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JOHN BEAN DIVISION

Lansing, Mich. – Orlando, Fla. – San Jose, Calif.

Noninfectious Tree Disease

(Continued from page 11)

several feet in length along the trunk, and are most often within ten feet off the ground on the north side of a tree. However, they may occur at any height and on any side.

Most frequently such cracks provide openings for invasion of insects, bacteria and fungi. But apparently many heal without infection, or at least there is no evidence of any for many years. If healing is clean, fresh callus tissue in the following spring and summer will often close-over the opening. But once weakened, the stem may crack again under more mild conditions than at first. Such cracks may be repeatedly opened following successive healings, by nothing more than swaying of the tree by the wind. Since the callus tissue tends to protrude more and more with each opening, after several years a pronounced "frost rib" may develop, representing an exaggerated protrusion of vertical woody growth running up and down the trunk for several feet. In addition, many frost cracks become infected with wetwood bacteria, so that bacterial exudations themselves may predispose the stem to repeated cracking, and many frost ribs are characterized with a constant seepage of foul-smelling sap from such exudations. Wetwood infections may also predispose stems to frost cracking, but the reverse is probably most common.

Internal evidence of cold injury involves activity of cambial cells following damage. Where the cambium is not killed completely, it is stimulated to abnormal growth and the formation of frost rings. Since some of the cambial cells are killed, or some of the first cells produced from them may die, the tissue may contain collapsed cells, and to that extent is physically distorted. For reasons not well understood, many cells produced from damaged cambial tissue fail to differentiate properly when growth first begins, so that in the early part of the growth ring there is often much undifferentiated tissue composed exclusively of parenchyma cells. One explanation may be that the separation of the bark from the wood leads to growth of excessively large new parenchyma cells. The combination of collapsed dead cells and the soft undifferentiated parenchyma cells results in excessively broadened rays, misalignment of rays in the wood with those of the previous year and generally distorted tissue.

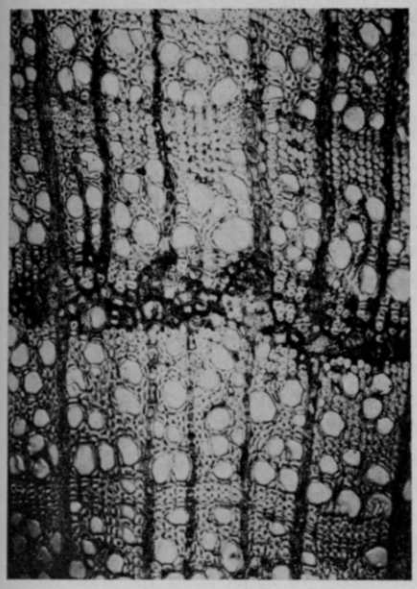
Unless killed completely, the stem may recover its growth balance shortly after growth begins, when a solid ring of cambial tissue is established through regeneration. Then as growth becomes regular, excessive parenchyma disappears, differentiation becomes normal, and rays become straightened in the advanced areas of the growth ring.

Sometimes, however, whole areas of cambium are killed outright in basal stems of trees. Because the water-conducting tissues of the previous wood are unaffected, growth above the injury may begin and advance normally for some time. Eventually, if the entire stem was girdled, the top will die. If only a portion of the stem was killed, the stem may die partially, completely, or not at all, depending on circumstances. Tissue weakened or killed by cold ordinarily will be invaded by a wide variety of insects, bacteria, and fungi. It then becomes a race between weak predators or parasites and the regenerative powers of the tree that will determine the outcome. Not the least of the determining factors influencing the situation at this point are the climatic factors involving temperature of water.

Dramatic closeup of frost ring in woody tissue of apple, showing misalignment of rays, broadened bases of rays in the early growth of the ring, and excessive number of darkly colored parenchyma cells.

