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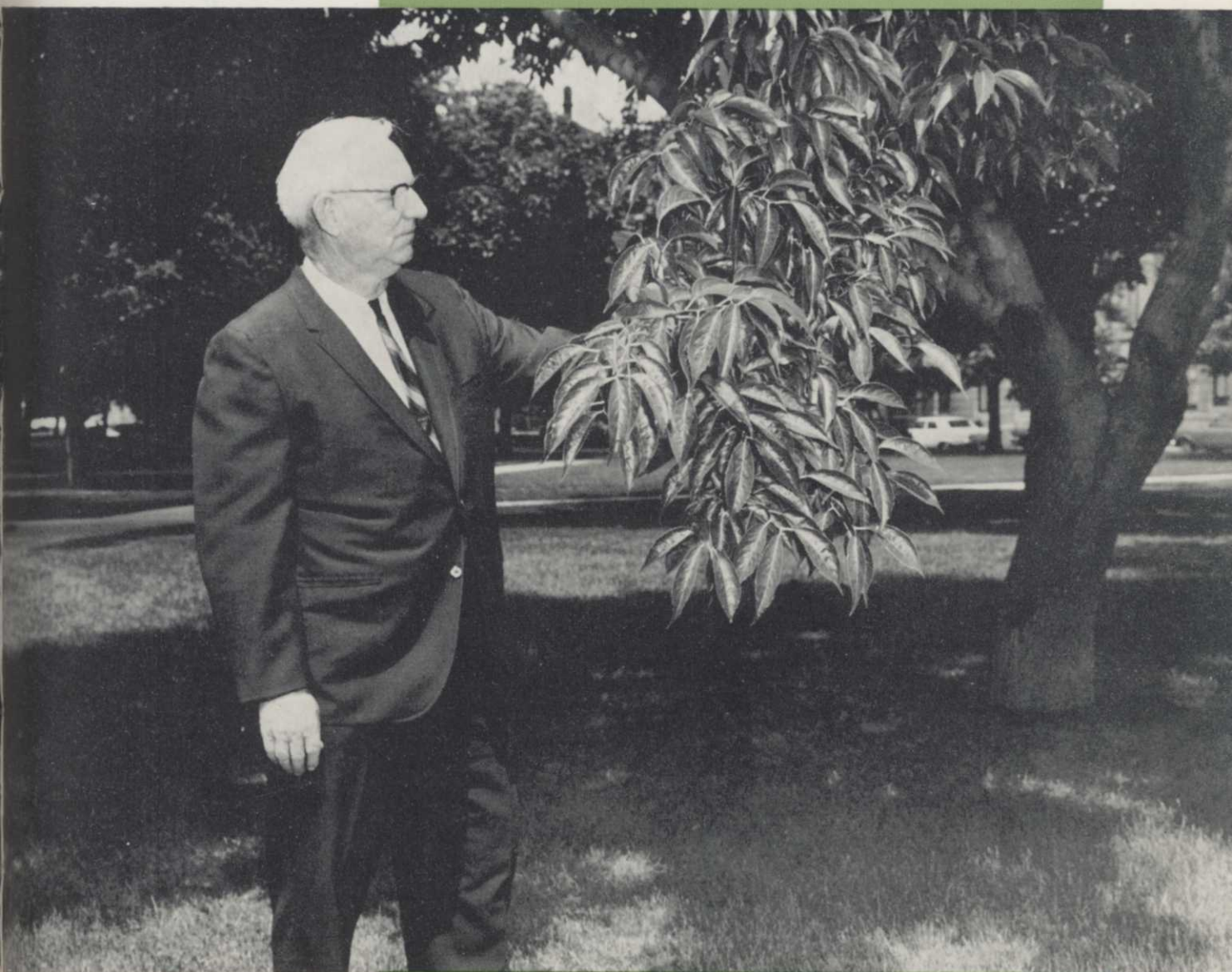


The 43rd ISTC  
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# WEEDS TREES and TURF

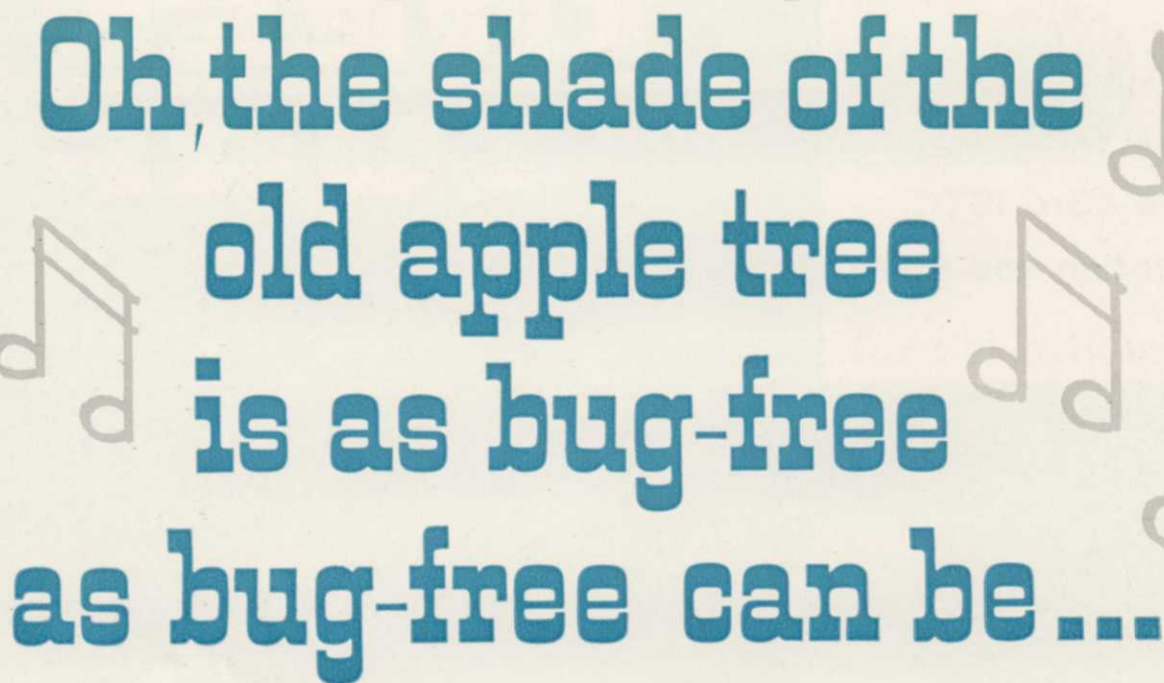
A TRADE MAGAZINES PUBLICATION

August 1967



**Dr. L. C. Chadwick**, executive director of the International Shade Tree Conference and head of the Division of Floriculture and Ornamental Horticulture at The Ohio State University, Columbus, O., examines *Eucommia* tree on campus. Dr. Chadwick retires from his University position this coming month. See page 26.

Monthly magazine of methods, chemicals and  
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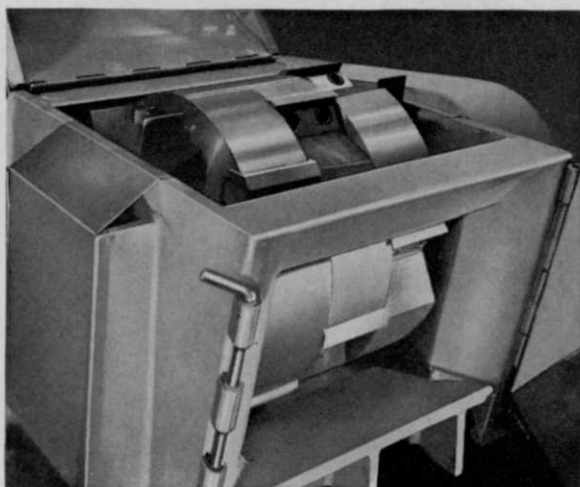
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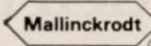
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# WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

August 1967  
 Volume 6, No. 8

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## Alert Your Customers

If you've been keeping up on the local news in your area, you know that the fly-by-night service artists are still in business. Not only are they operating, but it's your business image which suffers when they reap their cash award and move on.

Maybe now is a good time to alert your customers to the shoddy operation which promises much but cannot do a proficient job at the cut rate which attracts the business in the first place. You can use your local advertising outlets or your own direct mail piece. Perhaps you can handle a joint exposé promotion in cooperation with other legitimate operators.

Point out the guarantee of prompt service and quality work customers can expect from year-round, local businesses such as your own. Use examples of complaints which have made the local newspaper, radio, or TV outlets. Check on others from your Better Business Bureau. Likely, you can point to some of your own experiences where you have been called to correct a job.

Above all, point out the unique nature of service to vegetation, whether it be chemical applications, tree care, or other types of vegetation control. Results depend on time, whether a good or poor job is done. No customer can examine the chemical and judge its value. Nor can the customer judge the tree care job until it is done. In any case,

there is no second guessing. The fast buck artist has collected and moved on. By contrast, the local operator will still be in business, and not only will he be able but will expect to make the job right.

Warn your customers that vegetation maintenance and control practices vary from area to area. Local full-time operators know their area. They know the specific insects and diseases and the most effective related services to benefit the customer. Transient operators are unable to provide the experienced judgment needed for many local problems.

Despite the fact that local news media readily publicize the gyp operator, such transients still find work. Perhaps local operators need to speak with more force and do their promotion as a group. Customers need to be made to realize that shoddy tree care work cannot always be repaired, and when it can, it takes time. Shoddy spraying can wipe out years of landscaping effort for which the customer will have no recourse.

WEEDS TREES AND TURF is the national monthly magazine of urban/industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, sod growers, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

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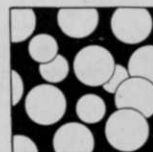


