspects of arboriculture.

The Fairmount Park Commission, Philadelphia, provided the field laboratory for students to work.



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