Mechanics of Freezing

The phenomena of freezing injury to plant tissues is basically one of dehydration. Water in plant tissue is either between the individual cells (intercellular water) where it is pure, or within cells, (intracellular) where because of dissolved salts, sugars, minerals, proteins, and other substances it is anything but pure. Pure, intercellular water freezes at or near 32° F, whereas intracellular water freezes only at much lower temperatures. For many years it was believed that freezing expanded the water in plant cells causing them to swell and rupture, but it is now known that plant cells actually contract. The first thing to happen in the freezing of plant tissue is the formation of ice crystals between the cells. This decreases the vapor pressure around the cells, causing water within cells to diffuse out through cell walls by osmosis. As the intracellular water moves out into the intercellular spaces, it freezes, adding to the ice crystals already there. This decreases the turgor pressure within the cells, causing them to contract. With ice formation between cells and shrinkage of cells, the ensuing dynamic stresses and tensions may be sufficient to cause physical rupture of tissues. If the cells remain intact, they become less vulnerable to freezing damage, unless the temperature continues to drop; containing less water, their freezing point has decreased. Such cells may remain "undercooled" without actually being frozen, even at temperatures below freezing, because of high content of fatty substances in cell membranes and proteins in the internal water. Both of these conditions have the net physical effect of insulating the water from freezing. But if the temperature drop is extreme, and especially if it drops suddenly, ice crystals may eventually form inside cells, rupturing the cell protoplasm and membrane, thus killing the cells. According to one authority such an extreme situation has not actually been observed under natural conditions, but the



Protrusion, in this closeup of a frost rib in cross section of an elm stem, is associated with bacterial wetwood and heart-rotting fungi.

conditions making it possible are known to occur.

Following direct freezing of plant tissue without formation of intracellular ice, the affected cells may recover or not. If the contraction of the internal protoplasm has been severe, protoplasmic coagulation may occur to a degree that is irreversible, and the cells may die. The extent of recovery possible will depend on the manner of thawing, during which the cells can be injured further. On thawing, the intercellular ice melts first, causing a flow-back of water into the cells with a subsequent swelling of the protoplasm. If the rate of thaw is rapid the swelling may be so sudden that the cells may rupture. The manner in which cold-affected cells become sensitive to turgor pressures not affecting them previously, and the decreased elasticity of the cell membrane to moisture changes following injury, indicate that freezing even without intracellular ice in some way alters the permeability of the membrane.

Synthetic studies of slow freezing damage indicate, that following intercellular ice, ice forms between walls and membranes first, in cytoplasm next, and in the vacuole last of all. The nucleus is the last of the protoplasm to be affected. Within the cell then, the degree of susceptibility appears to be largely positional, since in mature cells the vacuole lies at the center of the cellular complex. For the most part, however, cellular damage results from collapse of cells alone, without internal freezing, and from tearing or bursting of tissue following freezing of intercellular water and subsequent thawing.

Although the mechanism of freezing injury is similar for plant tissues generally, all cells and tissues are not necessarily affected in the same way. Apart from heritable differences not expressed structurally, differences in susceptibility and sensitivity result primarily from differences in structure of tissue, and location and exposure of species. Some plants are affected only mildly or not at all because of their capacity to become "hardened." Hardening involves a gradual conditioning through repeated exposure to slowly increasing coldness. During this period there is time for newly formed tissues to mature fully, and the cell walls of both inner and outer tissues become impregnated with various degrees and types of exposure-resistant chemicals, such as: the cutin of shiny leaves; the suberin of corky bark; the cellulose of all plant cells; and the lignin of woody cell walls. In addition, there is a gradual loss of water, so that hardened tissues are relatively dry. Woody plants generally begin hardening off immediately after growth ceases and become progressively cold resistant with approaching frost. These species are characterized by formation of truly terminal buds on ends of branches, in contrast to "pseudoterminal" buds. The latter type are typical of species which do not cease growth until literally stopped "cold" by freezing temperatures. Interestingly, some of these same species, such as the willows, are among the first to resume growth in the spring. This practically guarantees their premature exposure to a certain degree of late frost in the spring, but such species appear to be relatively resistant to such frost, suggesting an adaptation to these conditions.

