be removed after treatment. The chemical is described as a cell toxicant which reacts with vital enzyme systems.

Aqualin is not toxic to fish after 24 hours. Animals will not drink recently treated water because of the obnoxious quality. There are dangers in application, an example being when treated water is allowed to flow into crop areas. For this reason Johnson feels legislation should limit use of this type chemical to qualified and licensed contractors or applicators.

Only Two Contractors Licensed

At present, Southern Mill Creek Products, which distributes aqualin in Florida, has licensed only two contractors to apply the herbicide, along with governmental agencies.

Part of the application system being used by Johnson includes a trailer to transport the airboat from one site to another, and a one-ton pickup truck, complete with four-wheel drive and snow tires.

Training is needed for job estimating, job planning, and in treating, Johnson says. Acrolein is being applied at rates of five to seven ppm of water. Thus, a careful analysis is needed regarding inflow and outflow of water, turbulence, and other factors.

Johnson works closely with the Hyacinth Control Society, Inc., which serves as a training agency, through regular meetings. This Society serves commercial applicators, flood control personnel, U. S. Army Engineers, mosquito control agencies, county and state officials and others. Research on aquatic weed control materials and procedures receives high priority at the U. S. Department of Agriculture field laboratory at Plantation, Fla., staffed by Dr. Lyle W. Weldon, research agronomist; Robert Blackburn, botanist; and Dr. Carey Stewart, plant physiologist.

Beautiful it was along this Waukegan, Mich., street in this News-Sun photo on Aug. 3, 1962...

It's Freers Elm Arrester

FREERS ELM Arrester, a new product developed by Charles R. Freers, Muscatine, Ia., has been granted USDA registration on a regional basis. It is being marketed in Illinois, Iowa, Indiana, and Missouri.

According to Freers, extensive testing has shown that the new chemical compound will arrest the fungus of Dutch elm disease, after the tree has been partially affected. Freers says the product is applied by direct injection into the trunk of infected elms. Its function is to arrest the disease, and prevent spread of the fungus throughout the rest of the tree. In tests over a 9-year period, Freer reports that many trees have continued to live.

In a healthy elm, Freers reports, injection of the chemical will prevent DED from developing even though the elm bark beetle has carried the fungus to the tree. The product, he states, has been found to be most effective when booster injections are given about every two years. Elm trees which are heavily infected, however, cannot be saved. The chemical compound, being sold as Freers Elm Arrester, is not phytotoxic, nor does it adversely affect the beetle. Instead, according to Freers' report, the chemical is selective in destroying the fungus which is carried by the elm bark beetle.

Effective spraying and good tree sanitation, as a preventive program, have protected many elms. This has been possible where the beetle has been controlled. But, once the tree has been infected with the fungus, survival is seldom the case. No treatments are in use which will control the fungus. This control has been the goal of Freers in development of his treatment.

Another case in point which Freers believes his new product can solve is infection of trees by root graft. Many elms, he believes, contract the disease as a result of transmission via the root system when roots of infected elms and healthy trees form root grafts underground. In such cases, spraying for the beetle is ineffective. But, Freers states, injection of Freers Elm Arrester can save the tree.

Evidence of DED in a tree such as "flagging" is a signal to use the new product, according to Freers. He believes that it no longer need be a sign that the tree is doomed.

Freers has been an arborist for more than 30 years and has operated the Freers Tree Service of Muscatine. He spent almost a decade in development of the product and in experimental work and testing. The last three years, he states, have been most important. It was during this period—on a federal test plot and following the USDA requirements for evaluating the effectiveness of products claiming use in the

then Dutch Elm disease paid its ugly visit, leaving this scene on Feb. 25, 1969.

cure, control, or arrest of DED—that the product proved to have arrestment capability. Now that federal registration has been granted in four states, he expects similar registration in other states soon.

Freers has formed a corporation in Iowa known as The Freers Company of Muscatine. His firm will be involved in manufacturing the chemical, selecting franchised applicators, training such applicators, and administering the entire field franchise operation.

Hercules Predicts Growth In 'Visko-Rhap' Usage

Because "Visko-Rhap" herbicides provide effective control plus low drift, their already wide-spread use will expand even more in 1969, says Hercules, Inc., Wilmington, Del.

Developed by Hercules' Agricultural Chemicals Division, Visko-Rhap herbicides are special formulations of 2,4-D, 2,4,5-T, combinations of these, and silvex. They deliver a thick, regulated spray that resists wash-off and evaporation, according to Hercules, and not only clings to but penetrates leaf surfaces. Because of their mayonnaise-like thickness, Visko-Rhap formulations don't drift off target when applied, Hercules says.

The herbicides, applied by ground, air or aquatic equipment, can be used on county roadsides, utility rights-of-way, in drainage control districts and on various crops.

Pennsylvania Group Elects Grau Executive Director

Dr. Fred V. Grau, long active in the turfgrass industry, has been appointed Executive Director of the Pennsylvania Turfgrass Council, according to Council President Don Krigger.

His many achievements in the turf industry include helping to develop Merion bluegrass, Meyer Zoysia and U-3 bermuda and discovering and developing—with the aid of his late wife—Penngift crownvetch.

Grau's turfgrass career includes work at Penn State as Extension Agronomist, where he worked closely with the late Professor Emeritus H. B. Musser—pioneer in turfgrass research and education and formerly the Council's Executive Director. Grau was also consultant to West Point Products, to Nitroform Agricultural Chemicals, and to Hercules, Inc. Since 1965 he has devoted his full-time effort to Grasslyn, Inc., the firm he and his wife established.

Grau is a life member of the American Society of Agronomy and of the American Association for the Advancement of Science. He holds honorary memberships to several golf course superintendent associations and in 1954 was awarded the Distinguished Service Tribute by the Golf Course Superintendents Association of America. Last January he won the U.S.G.A. Green Section Award.

Neeley Reveals Pros, Cons Of Fertilizing Trees

Dr. Dan Neeley, Illinois Natural History Survey plant pathologist, pointed out both the benefits and drawbacks of fertilizing trees at the University of Maryland's Arborists' Day held in College Park.

Tree fertilizers serve four functions, he said: (1) spurring rapid growth; (2) improving tree's appearance; (3) retaining vigor and safeguarding against diseases; and (4) regaining vigor after damage by disease, drought, insect pests, mechanical equipment.

On the other hand, Neeley explained, fertilizing trees may have drawbacks.

"You will have to mow your lawn more often," he said. "You may need to prune more frequently. And you may actually decrease the amount of flowering or fall color. Some plants may develop a weepy appearance."

To decide whether or not to fertilize, Neeley suggests checking the growth rate of your trees and examining the condition of your soil.

Twig growth, he said, can be determined by comparing the amount of space between the first and second—or last two—sets of bud scale scars. Growth can also be checked by removing a plug from the trunk to see if the latest ring is wider or narrower than the previous one.

Soil should be examined for depth (the deeper, the better), texture, structure and sub-soil, Neeley explained.

If fertilization is in order, Neeley recommends an annual application of nitrogen in April or May at the rate of 6 lbs. per 1000 sq. ft. of ground. Phosphorus and potassium need to be added only at 3- to 5-year intervals at the rates of 3.6 lbs. per 1000 sq. ft. and 6 lbs. per 1000 sq. ft., respectively, he said.

For a free publication entitled "Fertilizing and Watering Trees," write Dr. Neeley at the Survey, Urbana, Ill. 61807.

Next Issue / *J. R. Watson tells about the science of mowing grass*