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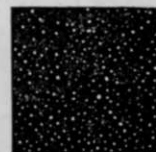
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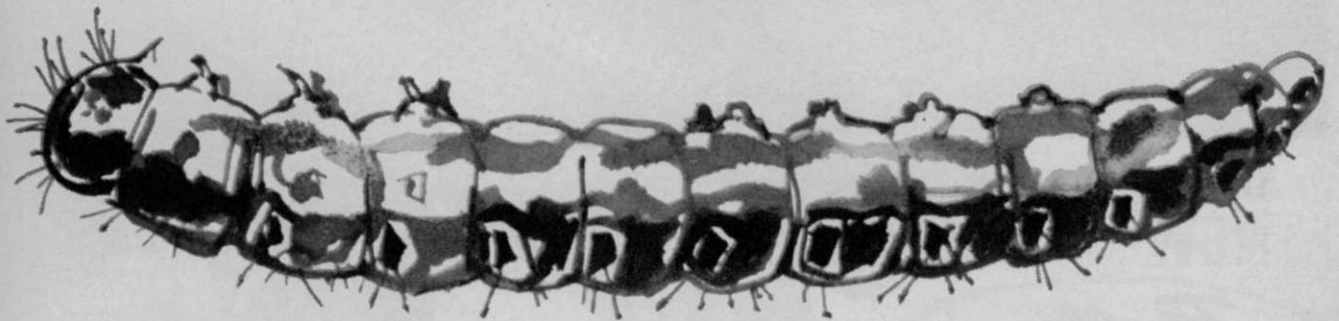
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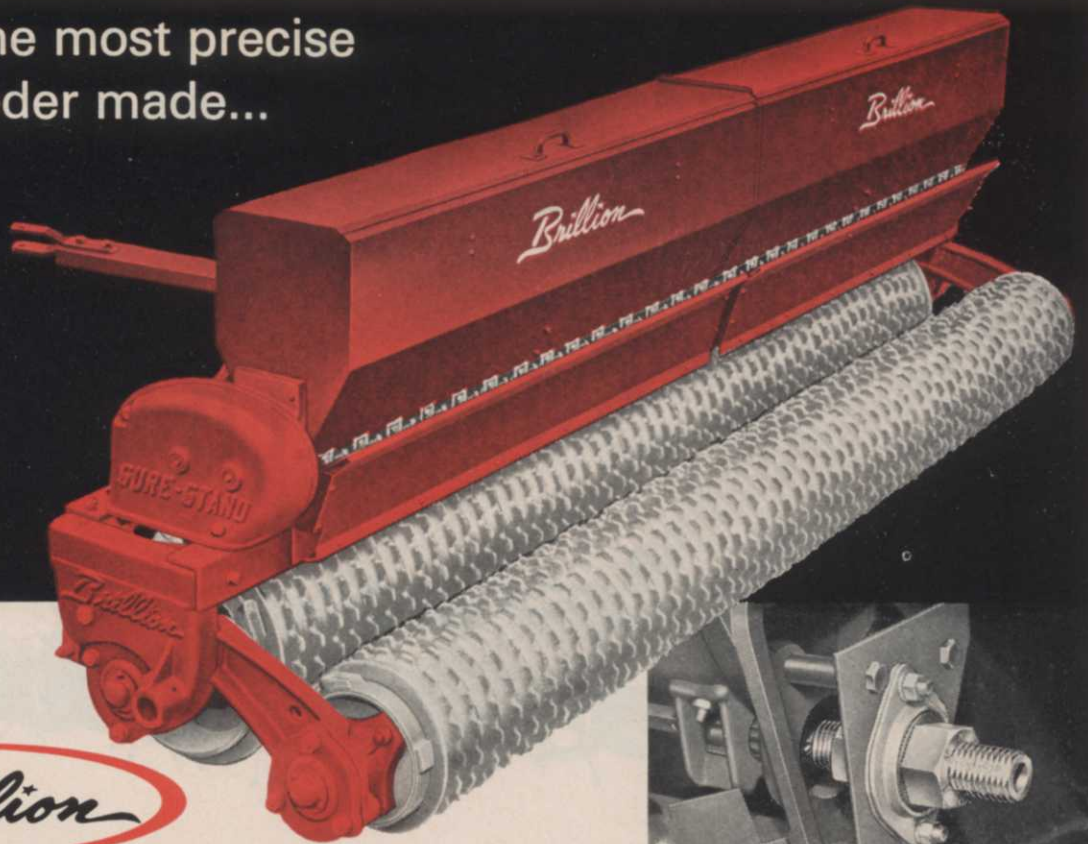
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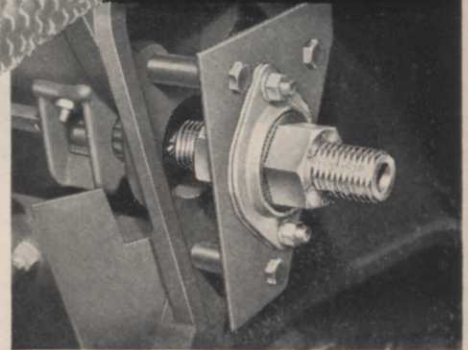


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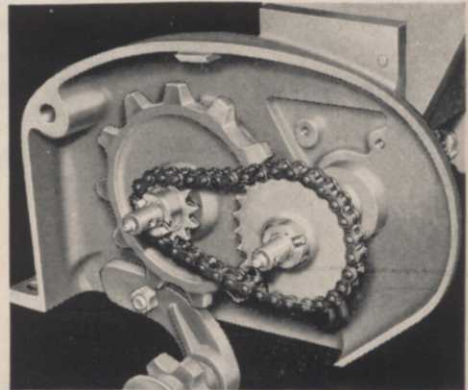
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# Select Street and Lawn Trees

*for site adaptability,  
minimum maintenance, and  
resistance to pollution,  
insects and disease*

PEOPLE today expect beauty around them. Urban workers and dwellers tend to take for granted the greenery which is built into busy city streets and suburban areas for their comfort and either conscious or unconscious enjoyment.

Credit for reducing glare and softening hard building lines, breaking up the suburban landscapes, providing shade and multiple other uses must go to professional arborists and landscapers who understand the problem. Street and lawn trees often have to withstand pollution, lack of moisture, incredible summer heat, and generally adapt to artificial conditions. At the same time, the tree must have the size and proportion to contribute to its surroundings. It must stay within its territorial bounds, including root system, trunk, and canopy. Above all, the city tree must thrive. This is expected despite pruning to avoid overhead lines or other obstacles, lack of normal humus

**Golden-rain Tree, *Koelreuteria paniculata*.** Age, 15 years from seed; height 13.5 feet; diameter, 7.7 inches; crown spread, 16 feet. Located on OARDC campus, Gourley Hall.



**Sweet Gum, *Liquidambar styraciflua*.** Age, 16 years from seed; height, 21 feet; diameter, 4 inches; crown spread, 13 feet. Located on OARDC campus, Williams Hall.





**Texas Red Oak, *Quercus shumardii* var. *texana*.** Age, 19 years from seed; height, 31 feet; diameter, 12.1 inches; crown spread, 32 feet. Located on OARDC campus, Gourley Hall.



**Moraine Honey Locust, *Gleditsia triacanthos inermis* Moraine.** Plant patent 836. Age, 19 years; height, 32 feet; diameter, 7.3 inches; crown spread, 30 feet. Located on OARDC campus, Gourley Hall.

and mulch, and disrupted root areas.

No single tree can meet the many needs of a city. Trees of many forms and sizes are needed, some to beautify homes and parks, others for streets, and still others for highways leading into the central city. In recent years, the tendency has been to promote small trees which do not exceed 40' in height at maturity. The so-called forest giants are discounted because they interfere with walks and other city conveniences. However, when there is enough space, such trees provide more shade and sheer beauty than many of the smaller trees.

#### **Planting Site Governs Selection**

Naturally, the planting site must govern the selection of trees. Smaller species are recommended for planting under wires and to fit specific areas. Yet there are other factors equally important in selecting trees for yard or street. Such characteristics as form, hardiness, longevity, resistance to insects and disease, and soil requirements are mandatory.

A few trees, planted with these

factors in mind, have performed well at the Ohio Agricultural Research and Development Center for a period of years (see illustrations). These include selections of thornless honey

locust, Texas red oak, pin oak, sweet gum, ginkgo, little-leaf linden, and Washington hawthorn. Others of the newer cultivars of maples, oaks, lindens, and flowering trees could well be in-



**Washington Hawthorn, *Crataegus phaenopyrum*.** Age, 19 years from seed; height, 16 feet; diameter, 5.1 inches; crown spread, 16 feet. Located on OARDC campus, Gourley Hall.



**Little-leaf European Linden, *Tilia cordata*.** Age, 13 years from seed; height, 26 feet; diameter 8.4 inches; crown spread, 19 feet. Located on OARDC campus, Maintenance building.





**Pin Oak, *Quercus palustris*.** Age, 17 years from seed; height, 37 feet; diameter 11.8 inches; crown spread, 40 feet. Located on OARDC campus, Gerlaugh Hall.

cluded. However, some of these require further testing according to Dr. O. D. Diller. The elms, silver maple, catalpa, mulberry, and the poplars are not recommended.

Equally as important as size or scope of the mature tree is hardiness. Ability to withstand insects and disease and adapt to the ex-

isting environment is a strong measure of any tree's worth. City planners are increasingly concerned that trees be easy to maintain and service. Increased labor costs dictate that trees require little in the way of pruning or care beyond the city's regular fertility and spraying program.

Thus, trees must be selected



**Ginkgo, *Ginkgo biloba*.** Age, 58 years from seed; height, 48 feet; diameter, 22.9 inches; crown spread, 48 feet. Female tree, though fruitless male trees are preferred.

for their natural ability to fit the specific elevation, air pollutants, climate, and either available moisture or the moisture which can be made available to the tree. Trees for street use must also be free from odor such as that of the fruit from the female ginkgo. They cannot possess root systems which clog sewerlines, a characteristic of the Lombardy poplars. Nor can they be readily susceptible to disease such as the canker stain and anthracnose of sycamores. Problems throughout the country with Dutch elm disease point up the extreme hazard and expense of losing large inventories of trees.

Public moneys are normally responsible for a large percentage of any major city's trees. Few cities provide more than the nominal percentage funds desired by the city forester or other planners. Thus, smaller than desired trees or fewer trees may be used. Because of these factors, it is even more necessary that careful variety selection be made for new plantings. Competent landscape architects and arborists are mandatory during planning. Proper planting and follow-up care by trained personnel can then insure that trees live and provide the beauty and use intended.

By way of summary, remember that people expect beauty around them, though they may not be aware that trees reduce glare and add to their comfort. Trees must be selected which can adapt to the often unnatural site as well as being able to resist pollution, insects and disease. More important, they must fit into the city's regular program of maintenance. Fortunately, today we find many such trees available.

*A WTT staff report based on an interview with Dr. O. D. Diller, curator of Secrest Arboretum, a 115-acre development now established as an independent unit of the Ohio Agricultural Research and Development Center at Wooster, Ohio. Dr. Diller served as chairman of the Center's forestry department from 1950 to 1965, serving on the Center's staff since 1937.*



# Can You Spot

# Evergreen Diseases

BY DONALD F. SCHOENEWEISS

Assistant Plant Pathologist  
Illinois Natural History Survey, Urbana, Illinois

EVERGREENS have long been considered relatively free of insect and disease problems as compared with shade and ornamental trees and shrubs. Low maintenance costs in the nursery as well as in the permanent planting site have provided a positive stimulus leading to the extensive, and at times overenthusiastic, use of evergreen varieties in landscape plantings. Intensive cultivation of large numbers of evergreens over the past 20 to 30 years, however, has resulted in a tremendous increase in diseases and insect pests. Measures to control them are frequently required to realize a profit on evergreens in the nursery, landscaping and arborist industries.

Although research on control of pests has lagged behind both production of evergreens and introduction of new varieties and selections, effective control measures have been worked out for many evergreen pests and should be employed wherever possible. The effective use of proven pest control practices will not only benefit the plants being injured but will aid in preventing the buildup of disease organisms and insect populations. This, in turn, will help prevent the spread of these pests to other potential host plants. Control recommendations for many plant pests may be obtained from state

and federal research organizations and are usually based on scientific experimentation. Such recommendations, if followed closely, will give better results in the long run than hit-or-miss measures suggested by the untrained or poorly informed.

Because of similarities in symptoms and control measures, diseases of evergreens may be separated into four categories: leaf or needle diseases, twig and stem diseases, root diseases, and diseases or injuries not resulting from disease-causing organisms. Control practices for specific diseases within each category are usually quite similar, and some of the practices are effective on several diseases within the group.

Many needle diseases of evergreens are common and widely distributed; others rarely occur except when climatic conditions are optimum for disease development. Some cause little damage and are of interest only on specimen plants, whereas others can result in severe injury and loss of desirable plants. Nurserymen, landscapers, and arborists alike should become familiar with most of the common needle diseases and their control measures. Those evergreen diseases which occur most frequently in the Midwest will be discussed in this paper.

Cedar-apple and cedar-haw-

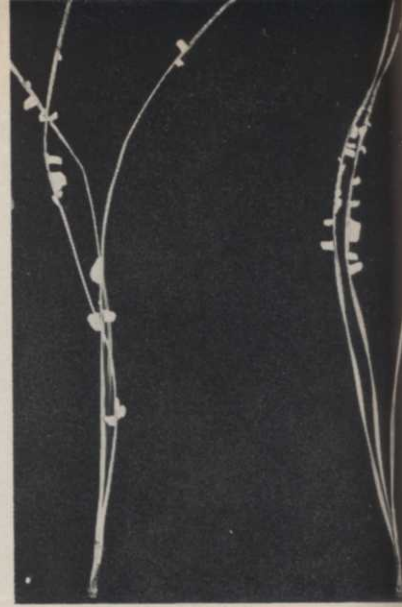
thorn rust are two of the most prevalent and widespread evergreen diseases in the Midwest. Cedar-quince rust also occurs, but is less common.