Destruction of terminal meristems by freezing changes the distribution of auxin which regulates the growth of lateral branches. As with death of terminals from any cause, dormant meristematic tissues in the living stem below the injury may be stimulated to activity. The result may be a profusion of so-called water sprouts appearing as lateral branches in an irregular pattern, or the internal formation of aggregations of tightly packed and sometimes distorted cells, whose growth is short lived. The net effect of such internal tissues may be to interfere with the normal development of food and water-conducting tissues (phloem in bark, and xylem in wood).

The net affect then of freezing may include: partial death of leaf tissue to vigorously growing plants; dieback of terminals; death of cambial tissue, abnormal cell formation, with formation of frost rings in woody plants; failure of new cells to differentiate, with the formation of excessive parenchyma; formation of callus tissue; stimulation of dormant meristematic activity; and complete death of all or parts of individual trees.

Part II will appear in a later issue—Ed.

Plans Being Completed for 12th Fla. Turf-Grass Conference

Final arrangements are now being made for the 12th Annual Florida Turf-Grass Management Conference set for Gainesville, August 25-27, on the University of Florida campus there.

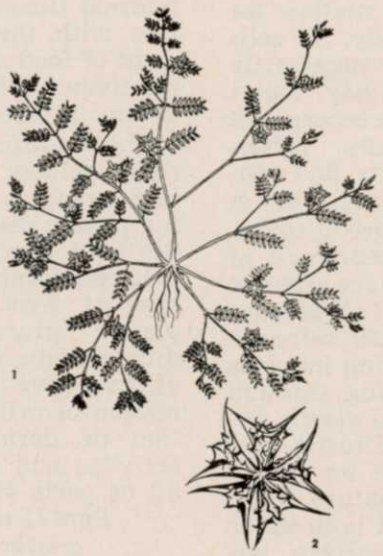
In addition to details announced in W&T last month (p. 20), spokesmen now announce that speakers and turf professionals for the event will be drawn not only from Florida, but from surrounding southeastern states and the Caribbean.

Included in the annual seminar are separate sessions devoted to the specific interests of various turfgrass management groups. Included are discussion groups covering golf course turf; horticultural spraymen and lawn service agencies; retail dealers and garden supply houses; industrial sites; and nurseries.

Those who wish to attend may write for further information to: Dr. Granville C. Horn (or John C. Cabler), 401 Newell Hall, University of Florida, Gainesville; or Walter D. Anderson, Executive Secretary, Florida Turf-Grass Association, 4065 University Blvd. North, Jacksonville.

PUNCTUREVINE

(Tribulus terrestris)



Puncturevine, an annual which reproduces by seed, is variously known as sandbur, bur nut, and tackweed. It is found on barren soil, waste places, and roadsides in North America; it is somewhat more common on the sandy soils of arid regions. Puncturevine is listed as a noxious weed by several states. It has been called the "most disliked weed"; and this dislike is reflected in the Latin origins of the technical name, which roughly means "affliction from the earth."

A member of the caltrop family, Zygophyllaceae, puncturevine has a circular prostrate habit of growth. Radiating stems trail away from the crown to a distance of 8 feet, hugging the ground, forming dense mats.

Stems are freely branching, and may turn upwards at the ends when plants are in competition for light. Stems are covered with fine hairs which give plants a silky, shiny-green coloration.

Leaves are opposite on the stem. Each leaf is made up of 4 to 8 pairs of small, oblong, rounded leaflets; these, too, are hairy.

Solitary, small, bright-yellow flowers, each with 5 petals, are found in the axils of leaves (where leaf meets stem). These short-stalked flowers open only in the mornings. Flowering begins when a plant is still small and continues on new growth throughout the growing season.