## Woody Galls Formed

The cedar rust fungi invade the needles of susceptible juniper varieties. As the disease progresses, small to large, green, woody galls are formed by the cedar-apple and cedar-hawthorn rust fungi, and pustules are formed on stems by the cedar-quince rust fungus. Occasionally the galls or pustules enlarge and stem tissues are invaded by the fungus to the point where the stem is girdled. When this happens, the portion of the branch extending outward from the girdle dies.

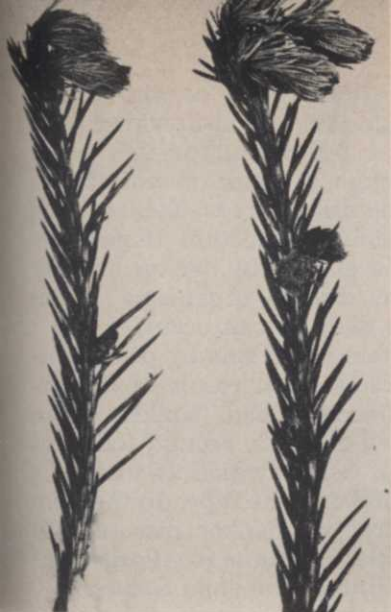
During moist periods in the spring, bright orange, sticky spore horns form on the galls, giving them a striking, unsightly appearance. When the spore horns dry up, masses of spores are released and may be blown to alternate pomaceous hosts, such as susceptible crabs and hawthorns, causing leaf spot and defoliation. Alternate infections of evergreen and pomaceous hosts are necessary for the cedar rust fungi to complete their life cycle.

Several measures are useful in controlling the cedar rust fungi. One simple but effective meas-



Pustules on needles of red pine caused by the needle rust fungus *Coleosporium*.





**Diplodia tip blight** symptoms on young shoots of Norway spruce.



**Lophodermium needle cast fungus** fructing bodies on needles of *Pinus contorta*.



**White pine blister rust canker** caused by the fungus *Cronartium ribicola*.

ure is to pick or prune the galls or pustules from affected evergreens in late fall or early spring before the spore horns form. This will not only get rid of the unsightly galls, but will prevent spread of the rust fungi to the alternate hosts. If many diseased plants are involved, as in nursery or large juniper plantings, or if this method is impractical for other reasons, affected plants may be sprayed with cycloheximide (Acti-dione as Acti-Spray tablets) following the recommendations on the package. One spray should be applied in the spring, usually sometime in May, when spore horns are beginning to swell on the galls and are about  $\frac{1}{8}$  inch long. This spray prevents spore horn formation and consequent spread to the alternate hosts.

Since the presence of both hosts is required for the cedar rust fungi to complete their life cycle, the best control measure for rust galls on juniper is to remove susceptible crabs and hawthorns in the vicinity. This practice, unfortunately, is seldom feasible, particularly in nurseries and extensive landscape plantings.

The next best procedure is to plant juniper varieties resistant to the rust fungi. Particular attention should be given when selecting varieties of *Juniperus virginiana*, since 21 varieties or

forms have been found susceptible to cedar-apple or cedar-hawthorn rust or both, and 15 forms are reported resistant to one or both fungi. *Juniperus scopulorum* and all its forms and varieties are reported susceptible to cedar-apple rust and should be planted only if other juniper species are not available or not desirable for some reason. A list of resistant and susceptible juniper varieties is available from the Illinois Natural History Survey on request.

#### Spraying Is Practical

If neither removal of the alternate hosts nor use of resistant varieties is practical, susceptible junipers may be protected from rust infection by three sprays applied in July and August at 3-week intervals using 2 pounds of ferbam in 100 gallons of water.

Several fungi may cause needle blights of evergreens, especially if a plant is weakened by drought, winter injury, transplanting shock, a poorly drained site, or low nutrition. Most healthy evergreens, such as spruce, fir, and pine, can be protected from needle blights by applying several sprays in the spring using one of the organic mercury fungicides or a copper-containing fungicide such as Bordeaux mixture.

One of the needle blight fungi, *Scirrhia pini* (*Dothistroma pini*),

is of considerable importance, since infected trees often show extensive defoliation and die-back and occasionally die. This disease may affect several species of pine but is most severe on *Pinus nigra* (Austrian pine), *P. ponderosa* (Ponderosa pine), and *P. thunbergi* (Japanese black pine) in Illinois. Yellow to tan spots appear on 1- to 2- and 3-year-old needles in late fall or early spring. By April or early May in Illinois, fructing bodies of the fungus appear on the spots. Often a band is formed around affected needles and the portion of the needle beyond the band dies. On severely diseased trees all but the current season's needles may defoliate, resulting in weakened trees which may succumb to winter injury or other causes. The disease is most severe on pines growing in sheltered locations, groves, or windbreaks. For this reason one of the recommended controls is to thin out groves and provide better air circulation which often reduces the severity of damage.

Although spraying of both diseased and healthy needles in the spring with a copper-containing fungicide such as Bordeaux mixture has been reported to give good results, *Scirrhia* or *Dothistroma* needle blight is difficult to control, and further work on the effectiveness of fungicide spray programs is needed. Con-





**Cedar-apple rust gall** on twig of red cedar before spore horn formation has occurred.



**Scirrhia or Dothistroma needle blight** on 1-year-old needles of Austrian pine.

siderable variation among individual Austrian pines in susceptibility to the disease has been observed in Illinois. Resistant varieties or clones may someday provide the best solution to control of this disease.

A large group of fungi may cause defoliation or needle cast on evergreens. Needle casts are not usually of enough consequence to warrant control measures, but under optimum conditions for disease development a fungus such as *Lophodermium pinastri* can cause considerable damage. Control measures are the same as for needle blights and consist of spraying in the spring with organic mercuries or copper-containing fungicides.

Needle rust of pine, usually found on *Pinus resinosa* (red pine), occurs commonly in the Midwest. White to orange pustules, fruiting bodies of the fungus *Coleosporium*, appear on infected needles in the spring and can result in stunting and defoliation in young seedlings. However, the disease is seldom of any importance on older plants, and therefore control measures are not often recommended. Control can be achieved by removing all goldenrod and asters in the area, which serve as alternate hosts for the rust fungus.

The fungus *Botrytis cinerea* may cause a mold or blight on foliage and succulent stems of

evergreens under conditions of high humidity. Seedlings and cuttings in the greenhouse are often attacked by this fungus, but *Botrytis* mold on plants in the field is rare and usually occurs only during periods of extremely wet weather. Control has been achieved through the use of copper fungicides, but a new fungicide, Botran, may prove to be much more effective. Weekly spraying of foliage with Botran as soon as *Botrytis* blight appears should give satisfactory control.

#### Mildew Fungi Are Regular

Mildew fungi appear frequently on the foliage of evergreens, particularly on the broad-leaved plants such as Euonymus and holly. Disease severity, which varies from year to year, depends on weather conditions. In addition to an unattractive appearance, mildew can cause leaf curling, defoliation, and general weakening of infected tissues, resulting in increased dieback due to severe weather conditions. Control measures consist of spraying at 10-day intervals with Karathane, sulfur, or cycloheximide (Acti-dione PM), beginning when mildew first appears on the foliage.

Organisms causing twig and stem diseases on evergreens are often found on plants low in vigor or weakened in some way. Many disease organisms found

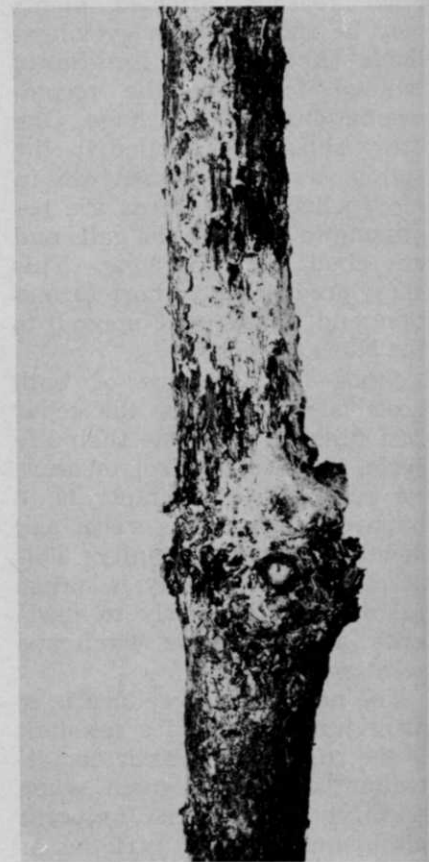
on stems, such as the canker fungi, are wound-invading parasites which enter the plant through a break or wound and, if the tissues are weakened, cause a localized infection. If stems become girdled by canker or other stem disease organisms, extensive dieback can occur.

Stem infections by disease organisms often result in the formation of dead, sunken areas, called cankers, around the point of invasion, which is usually a wound of some type. In the more destructive canker diseases, the cankers continue to enlarge until girdling of the stem occurs.

A common example is *Cytospora* canker of spruce. Early symptoms appear as browning and defoliation of needles on affected branches. In most cases girdling cankers form, accompanied by the exudation of pitch, and branches die, beginning with those nearest the ground and progressing slowly upward. Control may be achieved by pruning out cankered branches and by maintaining plants in a vigorous growing condition by proper pruning, watering, and fertilization.

(Continued on page 30)

**Cytospora canker** on Colorado blue spruce showing typical exudation of pitch.







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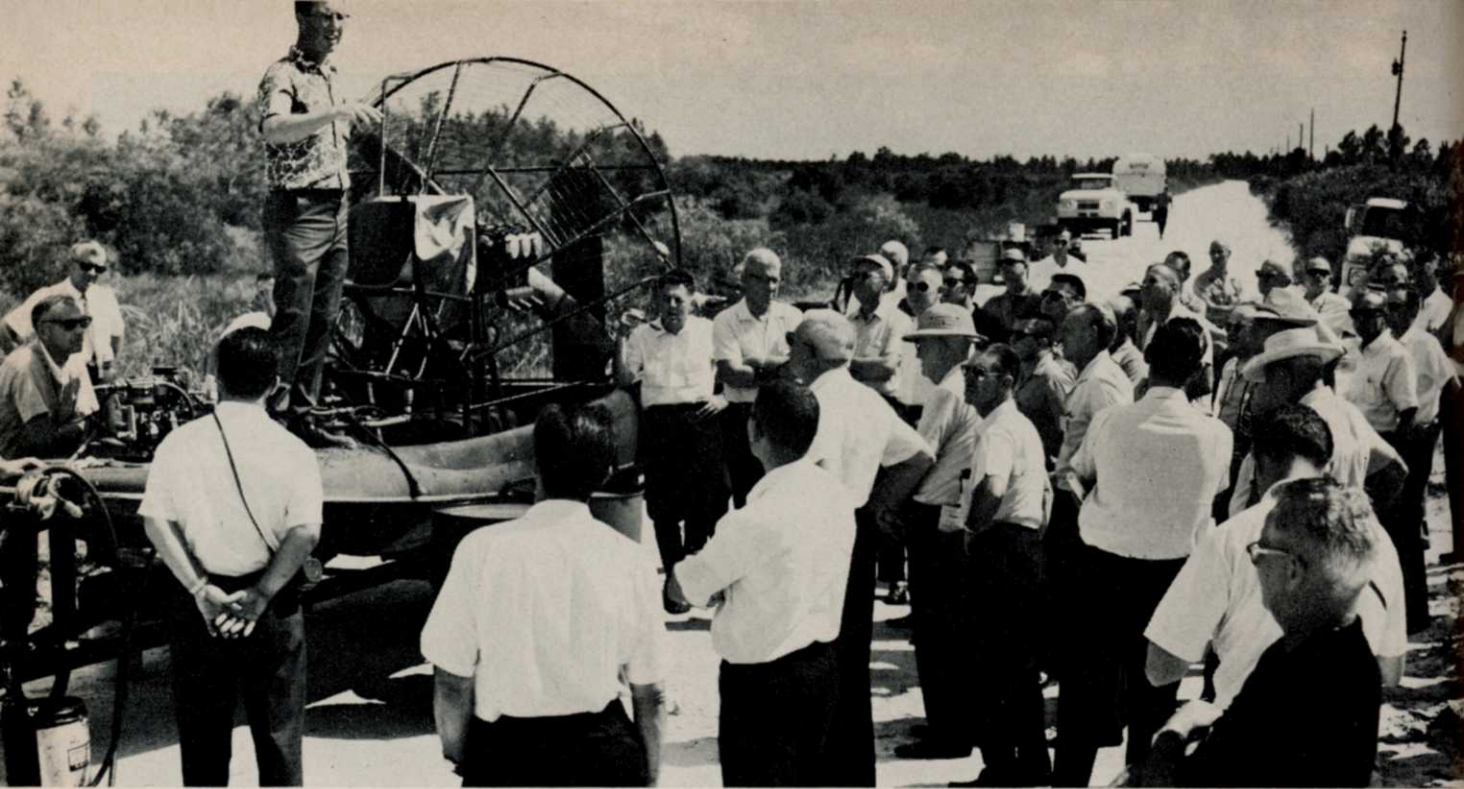
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**Dr. Lyle W. Weldon, atop air boat,** research agronomist at Agricultural Research Service, USDA, Ft. Lauderdale, Fla., gets Society field

demonstration underway. Some 150 members of the Society registered for the 1967 annual meeting.