After blooming, seeds are formed inside spiny hulls or burs. Each flower will form 5 flat, spiny burs. Each horny bur contains 2 or more seeds and is armed on the outside with 2 sharp spines. These spines are tough enough to penetrate shoes, and bicycle tires.

Seeds remain in the soil, sometimes many years, before germinating under favorable conditions.

The root is a simple shallow taproot.

One-half to 1 lb. of 2,4-D per acre applied before puncturevine flowers, and while it is actively growing, will kill the plant.

Applied after blooming, 2,4-D will kill the plant, but will have no effect on the seeds already formed inside the matured burs, nor on the spines of this vicious weed's seed pods.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

LA Agency Plans New School to Teach Aspiring "Plantsmen"

A new program sponsored by the Los Angeles Department of Arboreta and Botanic Gardens will seek to train would-be professional gardeners and landscapers in the fundamentals of horticultural science.

Known as the Arboretum Gardener School, the program will last for 42 weeks, and will be offered in the Agency's facilities at 301 North Baldwin, Arcadia, Calif. Starting date is September 28.

Division of the course into both lecture periods and on-job training is expected to offer students a well-rounded background in the subject. Included in lecture periods are discussions of botany, plant identification, plant propagation, turfgrass culture, insects, and diseases.

In the practical phase, greenhouse practices, nursery skills, and related techniques will be taught. There will be field trips to commercial nurseries and botanical gardens.

On completion, officials will award course completion certificates, and will assist in job placement for qualified graduates.

There is no charge for this unique course. Those interested in enrolling should write to Dr. Louis B. Martin at the address given above for further information and an application form. Interviews may be arranged by appointment.

"Fairway Food" New From IMC

A new fertilizer which combines natural organic nitrogen, and IMC Pot O'Gold ureaformaldehyde, has been introduced by International Minerals and Chemical Corp. Called IMC Gold Cup Fairway Food, the turf nutrient is said to provide quick response and slow, steady feeding.

Proportioned phosphate content assures root formation and root growth, IMC says. The material is packaged in 50-lb. bags.

For more information write Lawn and Garden Department, International Minerals and Chemical Corp., Skokie, Ill.

make a killing with TRITAC™

Profit from this powerful new herbicide for control of bindweed, Canada thistle, Russian knapweed, hoary cress, leafy spurge

Bindweed on May 23, 1963, just before Tritac treatment . . .

looks like this on August 14, 1963. Rate: 15 lb. (7½ gal.)/A.

You can effectively custom-treat an acre for a season or more with as little as four to eight gallons of Tritac.

Used along highways, fence rows and other noncrop land, this economical new herbicide controls certain deep-rooted perennial weeds under a wide range of climatic conditions.

When you want quick foliage top kill or want to prevent seed formation, use Tritac-D(TM)—the basic formula plus 2,4-D.

Both Tritac and Tritac-D are noncorrosive and low in toxicity to mammals.

Tritac, for the first time, is now available in a new granular form called Tritac-10G.

Liquid Tritac is available in cartons of six 1 gallon cans; also 5 gallon cans and 30 gallon drums; granular Tritac is packed in 25 pound paper bags.

Hooker sodium chlorate. This original one-shot weed killer is available in steel drums of 50 and 100 lb. net.

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Expanded Hyacinth Controls, New Spray Systems On Society Agenda at Tallahassee, June 28-30

Will chemicals alone defeat the mammoth aquatic weed "plague" in the Gulf and southeast Atlantic states? This question pondered by delegates to the fourth annual Hyacinth Control Society meeting in Tallahassee, June 28-30, began to weigh more heavily as speakers presented some new ideas in the works to control runaway water weeds.

A promise of better things to come was evidenced by Julian J. Raynes in his description of the 6-year-old program—Expanded Project for Aquatic Plant Control—authorized by Congress in 1958. Raynes is with the Master Planning Branch of the U. S. Corps of Engineers which carries out the expanded program to come up with improved control methods.

Expecting renewal of the Project after two more years, Raynes stated, "At a time when every effort is being made to conserve and utilize natural resources for their highest and best use, the losses incurred because of obnoxious aquatic plants on our waterways, streams, and tributaries are of great importance when we consider that water resources are not depleted or used up, but can be used over and over again by the public."

A serious problem in the Carolinas, Raynes said, is alligatorweed. Under the guidance of the Corps' program a promising insect has been introduced for control of this weed pest. The insect is a South American flea beetle, genus *Agasicles*. It has passed all tests to date and found to be host specific for alligatorweed. It is hoped that this attempt at biological control will lessen the alligatorweed problem in the South.

New Spray System Bows

Drift has, since the introduction of growth regulator chemicals, such as 2,4-D and relatives, been a great problem for applicators of these herbicides. Improved formulations introduced from time to time somewhat lessened the danger of accident. Now, a new application method seeks to eliminate this worry altogether, Dr. R. E. Ogle, Hercules Powder Co., Wilmington, Del., revealed.

The new system is called the Rhap-Trol Spray System and has as its principle a water-in-oil emulsion rather than an oil-in-water type. This is called an invert emulsion.

"Although invert emulsions have been recognized since 1931," Dr. Ogle explained, "only recently have the mechanical developments in equipment enabled us to apply them commercially."

"The system provides for continuous mixing and emulsion formation in small chambers of bi-fluid mixing nozzles," Dr. Ogle detailed. "This is carried out by bringing the chemical (oil-based) and water through separate lines to the mixing chambers where a thick water-in-oil emulsion is formed and sprayed simultaneously."

Such a system according to the Hercules expert, will prevent drift because the uniform droplets are produced large enough to fall directly to the target, yet small enough to cover the target plants adequately.

The Rhap-Trol Spray System can be adapted to any size operation, from aerial application to a single man walking with a back pack sprayer, Hercules claims.

Dr. Ogle also outlined the facts that the system eliminates premixing; the system applies thin as well as thick emulsions; a uniform swath is produced; and there is little washing away because the oil droplets provide better contact.

Follow Rules for Safety

With the commonly used phenoxy herbicides, such as 2,4-D, 2,4,5-T, and dalapon, there is little excuse for these materials to injure either persons or desirable plants when simple rules are followed, Dr. J. R. Orsenigo, Associate Horticulturist, of Florida's Everglades Experiment Station, Belle Glade, told the group.

Proper instruction in the use of protective clothing, and sensible applicating methods, prevent injury to personnel and the public. "Low toxicity herbicides are available for most situations, and there is little justification for using inorganic chemical, except in unique cases," Dr. Orsenigo advised the conference delegates.

A major reason for attending conferences such as the Hyacinth Control Society meeting is to find out how other workers do similar jobs. Delegates were pleased to hear William E. Wunderlich, Chief of the Aquatic Growth Control Section of the New Orleans Corps of Engineers District, describe portions of his control efforts in Louisiana.

"Excellent kills of waterhyacinths have been obtained using a 40% amine salt of 2,4-D applied as a ½% solution (by weight) in 100 gallons of water per acre. This figures out to a 4 lb. per

Society officers' attention was caught by a display at their June meeting. James D. Gorman (left) secretary-treasurer, Herbert J. Friedman, new vice-president, and John W. Woods (right) 1965 president pondered the merits of different hyacinth control methods presented.

acre application rate," Wunderlich calculated.

The Louisiana Engineers use a system where they draw chemical from its shipping container and water from the stream in which they're working through a self cleaning filter. Chemical is mixed and applied simultaneously. Applicating craft moves at a speed of 2 mph.

"Standard spray pumps are used. These are piston type with a capacity of 10 gallons per minute (gpm) which are capable of operating at 400 psi; working pressure is usually 350 psi," the engineer continued.