# Aquatic Vegetation Control

*a major segment  
of the industry*

**Earl Ogle, Hercules, Inc.,** Wilmington, Del., demonstrated Hercules equipment for testing consistency of invert spray materials during field demonstration at Society's 7th annual meeting.



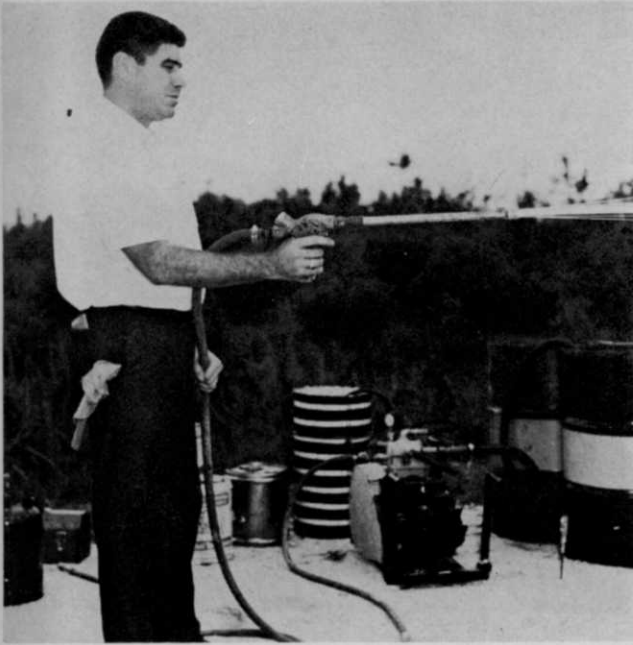
*A WTT staff report on the 7th annual meeting of The Hyacinth Control Society, an organization dedicated to control of all noxious aquatic weeds. Members pool their experience and research in an exchange of information, aimed particularly at the applicator level.*

Aquatic weed control promises to become more complex. Problem areas increase as greater segments of the nation's population seek out and use inland water, whether lakes, canals or regular streams. Homebuilding and commercial use of inland water causes a buildup of pollution which in effect fertilizes bodies of water to the extent that they become natural incubators for weed growth. The usual result is that aquatic weeds limit

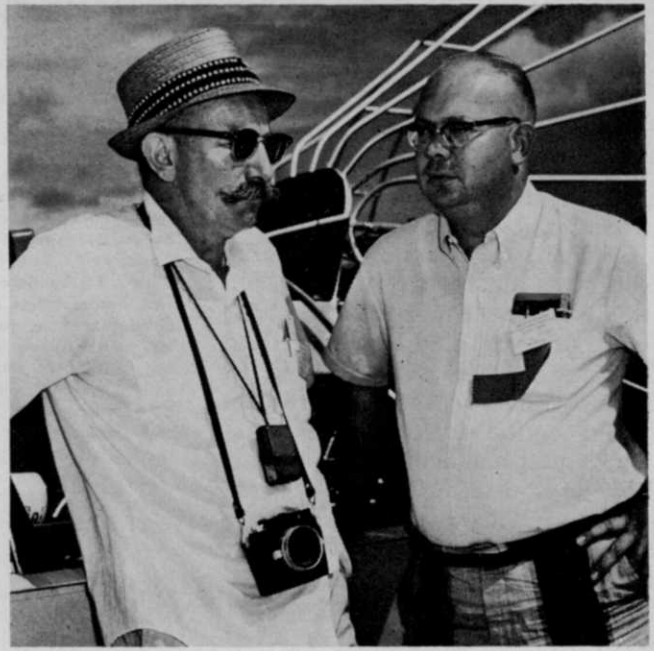
recreational, commercial, and public use of both natural and artificial water areas.

A good example of how quick noxious aquatic weeds can become a problem is found in the Panama Canal. Problems there began only about 10 years ago at a time when only hyacinths and some aquatic grasses were evident. These did not become alarming until about 5 years ago when many areas suddenly became choked with Elodea and





**Stull Chemical Company's Bifluid System** as an aquatic weed control technique is being demonstrated at field session of Society meeting by Bob Burgdorff, sales representative of Stull, Houston, Tex. On the program Burgdorff related Stull's pioneer work with this new concept of vegetation control.



**John Gallagher, left, and James D. Gorman** discuss aquatic weed problems during field demonstration of Hyacinth Control Society annual meeting. Gallagher is aquatic weed research specialist, Amchem Products, Inc., Ambler, Penna., and Gorman, Society president, is director of the Hillsborough County mosquito control unit, Tampa, Fla.

other varieties of submersed weeds. Mechanical methods of clearing choked areas worked for a time but, according to Julian S. Hearne, chief of the Dredging Division of the Panama Canal Co., who reported at the recent annual meeting of the Hyacinth Control Society at Ft. Myers, Fla., the need to rely on chemicals was soon apparent. Copper sulfate experiments were started in 1964 and produced good results. It was used in crystal form so that it would settle to the bottom and attack the root system of the plants. Later, in May 1966, Elodea was almost completely cleared by use of copper sulfate. However, because of the expense involved on the massive expanse of the Canal, Hearne said that experiments were started with other chemicals to seek methods of reducing costs. Most of the areas tested were plagued with about 90% Elodea, 8% coontail, and 2% water hyacinth and marginal grasses.

Results varied with concentrations of chemicals used, Hearne reported, but were generally good. For example, Hydrothol 191 used in liquid form at concentrations of 1.5 to 3 ppmw showed a remarkable disintegra-

tion of vegetation, and within 3 weeks plots were virtually free of all vegetation. No fish kill was evident. By contrast, a similar concentration of Hydrothol 191 in granular form produced a very slow effect with areas adjacent to spots where the granules fell having a very healthy effect.

Copper sulfate plus Diquat at

concentrations of 1 to 2 ppmw of each give kills ranging from 80% to 100%. Diquat alone at 1 to 2 ppmw concentrations gave 80% to 85% kills after 3 weeks. Copper sulfate crystals at 5 to 20 ppmw concentrations produced 90% to 100% breakup and decomposition of Elodea with no new growth showing after 3 weeks. Karmek at a concentra-

**Zeb C. Grant, vice-president** of the Hyacinth Control Society and director of operations and maintenance of the Florida Flood Control District at West Palm Beach, Fla., left; **Charles J. Fox**, technical representative of Hercules, Charlotte, N. C., center; and **William Dryden**, commissioner of the Lee County Hyacinth Control District at Ft. Myers, Fla., and a past president of the Society as is Grant, discuss program just prior to opening session.



tion of 3 pounds per acre foot gave a 10% reduction in weeds after 3 weeks; at 15 pounds, a 35% reduction.

Problems in aquatic control were reviewed for the record 150 registrants at an annual Society meeting by President James D. Gorman, director of the Hillsborough County, Fla., mosquito control unit. Among the most far reaching, he said, was a ruling by the Florida State Board of Health that no pesticide formulations containing 2,4-D, dalapon or Diquat had been registered for use in sources of potable water supply. This problem is being studied by a number of federal, state, and private agencies to determine the information required for registration of 2,4-D formulations. A report is expected shortly. Gorman also said that a bill had been introduced into the US Senate to prohibit importation into the US of exotic aquatic plant species. The Society is on record, Gorman stated, in support of the bill. Gorman called on Society members to stimulate interest in aquatic weed control by commercial applicators. Government agencies cannot treat aquatic weed problems on private property and to date, too few commercial applicators are qualified to handle the

**Robert D. Blackburn, research botanist,** Agricultural Research Service, USDA, Ft. Lauderdale, Fla., demonstrates new development in pump equipment for air boat use, during Ft. Myers annual meeting. Blackburn was elected Society president for the coming year.



specific problems. He complimented the work of researchers on present aquatic problems within the scope of current financing, but called for more research on control programs by university staffs, in Florida and throughout the Southeastern US area. At the annual Society banquet, Gorman was presented a plaque for his service to the organization.

Also receiving an award was William E. Wunderlich, chief of the US Army Corps of Engineers

aquatic growth control section at New Orleans, La. He received a lifetime membership to coincide with his retirement. On the formal program, Wunderlich discussed mechanical harvesters which have been used for a number of years to clear hyacinths from navigable channels. These harvesters, he said, are limited to waters deep enough to float them. Chemicals, he said, have ruled out all but about 3% of such work in his area. Attempts

*(Continued on page 38)*

**Charlie P. Johnson, left,** president of the Johnson Spray Company which bears his name, and Paul R. Cohee, technical sales representative of Hercules, Inc. Cohee was elected secretary-treasurer of the group for the new year.