"High pressures help penetrate the vegetation and give good coverage to small plants which would be otherwise sheltered if the spray rained in from above. Our guns are mounted on swivels so that the recoil is absorbed and good aim can be maintained through the spray-day without overtaxing the stamina of the operator," Wunderlich revealed.

Sweeping Cone Gives Coverage

The New Orleans controller stated that the spray pattern is important and showed how his men achieved good coverage.

Experienced waterway navigator, Captain Noah Tilghman (right), Palatka, Florida, talked about pre-2,4-D era travel over hyacinth-infested waters with Gene Brown (left), U. S. Corps of Engineers public relations section, Jacksonville, and Julian J. Raynes, also of the Corps, from Atlanta, Georgia.

"We move the gun from side to side in such a manner to provide a cone in the horizontal plane. On one-half of the movement, the gun is directed in a straight line to strike the plants below the leaves and to penetrate through the stems to reach small plants. The return swing in the gun is more rapid and is at an elevation that will permit the material to fall on top of the upper leaves of the taller plants. Thus the pattern takes on the appearance of a cone with the lower sweep slightly flat and the upper portion curved," Wunderlich concluded.

The Hyacinth Control Society elected as president for 1965 John W. Woods, Chief, Fisheries Division, Florida Game and Fresh Water Fish Commission, Tallahassee. Former president Herbert J. Friedman, who is president of Southern Mill Creek Products' Co., Tampa, Fla., stepped into the vice presidential spot of the Society. James D. Gorman, director of the Hillsborough Mosquito Control District, Tampa, remains as secretary-treasurer. New editor of the annual Hyacinth Control Journal is T. Wayne Miller, director, Lee County Hyacinth Control District, Fort Myers, Fla.

New directors of the Society elected this year are Dr. Robert D. Blackburn, Crops Research Division, ARS, USDA, Fort Lauderdale, Fla., and A. C. White, technical specialist with California Chemical Co., Orlando, Fla.

Future plans of the Society will be announced through this magazine, *Weeds and Turf* was told.

Phelps Dodge Offers Two Books For Aquatic Weed Controllers

Two books on aquatic weed control are offered free to interested controllers by the Phelps Dodge Refining Corp., producers of copper sulfate.

One, *Controlling Plant and Animal Pests in Farm Ponds with Copper Sulfate*, is a 32-page book which tells how copper sulfate is used in small ponds. This book is beautifully illustrated with 19 color plates showing before and after treatment, applicators mixing and applying chemical, and some weed identification.

Tables which give proper application rates are also included. Brief discussions of control variables such as water hardness and temperature tell why precautions have to be taken with copper sulfate. Control of leeches and swimmer's itch organisms concludes this helpful book.

The second one, *The Use of Copper Sulfate in Control of Microscopic Organisms*, by Dr. Frank E. Hale, is a concisely prepared 44-page work, useful in part to aquatic applicators. Though directed to those concerned with pure drinking water, some organisms, namely microscopic algae, are "weed" pests in their own right. After describing the "sight and smell" characteristics of the various tiny plants and animals, the author discusses copper sulfate, how it kills, and how it is applied.

In addition to rate tables, there are 48 plates showing most common microscopic aquatic organisms in actual microscopic view. Not all of the organisms are of interest to aquatic weed controllers, but there are enough to make the book valuable.

Both books may be obtained free from the Phelps Dodge Refining Corp., 300 Park Ave., New York, N. Y. 10022.

Next month in W&T

How to Use Dormant Cane Broadcast

Meeting Dates

Wisconsin Park and Recreation Society Meeting, McKay Nursery, Waterloo, Wis., Aug. 13.

Rutgers University Turfgrass Field Days, New Brunswick, N. J.: Lawn and Utility Turf, Aug. 12; Golf and Fine Turf, Aug. 13.

International Shade Tree Conference, Shamrock Hilton Hotel, Houston, Tex., August 15-21.

Iowa Nurserymen's Assn. Meeting, Town House, Cedar Rapids, Iowa, Aug. 20-21.

Florida Turf-Grass Assn. 12th Annual Turf Conference, Gainesville, Aug. 25-27.

National Agricultural Chemicals Assn. Annual Convention, The Greenbrier, White Sulphur Springs, W.Va., Sept. 8-11.

Alabama-North Florida 5th Annual Turfgrass Short Course, Auburn Univ., Auburn, Ala., Sept. 10-11.

Canadian Agricultural Chemicals Assn. Annual Meeting, Chateau Laurier, Ottawa, Quebec, Sept. 13-16.

Midwest Regional Turf Foundation Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.

Ohio Agricultural Experiment Station, Lawn and Ornamentals Day, Columbus, Ohio, Sept. 15.

Illinois Turfgrass Foundation Field Day, University of Illinois, Urbana, Sept. 18.

Society of American Foresters Annual Meeting, Hilton Hotel Denver, Colo., Sept. 27-30.

Mississippi Nurserymen's Assn. Meeting, Hotel Heidelberg, Jackson, Oct. 2-3.

Central Plains Turf Grass Foundation Meeting, Umberger Hall, Kansas State University, Manhattan, Oct. 21-23.

Washington State Weed Conference, Chinook Motel and Tower, Yakima, Nov. 2-3.

National Fertilizer Solutions Assn. Meeting, Statler-Hilton Hotel, Dallas, Texas, Nov. 3-5.

National Weed Committee of Canada, Eastern Section Meeting, Quebec City, Nov. 5-6.

Northwest Chemical Applicators Assn. Annual Conference, Chinook Hotel, Yakima, Wash., Nov. 30-Dec. 1.

National Weed Committee of Canada, Western Section Meeting, Royal Alexandria Hotel, Winnipeg, Dec. 1-3.

North Central Weed Conference, Inc., Meeting, Kellogg Center, East Lansing, Mich., Dec. 14-16.

Ohio Chapter-ISTC Proposes More Ag Station Small Tree Evaluation

There is a need for more knowledge about small flowering and ornamental street trees, members of the Ohio Chapter of the International Shade Tree Conference resolved at their summer meeting, July 8, at the Kingwood Center, Mansfield.

Dr. L. C. Chadwick, horticulture professor of Ohio State University, Columbus, and secretary-treasurer of the Shade Tree Conference, presented the resolution and the reasons the Ohio Chapter proposed them.

It is widely known that large street trees, such as American elm and silver maple, commonly planted in the past, have proved susceptible to diseases, such as the destructive Dutch elm disease. Suggestions for substitute trees, the Chinese elm, for instance, have drawbacks also, from a power line maintenance standpoint. For these reasons, the Ohio ISTC feels that more species and varieties of small flowering and ornamental street trees need to be selected and evaluated for future city planting.

The Chapter has resolved to approach the Ohio Agricultural Experiment Station and ask for additional land on which to test, over a ten-year period or longer, selected trees for hardiness, disease resistance, and aesthetic advantages, such as color, shape, blossom, etc.

Seek Power Company Aid

Besides cooperation from the Experiment Station and the State University, the Conference Chapter hopes to enlist aid of state power companies and power company associations, because these groups have a prime interest in promoting smaller trees for streetside planting.

The vigorous Ohio Chapter has volunteered to perform the professional tasks of planting and maintaining trees in the evaluation plots, and hopes the Experiment Station will carry out the academic job of diagnosis and evaluation. At present this monumental proposal is in the discussion stage.

A second forward-looking resolution that the Chapter will present to the Extension Service of the State University system is a proposal for increased extension attention to the urban and suburban desire for knowledge about ornamental horticulture, floriculture, and landscape design. Reasoning behind this proposal is the increased move to suburbia and the request for knowledge on the parts of both individual citizens and the arborist, nursery, and landscaping trades.