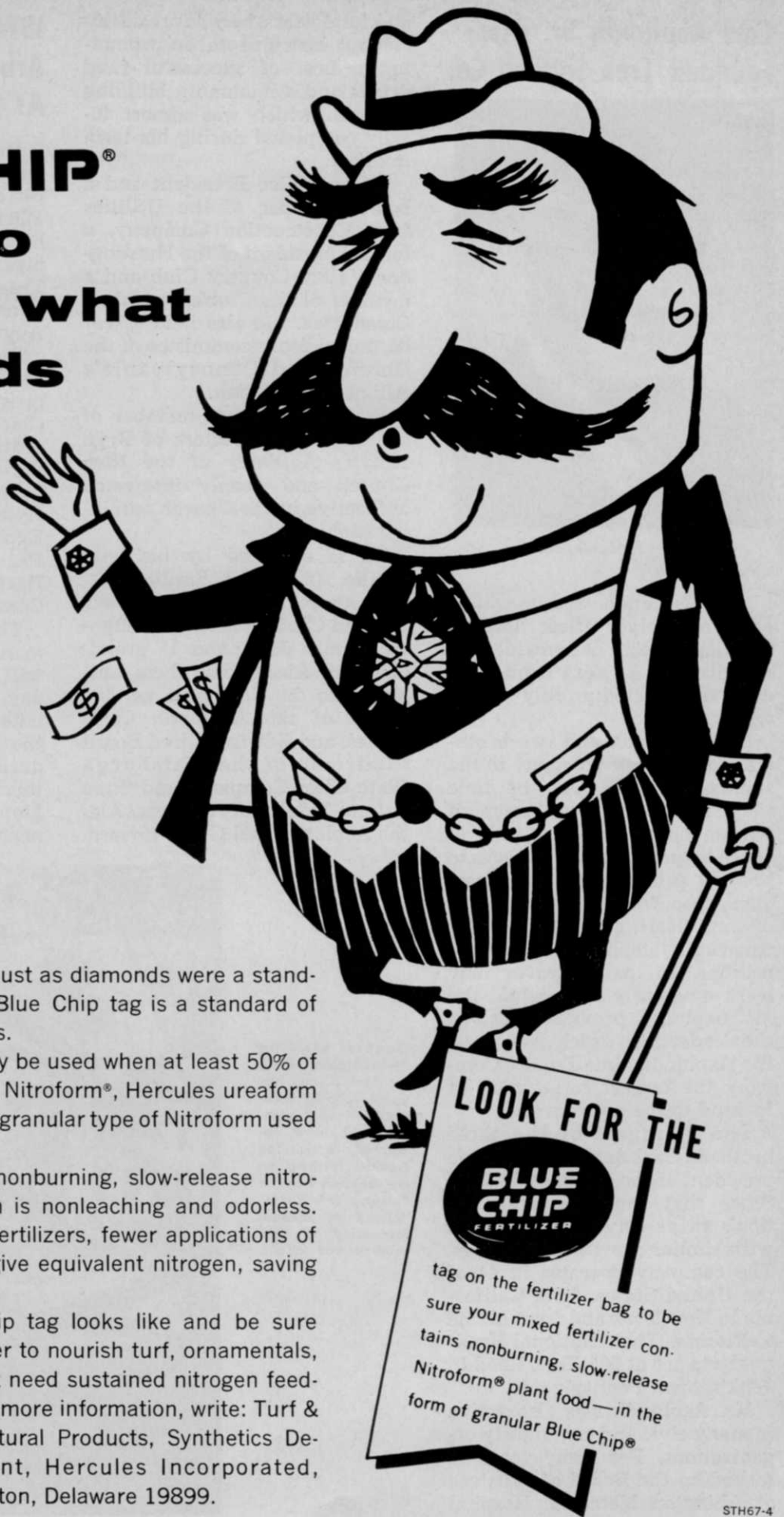


**Andy L. Price, aquatic biologist** of Pennsalt Chemicals Corp., Orlando, Fla., center, examines spray gun with group during field demonstration. Price discussed commercial aquatic weed control in southeastern U.S. on Society formal program.





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## Carl Asplundh Sr. Dies; Founded Tree Service Co.



Carl Asplundh, Sr.

Carl Asplundh, Sr., president, chief executive officer and co-founder of the nationwide Asplundh Tree Expert Company died unexpectedly July 2. He was 63.

Mr. Asplundh and two brothers created their company in the summer of 1928. At the time they had only two crews of workmen, two trucks and an office helper. Their intent was to provide professional line clearance, tree trimming and right-of-way clearing, exclusively for America's telephone and electric utilities. In that endeavor they were eminently successful, and Mr. Asplundh provided much of the leadership which has made the Asplundh Tree Expert Company the largest corporation of its kind in the entire world.

The youngest of the three brothers, Carl Asplundh, became president of the company in 1952. Since that time the organization's sales have quadrupled with similar growth in earnings. The company operates in 44 of the United States, from California to New York and from Maine to Florida. Their National Headquarters are at 505 York Road in Jenkintown, Pennsylvania.

Mr. Asplundh was also active in many civic and community organizations. For many years he served on the Board of Trustees at Abington Memorial Hospital

and for 4 years, he was president. He was instrumental in promoting a host of successful fund drives and a mammoth building program which was almost totally completed during his term in office.

He was Vice President and a board member of the Utilities Line Construction Company, a former president of the Huntingdon Valley Country Club and a member of the Club's Executive Committee. He also held a seat on the advisory committee of the University of Pennsylvania's Alumni Association.

He was a current member of the Board of Directors of Bryn Athyn's Academy of the New Church and deeply interested and active in the Church administration.

He is survived by his wife Emilie (formerly Emilie Kessel); three sons, Edward, Carl, Jr., and Christopher; one daughter, Emily Jane, and 11 grandchildren. Also two brothers, Lester, who is Chairman of the Board of the Asplundh Companies, and Edwin, retired Board Chairman of the Pittsburgh Plate Glass Company; and three sisters, Fidelia de Charms, Alethe Asplundh and Guida Bovard.

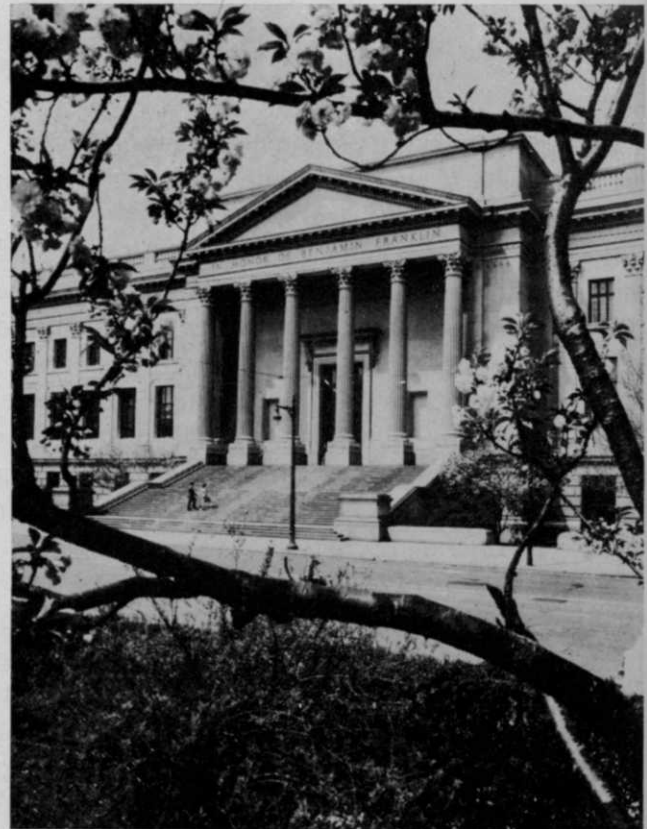
## ISTC and National Arborists To Meet At Philadelphia

Members of the shade tree industry will gather at Philadelphia late this month. The Marriott Motor Hotel will be headquarters for annual meetings of the International Shade Tree Conference and the National Arborist Association, both August 27-31.

Registration begins at 9:00 a.m. Sunday, Aug. 27. Arranging the program for the arborists is Clarke W. Davis, association executive secretary. For the ISTC, the program has been put together by General Chairman Hyland R. Johns, Asplundh Tree Expert Company, Jenkintown, Pa., and Co-chairman Ronald L. Harper of Philadelphia Electric Company.

The Honorable Orville Freeman, Secretary of Agriculture, will be in Philadelphia on Tuesday, August 29, to give the Keynote Address to the members of the ISTC. Freeman will speak during the convention's Keynote luncheon at noon at the Marriott Motor Hotel on City Avenue, near the Schuylkill Expressway,

Guests visiting Philadelphia, Pa., for the ISTC and National Arborist Association annual meetings will have opportunity to visit The Franklin Institute on the Benjamin Franklin Parkway. It is a wonderland of science, fascinating to both children and adults.





ten minutes from downtown Philadelphia.

Approximately 1000 tree men, many with their families, will be coming to Philadelphia for the convention.

Another convention highlight will be the commercial equipment demonstrations to be held all day Wednesday, Aug. 30, very near Marriott Motel, in a section of Philadelphia's famous and beautiful Fairmount Park, one of Philadelphia's most valuable assets; the largest Municipal Park in the world, which is celebrating its 100th Anniversary this year.

#### Manufacturers To Be Well Represented

Virtually every major manufacturer of equipment used in any phase of tree work will be there to demonstrate the very newest tools of the tree industry, from lightweight chain saws, to wood chippers, to giant aerial lift platforms, and tree movers.

The first time the 43-year-old convention was in Philadelphia was 1926, and the last time was 1957. Since 1957, however, there

have been basic changes in the tree care industry, and manpower shortages have resulted in more sophisticated power equipment.

Experts from all parts of the world are scheduled to speak to the gathering of tree men, while an extensive tourist program has been set up for the other members of the family. The ladies program includes a walking tour of the Independence Hall area, a guided tour of the Philadelphia Art Museum, and lunch at the top of the Barclay Hotel.

The youth program includes a trip to the Philadelphia Zoo, the Franklin Institute, and the Museum of Natural History.

"Municipal Arboriculture" will demand a special session for interested people. Among the several topics in this special session will be the use of plant containers in downtown areas by Dr. Yves Desmarais, deputy director of the Montreal, Canada, Botanic Garden.

There also will be a discussion session about the best trees for downtown planting. The moder-

ator for this discussion will be Brian Fewer, supervisor of street tree planting, Department of Public Works, San Francisco, Calif.

Utility arboriculture is a field that is steadily growing in public interest, and because of this increased interest and concern, is getting more and more attention from all utility companies. Mr. R. L. Harper, the arborist for Philadelphia Electric Company and co-chairman of this year's convention, will talk about this public concern and how the Philadelphia Electric Company stays ahead of the problem in his presentation, "Kilowatts and Beautification."

Also, in the same vein, there will be several experts to talk about the rapidly growing field of Chemical Vegetation Growth Control. J. H. Kirch, marketing manager for Amchem Products, Inc., one of the major suppliers of chemicals for growth control, will discuss "Prescription Vegetation Control-Realistic and Necessary."

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patibility" will be discussed by R. B. Beck, general superintendent, Southern California Edison Company, Los Angeles, Calif.

The executive director of the ISTC, Dr. L. C. Chadwick, will moderate a discussion on "Shade Tree Supplies—Quantities Available In The Years Ahead." An innovation at this year's convention is called "Slide Parade—Gripes and Brags." Any member may show up to six slides on any subject.

### Dr. L. C. Chadwick Retires From University Post In '67

Dr. L. C. Chadwick, head of the Division of Floriculture and Ornamental Horticulture at The Ohio State University, Columbus, O., retires beginning next month. WTT is happy to honor him with his appearance on the special ISTC issue cover. He serves as executive director of the ISTC.

Dr. Chadwick, or "Chad" as he is known, is a native of Vermont with a B.S. from the University of Vermont. He served as an instructor at Cornell until 1929 when he became a staff member at The Ohio State University. His doctorate was granted by Cornell in 1931.

During his tenure at The Ohio State University, he served in a dual capacity with O.S.U. and with the Ohio Agricultural Research and Development Center at Wooster, O. The Center, formerly the Ohio Agricultural Experiment Station, operates as the research arm in agriculture for Ohio, and is an independent entity.

Through the years Dr. Chadwick has become well known for his ornamental tree and other research including selection and use of wood plant materials, arboriculture, plant propagation and nursery management. He is a member of numerous societies in his field and is active in civic groups as well. He has co-authored two books with Professor Alex Laurie, also of O.S.U., and has published numerous bulletins and papers in his field. Among his many honors is the

ISTC award of merit, given in 1963. This award was based on his service and leadership in the organization and his interest in the field. The same year, the American Horticultural Society presented him its citation award for more than 30 years' service as teacher and researcher in ornamental horticulture, and for service to arborists of the nation and assistance in the affairs of their organizations. In his adopted home state, the Ohio Nurserymen's Association early this year established the L. C. Chadwick Memorial Research Fund at O.S.U. in his honor.

### Thrips Foiled By New Chemicals

Thrip damage which has attacked the popular Cuban laurel, or laurel fig, ornamental tree for the past 7 years can now be alleviated.

Cygon, federally approved as a drench on ornamental trees, has proved almost 100% effective in killing the insects. A solution is applied by drenching soil around the base of the tree trunk. Chemical soaks into the ground and is taken up by roots to become a part of the sap system of the tree. Thrips feeding on leaves are killed. Treatment, according to University of California researchers at Riverside, Calif., will last 160 days. Children and pets must be protected from treated areas until the surface is dry.