Tree Safety Committee Named

Other news from the summer meeting includes the announcement that a safety committee has been appointed, consisting of representatives of major tree service companies, in close cooperation with the National Arborist Association, to help cut down on industry accidents. This move came when the Ohio Division of Industrial Safety and Hygiene volunteered the services of an expert to the industry provided the industry first established a sturdy base from which to launch a broad safety program.

This offered help is an upshot of the Ohio Safety Congress, which met earlier this year, and included, for the first time in its history, an emphasis on tree service safety.

After the business meeting, delegates toured the grounds of Mansfield's Kingwood Center, a civic-oriented cultural garden. Many new ideas were taken home from this and other tours.

Poly Film Stops Weeds

One particular development of the Center, which landscapers and nurserymen were interested in, was the use of black 1½-mil polyethylene plastic sheets as weed preventers in mixed annual flower beds. As Center director, Dr. R. C. Allen, explained the procedure, the plastic is laid over prepared flower beds and either a top dressing or broken, aged corncobs are spread over to obscure the plastic from view. Then gardeners punch holes in the plastic and insert the flowers into the soil. Very few weeds enter the flower beds, although quackgrass is able to penetrate the plastic (it will not penetrate a 6-mil sheet).

Total costs are approximately the same for herbicides and the plastic method, Dr. Allen dis-

A chlorotic silver maple twig was examined by Dr. Paul Tilford (left), Executive Secretary, National Arborist Association, and Dr. L. C. Chadwick, Secretary-Treasurer, International Shade Tree Conference, during the Ohio Chapter meeting. Delegates traditionally bring their most recent problems to these experts for counsel.

closed, but the extra advantage which the Center appreciates is that no concern for different tolerances of flowering annuals to herbicides is needed.

The group of 110 delegates then toured via car caravan a local landscaping job, a nearby landscape nursery, and the plant of the F. E. Myers & Bro. Company, sprayer manufacturers, in Ashland, Ohio.

Penn State Finds New Turf Disease, Called Fusarium Blight

A new turfgrass disease, called the "most troublesome in northeastern U. S.," has been isolated and identified by researchers at the Pennslyvania State University Department of Plant Pathology and reported by Dr. Houston B. Couch, Associate Professor, in the Spring-Summer 1964 edition of the Agricultural Experiment Station Bulletin.

When the odd disease, now called Fusarium blight, was first found in 1959, Dr. Couch relates, it could not be controlled by any of the commonly used fungicides. Researchers looked for the disease the following year and found it prevalent in eastern New York, New Jersey, Maryland, and Delaware, as well as Pennsylvania.

According to Dr. Couch, "affected turfgrass stands first show light-green areas that are either circular, crescent-shaped, or streaked. Initially, these discolored sections of grass range from 2 inches to 1 foot in diameter. Within a few days, they may enlarge to a total breadth of 2 feet or more.

"As the disease progresses, the color of the grass fades to a dull tan, and eventually to a light straw color. In the final stages, distinct streaks and uniformly blighted circular patches of grass will be scattered throughout the lawn. Also, centers of green grass, apparently healthy plants, occur in circles of dead grass and have taken the name 'frogeye.' The 'frogeye' pattern is characteristic and a key field diagnostic feature.",

This new disease shows one of the clearest relationships between disease susceptibility and fertility. Bluegrass, bentgrass, and red fescue grown under high nitrogen fertility or deficient calcium levels were far more susceptible than those grown under normal balanced nutrition, the report continues.

The pathogen is the fungus, *Fusarium roseum*, the same organism which causes stalk rot of corn, and carnation stem rot. *Fusarium* can cause severe foliar blighting of turf in only 72 hours when temperatures are favorable. Bents and red fescues are commonly attacked at 75-95 degrees F. *Fusarium* found on Merion Kentucky bluegrass is most active at 85 degrees F. In its most aggressive phase, Dr. Couch describes, the pathogen