Equally effective chemicals are Meta-Systox-R and Ambush; however, these have not as yet received federal approval.

Cuban laurel is a southland ornamental which resists smog and dust and which has been very popular in California. Prior to 1959, it suffered little or no damage from pests. Then thrips began attacking the trees as far north as San Mateo County in California.

A research team of Andrew S. Deal, extension entomologist, and William R. Bowen, research technician, aided by Wesley A. Humphrey, Orange County, and Jack L. Bivins, Santa Barbara County, tested the new systemic compounds throughout the area.





## SOD INDUSTRY SECTION



# Mechanical Wheel-Move Irrigation System Saves Field Time For McGovern Sod Farms

As any sod grower knows, "You are out of business if you don't irrigate." And on the larger sod operations, getting an adequate amount of water applied during the time grass needs it most may be a frustrating task. This is especially true during the dry months of summer, when sprinklers must be kept in constant operation to fulfill the demands of rapidly developing root systems.

The reason for such frustration lies primarily with the time lost in moving standard irrigation piping. Naturally, pipe cannot be moved while the sprinklers are in operation. The system must be shut down and restarted after the pipe-moving operation has been completed. Such time lost generally requires 20% of the total time allowed for sprinkling. For example: A given field may be irrigated for 2 hours before movement is necessary, and such movement may take three men ½ hour. This large amount of time lost has prompted many growers to invest in mechanical wheel-move irrigation systems.

McGovern Sod Farms of Melville, N.Y., is one of these innovation-minded growers. To date, McGovern has invested in two of these systems, each able to keep a ¼-mile length of 4"-diameter pipe in constant sprinkling operation. McGovern's new

mechanical irrigation systems have the aluminum pipe sitting on an "A" frame, mounted on a set of steel wheels, neither pipe nor sprinklers ever turning. This new system features an exclusive hydraulic drive with a self-starter and utilizes forward, neutral, and reverse by means of an easily controlled hand valve.

Moving at the rate of 15 feet per minute, all wheels drive at the same time from the center source of power, a gasoline engine. In the event one wheel bogs down or meets some obstruction, a safety design feature shuts off the power to prevent twisting the line. As the power goes off, the wheels are auto-

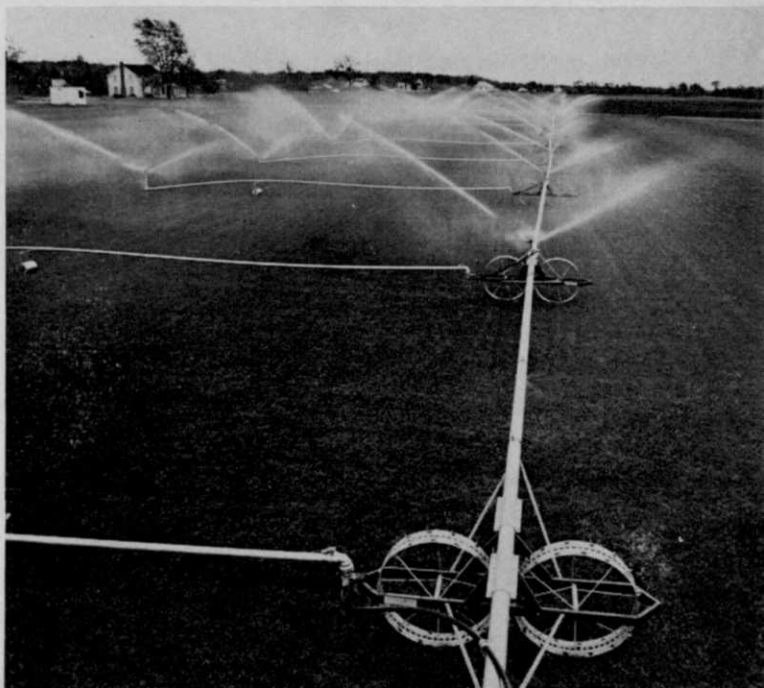
matically locked so that the movement due to wind, incline, etc., is precluded. Another noteworthy feature is the fact that the self-draining sprinklers stay upright at all times.

### First East Coast System With Drag Line On Wheels

The East Coast distributor of these systems, National Irrigation, Inc., of Roosevelt, New Jersey, informs McGovern that, "This is the first mechanical irrigation system in the east that has a drag line following the wheels with a sprinkler at the end of each pipe."

Both Dick and Ed McGovern,

**McGovern's wheel-move irrigation system** travels at the rate of 15 feet per minute, all wheels being driven by a gasoline engine. Should one wheel lag, power is shut off automatically. Wheels lock in place when power is shut off. Big advantage of system, according to owners, is labor and time saved.



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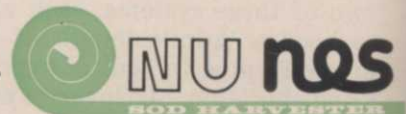
With a NU nes Sod Harvester and three men, you can lift, roll, and palletize up to 1,200 square yards of sod per hour. NU nes, developed at Cal-Turf Farms, is designed to handle any length of rolled or slabbed sod. Field grading of sod is done by the tractor operator, who has clear visibility at all times. Hydraulic controls permit quick and easy adjustment for

all conditions. The Sod Harvester travels alongside, never on the turf, during harvesting, and can pick up and roll sod under any moisture condition. Loaded pallets can be spotted for later field removal and be clear of the next harvesting run. If direct truck loading is desired, a conveyor extension is available. The basic power train is a Ford LCG-2110 wheel

tractor. The sod harvester can travel at speeds up to 17 MPH for quick transportation between plots. The efficiency of this all-mechanical operation has been proven on the Cal-Turf Farms, and can solve the problem of harvesting sod quickly and economically for all turf farmers. No more waiting for weather or labor.

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the owner-operators of McGovern Sod Farms, Inc., were impressed with the laborsaving benefits of these irrigation systems. Not only can more water be applied in a given period of time, but also less manpower is needed to operate the systems during this same time period. With a standard system, crews of three men each are needed to work at pipe moving, tending generally two or three sod fields per crew. Under the new mechanical wheel-move system, any worker can move a sprinkler line (up to 1/4 mile wide) in five minutes.

It is estimated that cost of the basic wheel-move components; i.e., power unit and wheel units, is approximately four times the cost of standard system components, i.e., pipe and sprinklers. However, it is felt that the advantages in laborsaving and timesaving will more than justify this extra cost. Furthermore, says Ed McGovern, "This system will enable us to continue growing top-quality turf in greater quantity."

## Sod Producers Form National Group

Sod growers formally organized into a national group on July 11 at East Lansing, Mich. Considered a key move for the nation's growers, the formal action followed naming of a committee for the purpose earlier this year at the International Turfgrass Conference.

The new group organized as the American Sod Producers Association with a charter membership of 40 growers. Membership fees for the new organization will be \$50.


Elected president of the group was Ben O. Warren, Warren's Turf Nursery, Palos Park, Ill. Vice-president is Robert Daymon, president of Emerald Valley Turf Nurseries, Howell, Mich. Elected treasurer was Louis DeLea, Louis DeLea & Sons, East Northport, Long Island, N.Y.; and secretary, Richard Horner, Horner Sod Farms, Wind Lake, Wis. Other members elected to the 7-man board besides the officers were: To-

bias Grether, Cal-Turf, Inc., Camarillo, Calif.; J. E. Ousley, Sr., Ousley Sod Company, Pompano Beach, Fla.; and Wiley Miner, Princeton Turf Farms, Inc., Cranbury, N. J. Acting for the secretary and treasurer is George B. Hammond, Paint Valley Bluegrass Farm, 71 E. State St., Columbus, O. Hammond is coordinating requests for membership in the new organization and is answering queries directed to the group.

## Final Applications For M.S.U. Turf Training


Michigan's 18-month-long technical training program in turfgrass management will begin next month. The program which starts September 21 includes 1 year of campus study and 6 months of industry employment.

Dr. James Beard, of the department of Crop Science, reports that 28 of a full complement of 35 students are now enrolled. Final registration date is September 18.

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Ryan Equipment Company's new tractor-mounted sod roller is demonstrated by Jerry Ogren, of the company's St. Paul, Minn., office, to American Sod Association Field Day crowd.

# American Sod Association Stages First Field Day

demonstration tour held  
in conjunction with  
Michigan State University  
Turfgrass Field Day

A NEW national group, the American Sod Producers Association, staged their first major event July 12 with a demonstration tour of sod production and equipment. The new group, officially organized the night of July 11, received a big assist from the staff of Michigan State University. Wayne County Agent Donald D. Juchartz with

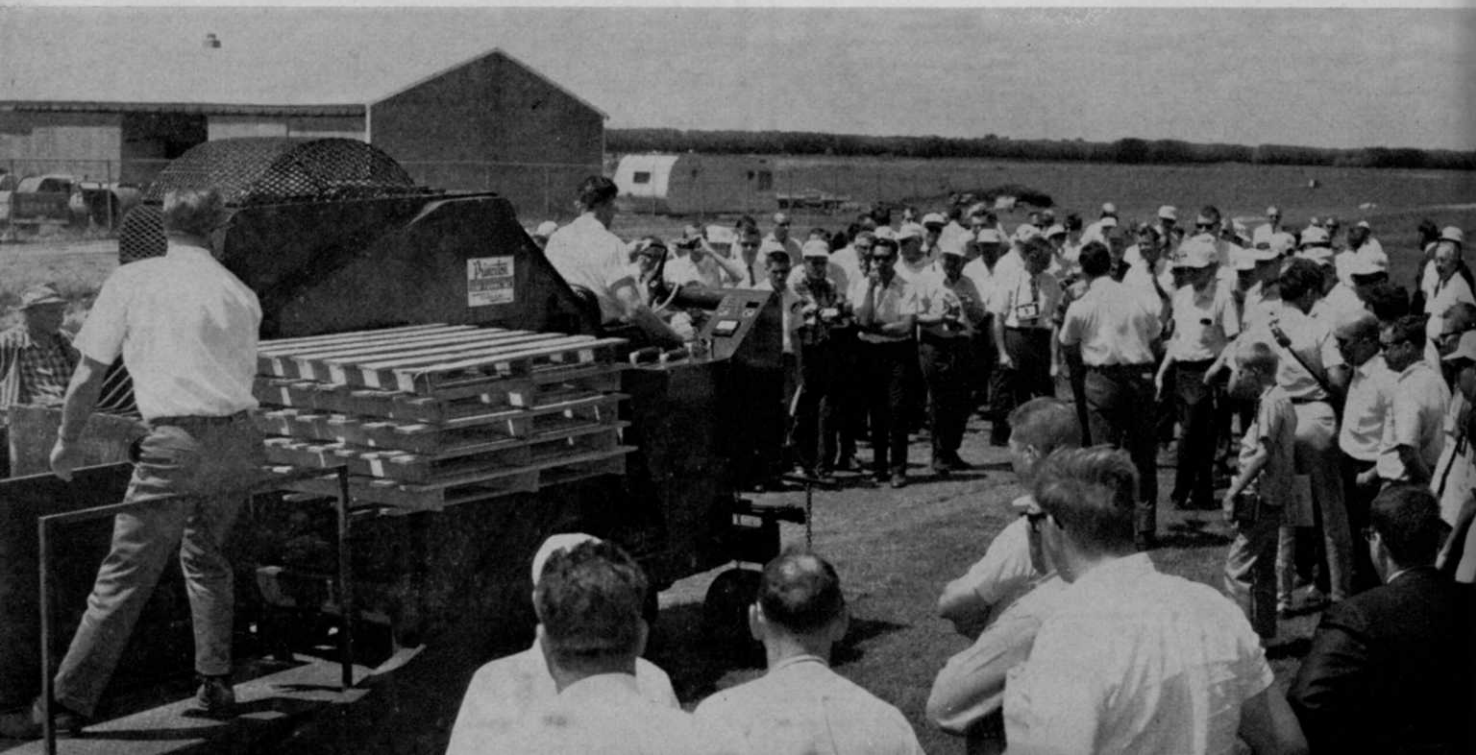
less than one month's notice contacted equipment manufacturers and sod producers, at the same time working closely with Dr. James B. Beard and Dr. Paul Rieke, staff members at M.S.U.

Drs. Beard and Rieke staged their annual Turfgrass Field Day at M.S.U. June 11. Despite rain in the surrounding area, their expected crowd of 500 to

visit turf research amounted to 350. And some 200 stayed over or returned for the Sod Field Day.

Sod Field Day activities started with a morning session at Emerald Valley Turf Nurseries, Inc., which is located just off Interstate 96 in southwestern Livingston County, Mich. Bob Daymon, president of Emerald

Field Day crowd, numbering about 200, closes in on equipment for start of equipment demonstration which featured the Princeton sod harvester.





Valley, served as host to sod producers and equipment makers from throughout the country.

Daymon demonstrated equipment developed and built at the farm and toured the group over the 700-acre Merion bluegrass sod producing area. Visitors were shown the solid set irrigation system, aerial application, sod production and the office and shop at the farm. Following a lunch period, chartered busses were used by the group to move to the Halmick Sod Nursery on the outskirts of East Lansing, Mich. Here again, sod harvesting was featured. After touring the Halmick harvesting, equipment manufacturers who had their equipment on display at this location started the field demonstration.

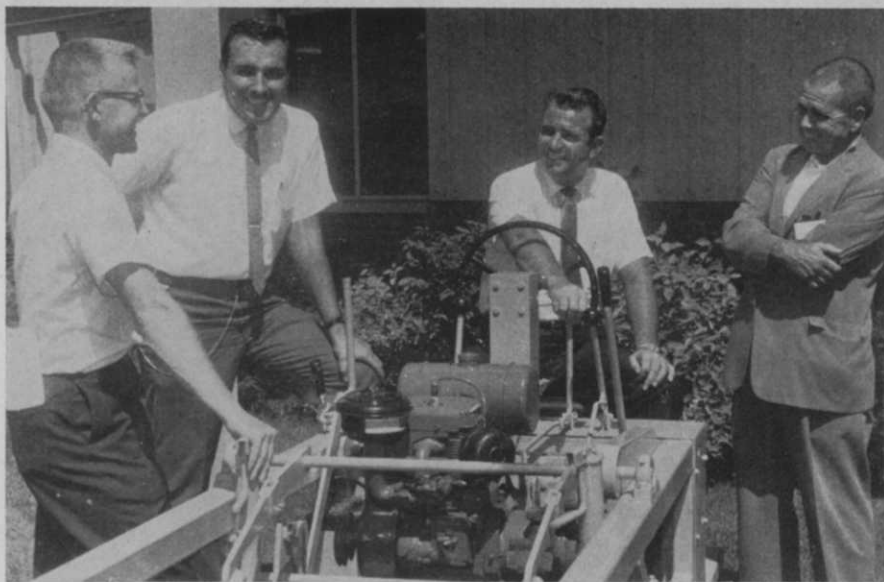
This field demonstration likely featured the greatest array of sod harvesting and handling equipment anywhere to date. Veterans in the industry could recall no prior event where as many different type units for cutting and rolling sod had been assembled for exhibit.

Prior to the American Sod Producers Field Day, Michigan State University on the previous day had sponsored a tour and field day of continuing research which is dedicated to helping the industry develop.

Dr. Beard, in reviewing Michigan's turf year, commented on extensive damage from *Helminthosporium leafspot* which was a month or more early in 1967. He said that reports of *Fusarium blight* activity are also increasing. The disease was first observed in Michigan last year. Concern is great because no effective fungicide is yet available.

Bentgrass plots showed that Cohansey and Toronto creeping bentgrasses continue to rank high in overall turf quality. Penncross seems to be the top seeded bentgrass in the Michigan trials.

In a study of growth reduction caused by hot weather, Harlan Stoin, of the M.S.U. research staff, related that tests show an overall increase in the soluble nitrogen content of grasses grown under high temperatures. There is a possibility, he re-



**Daymon Sod Roller** operation is explained by Bob Daymon, on driver's seat, during tour of Daymon's Emerald Valley sod farm, to Duane Girbach, Livingston County, Mich., county agent, left, and Donald Juchartz, Wayne County, Mich., county agent. To right is Ben O. Warren, Warren's Turf Nursery, Palos Park, Ill.



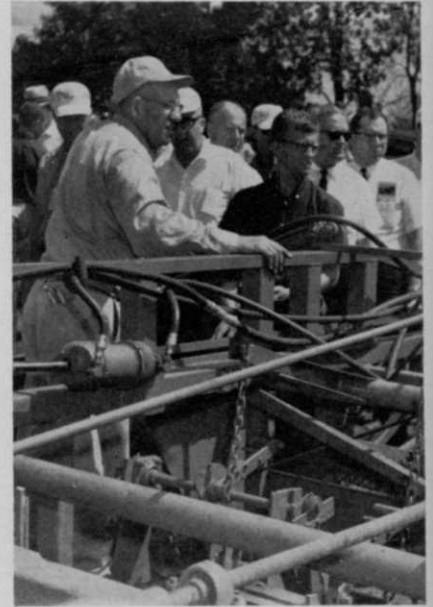
**Nunes Sod Harvester** is demonstrated by John Nunes of Cal-Turf Farms. Nunes reported unit will lift, roll, and palletize up to 1200 square yards per hour.

**Hadfield Sod Roller**, designed to fit on Ryan sod cutter, was among new equipment demonstrated. Hadfield reports unit operates strictly as 1-man operation and is particularly well adapted to smaller sod farm. Roller is manufactured by Hadfield at Oxford, Mich.

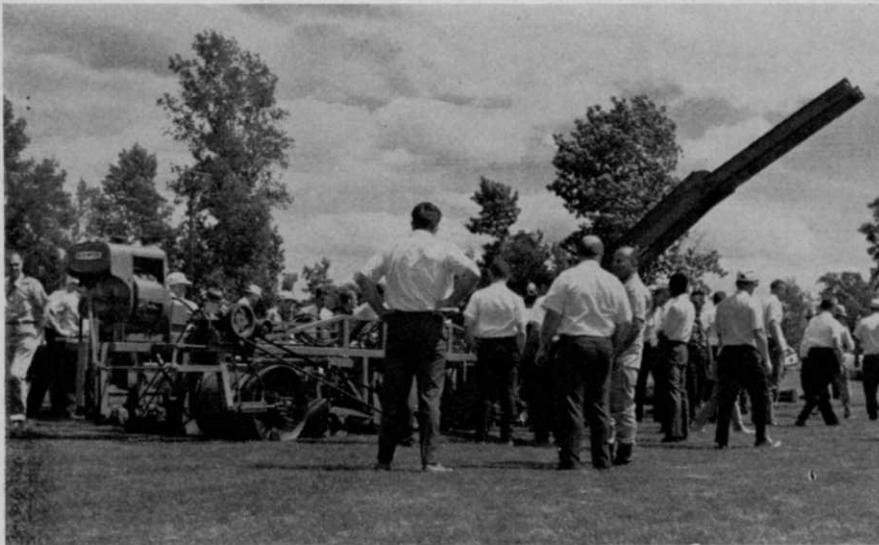




**Halmick Sod Nursery** sod being loaded on Halmick truck during demonstration. Brand name is that promoted for Merion bluegrass which is sold in Cleveland, O., area. Loader was built on Halmick farm.



**Cliff Wetzel, sod producer** at Ithaca, Mich., above, explains new sod harvester which he demonstrated for first time at sod association's field day. Harvester, left, is designed to handle three roll widths of sod at one time.



ported, of turfgrasses being affected by ammonium toxicity during hot weather.

Dr. Paul Rieke reported that a nitrogen and potassium balance increases winter hardiness of common Kentucky bluegrass. Maximum survival occurred when the ratio was 2 or 3 parts of nitrogen to 1 of potassium, even under high nitrogen levels.

Twenty-four varieties of red fescue are being evaluated according to a report by Extension Specialist Stuart Hildebrand. Pennlawn and Rainier, he said, are the top ranking commercially available creeping red fescues. Pennlawn is preferred because of its drought and cold weather tolerances.

**Rogers Turf Sweeper** was demonstrated by Clarke H. Staples, right. Unit has 5-foot sweeping width with 5-cubic yard hopper, also is equipped with thatcher-thinner attachment.

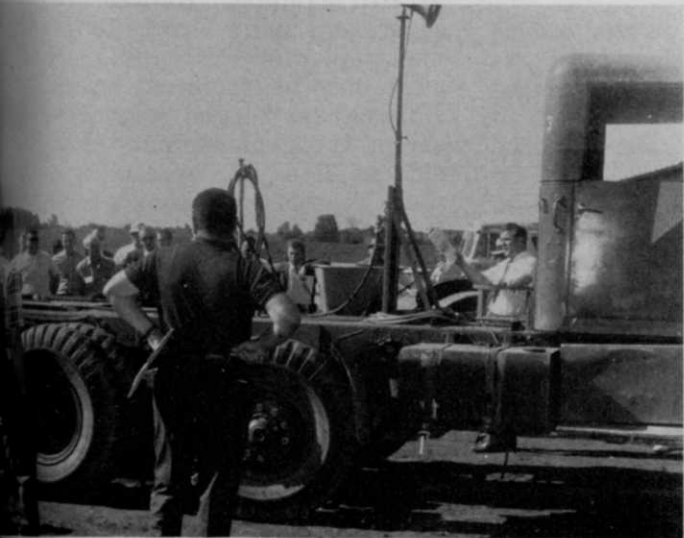




**Giant-Trail Vac thatcher and pickup unit** at right was field demonstrated. Unit here featured all-steel trailer 5' x 3½' x 4'. Wide 16-inch flotation wheels are used on rear with 10-inch pneumatic swivel casters in front. Hitches on all Giant Vac equipment vary and must be ordered for specific tractor unit. Besides customized Giant-Vac units below, company displayed blower and self-propelled equipment.



**Developed at Emerald Valley Turf Nurseries**, this 18-wheel truck-tractor pulls load of up to 1700 square yards of sod at a time, to and from fields. Speaker is for furnishing music to crew, preferably "fast" music, according to Bob Daymon, right.



**Princeton Turf Farms' Sod Harvester** is capable of handling up to 10,000 square feet of cut and palletized sod per hour, based on report during field day demonstration. Wiley Miner, president of Princeton Turf Farms, on hand for the field day, was instrumental in development of the machine which operates with 3 men and produces uniform pads of folded sod, stacked on pallets.

**Prominent at Field Day and Michigan Turfgrass session** at Michigan State University were: left to right, Donald Juchartz, Wayne County agent, Mich.; Dick Gorrell, Emerald Valley farm manager; Bob Daymon, Emerald Valley president; Dr. James B. Beard, Michigan State University; Duane Girbach, Livingston County agent, Mich.; K. T. Payne, M.S.U.; Dr. Bob Lucas, M.S.U. Extension specialist; and Dr. Paul Rieke, M.S.U.



## Evergreen Diseases

(from page 14)

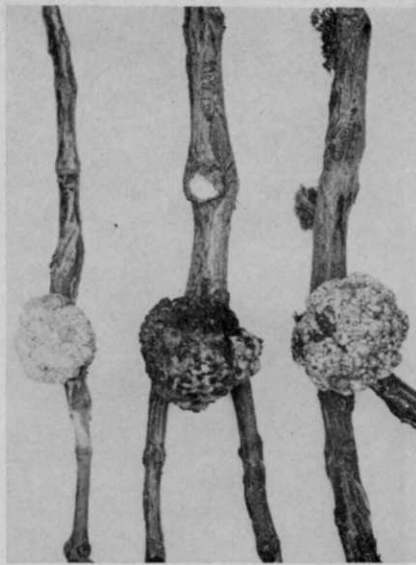
ing. Wounds should be treated with a good wound dressing. Pruning tools should be sterilized between cuts with alcohol, Chlorox, or formaldehyde, and pruning should be done only in dry weather, since spores of the fungus are readily transferred to healthy tissues under moist conditions.

Other canker diseases, such as *Pseudonecrotia* canker of boxwood and *Nectria* canker of Euonymus and other plants, occasionally occur, usually on weakened plants. Control measures for these and other canker diseases of evergreens are the same as for *Cytospora* canker. Applying organic mercury sprays in the spring to susceptible plants may provide some degree of protection against cankers.

### White Pine Blister Rust Is Very Destructive

For many years the most destructive disease of white pine forests and plantings in the United States has been blister rust caused by the fungus *Cronartium ribicola*. Losses from this disease have been so severe that federal funds are regularly appropriated for its control. Fortunately, blister rust is not known to be of consequence in ornamental plantings because of quarantine regulations against plantings of susceptible currants and gooseberries which serve as alternate hosts for the fungus. In addition, blister rust is seldom found on white pines in the southern regions of the Midwest.

Where blister rust does occur, the fungus invades and kills needles on white pines and then moves into the bark of twigs and branches; there it produces swollen cankers which may girdle the stem. Spores produced in these cankers infect the leaves of susceptible currants and gooseberries on which spores are produced that cause further infection of pines. The best control recommendation in ornamental plantings is the removal of dead and dying branches at their point of attachment and the eradication of alternate hosts in the



Bacterial crown gall on stems of *Euonymus sarcocoe*.

area. In addition, white pines should not be planted in frost pockets or low, swampy areas where conditions of high moisture occur.

A stem disease which has a wide host range and is familiar to almost everyone who works with woody ornamental plants is bacterial crown gall. The bacteria are soil-borne and enter plants through wounds. Small to large, woody galls form on roots or at the crown of infected plants. Several species of Euonymus such as *E. fortunei* and *E. japonicus* are extremely susceptible to crown gall and are seldom found without galls. Extensive gall formation can cause girdling and death of stems. Galls may become inactive after the first year or they may persist and increase in size each year until the stem is girdled and killed.

To control this disease, all infected material should be removed and burned. Pruning tools should be disinfected to prevent spread of the bacteria. Susceptible varieties should be handled with extreme care to prevent infection of healthy plants through wounds. Whenever possible, infested soil should be planted with species or varieties of ornamentals which are resistant to crown gall.

Shoot tips of pines, firs and spruces, which lack vigor or have been weakened by insects, diseases, adverse weather conditions, drought, or unfavorable

planting sites may be attacked by the tip blight fungus, *Diplodia pinea*. Typical symptoms are wilting or drooping and eventual browning and dying of affected shoot tips. Diseased shoots should be pruned off and burned, and affected plants should be kept well watered and fertilized, since vigorous plants are less susceptible to attack. Some protection of susceptible plants can be provided by three spray applications at 2-week intervals with one of the organic mercury fungicides. The first spray should be applied when new growth first appears.

Twig blight, caused by the fungus *Phomopsis juniperovora*, attacks arborvitae and many juniper varieties as well as cypress and false-cypress. The disease fungus invades and kills the bark, and in time cankers form on diseased stems. As the cankers enlarge, affected stems die and needles turn brown. Damage caused by *Phomopsis* blight varies from year to year, but when optimum weather conditions for disease development prevail, as in 1966 in Illinois, the disease may reach epidemic proportions and can result in the loss of many valuable plants.

Since fruiting bodies containing spores of the fungus form on cankers during wet weather and provide a source of inoculum for further spread, all diseased twigs and branches should be removed and burned during dry periods. Pruning or shearing equipment should be disinfected periodically to prevent spread of the fungus to healthy tissues. When available, resistant varieties such as Hill's juniper, Keteleer red cedar, and spiny Greek juniper may be planted. Susceptible varieties may be protected against *Phomopsis* blight with five sprays of organic mercury fungicide at 10-day intervals beginning as soon as shoot growth starts in the spring.

Most stem diseases can be prevented or reduced by keeping plants healthy and vigorous. Sterilizing wounds and pruning tools and careful handling of plants to avoid wounding will help prevent the spread of the disease organisms to healthy tissues.

Diseases affecting the roots of



evergreens fortunately do not appear frequently, for once a root disease becomes established, it is usually impossible to save or cure the infected plant. Control measures must be designed to prevent initial infection. Plants subject to root diseases should be handled with care to prevent root wounding. Only resistant species or varieties should be placed in a site which has a history of root infection, since root disease fungi are usually soil-borne and difficult, if not impossible, to eradicate. Under certain conditions soil fungicides can be of value in controlling root diseases.

#### **Root Rot Of Pine Usually Only In Forests**

Although considered a disease which is usually confined to forest plantings, root rot of pine caused by the fungus *Fomes annosus* has been found on a wide range of hosts and may eventually appear in ornamental plantings. The disease causes extensive damage in thinned pine plantations, but is rarely a problem in the Midwest on unthinned plantings. The disease fungus enters the host through wounds or cut stumps and spreads readily to adjacent healthy plants through root contacts or grafts. Trees affected by this disease appear suddenly to turn brown and die, although the fungus may have been present in the trees for one or more years before symptoms showed up. In late fall, fruiting bodies or conks of *F. annosus* may appear around the base of diseased trees beneath the duff or leaf litter.

Some control has been achieved in affected pine plantings by treating cut stumps with urea at the time of thinning. This practice promotes the growth of other fungi which colonize cut stumps and are antagonistic to *F. annosus*. If root rot appears in an ornamental planting, it is advisable to treat all wounds on susceptible evergreens with a good wound dressing and to remove all diseased plants and all slash and dead wood from the area.

In recent years the fungus *Phytophthora cinnamomi* has been identified as the cause of wilting and death of several

ornamental species, particularly yews and azaleas. In Indiana, where considerable loss of yews in nursery fields has been observed, diseased plants became light green at first, and then dried out and died. In most cases brown streaking was found in the sapwood of the crown and larger roots.

In southern areas of the Midwest where azaleas are grown in the field and in greenhouses where potted azaleas are grown, *Phytophthora* root rot can become a serious problem. The foliage of affected plants becomes sparse and thin and tends to wilt with increasing frequency until permanent wilting and death occur. The wood of diseased plants usually show brown discoloration.

Potted plants may be kept free of *P. cinnamomi* with sterilized soil and disease-free planting stock. In addition, all benches and implements should be kept clean, and tools should be sterilized frequently wherever possible. If *P. cinnamomi* is found, all diseased plants should be destroyed, and all benches and the soil of apparently healthy plants should be drenched immediately at the rate of 2 pounds in 100 gallons of water with a Dexon-Terraclor fungicide mixture. Some control of root rot in the field with Dexon or Dexon-Terraclor has been reported. All diseased plants in the field should be destroyed, root wounding should be kept to a minimum, and only resistant species or varieties of ornamentals should be planted in fields where *P. cinnamomi* is present. Diseased plants cannot be cured by any method now known.

#### **Fungi Cause Damping-Off**

Several fungi cause damping-off or seedling blights. The most common ones are species of *Fusarium*, *Pythium*, *Phytophthora*, *Rhizoctonia*, and *Botrytis*. These organisms most frequently attack seedlings or cuttings, killing the tissue of roots and stems near the ground line and often causing affected plants to fall over. The standard control procedure for these diseases is soil sterilization, either by steam or fungicidal chemicals. Damping-off

and seedling blights are common in seedling and cutting beds but occur only rarely under field conditions.

A fungus which can cause not only seedling blight but also death of young conifers in the field is *Cylindrocladium scoparium*. Spruce and red pine are most commonly affected. Symptoms appear as root rot, discoloration of crown and root tissues, and crown cankers resembling those of heat injury. Since the fungus is soil-borne, sterilization of seedling beds is recommended. Control in the field is more difficult, and resistant species or varieties of conifers should be used where this fungus is present.

#### **Many Types Of Trees Hurt**

The fungus *Armillaria mellea* attacks a wide range of plants including many deciduous species and a few evergreens such as Douglas fir, pine, rhododendron, and yew. Affected trees are usually stag-headed and are easily blown over or uprooted by high winds because of their rotted roots. Black fungus strands called shoestrings may be found in the duff or soil around diseased trees, and white fungus fans or dark red, rootlike strands are present beneath the bark. Since weakened and injured plants are most susceptible to this disease, such plants should be fertilized and watered to protect them from *Armillaria* infection. No control is known to be effective once infection has taken place.

Wilting, dieback, and decline of a large number of plant species and varieties is caused by the fungus *Verticillium albo-atrum*. Although most of the hosts are deciduous, occasionally an evergreen such as *Viburnum lentago* may be seriously damaged. The most obvious symptoms of *Verticillium* wilt are wilting and dieback, usually occurring over a period of several years. Most plant species infected with this fungus show discoloration in the sapwood. Since the fungus is soil-borne, control measures in the field are difficult. Root wounding should be kept to a minimum to prevent infection, and resistant species should be

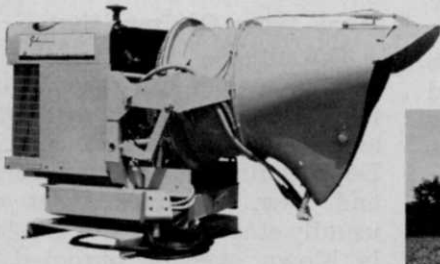


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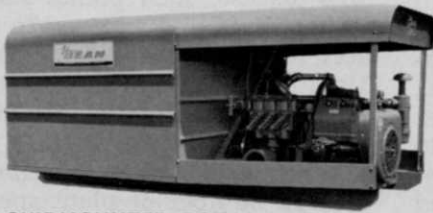
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planted where Verticillium wilt has become a problem. In some cases diseased plants may recover following fertilization.

Practically all plants, including evergreens, may be damaged by a group of microscopic roundworms known as nematodes. In the past if a plant did not show symptoms of the nematode disease known as root knot, it was thought to be nematode-free. Recent investigations have shown, however, that many species of nematodes other than those causing root knot feed on the roots of ornamental plants and can cause damage. Symptoms of nematode attack may range from almost undetectable stunting to chlorosis; slow decline; increased susceptibility to diseases, insects, and winter injury; and death of affected plants.

The importance of nematodes is increased by the fact that injury or wounds caused by their attack may provide points of entrance for soil-borne disease organisms. In addition, some nematode species have been shown to transmit virus diseases. The true significance of nematodes in the culture of evergreens and other ornamental plants awaits further investigation, but all the facts point to nematodes as a cause of considerable concern to the entire ornamental plant industry. Increasing research in this field is already under way.

In addition to losses caused by disease organisms, many evergreen troubles are caused by adverse weather, nutrient deficiency, mechanical damage, and chemical injury. No standard set of procedures can prevent or control such a variety of troubles; consequently each has its own control recommendations.

Yellowing or chlorosis of evergreens may result from many different causes. Any disease, insect, or mechanical injury may bring about yellowing of foliage, but in most cases other symptoms are also present.

#### **Chlorosis Remedied By N**

Chlorosis most frequently results from the lack of an adequate amount of some nutrient, such as nitrogen or iron, in the soil. Nitrogen deficiency usually

appears as a general yellowing and stunting of the plant and is easily remedied by the application of a standard high-nitrogen fertilizer.

Iron deficiency, on the other hand, appears as chlorosis or yellowing of interveinal tissues, while veins remain green. Iron deficiency chlorosis is most pronounced on the youngest growth and increases in severity with each new flush of growth. Although iron may be present in a

soil, it becomes chemically bound under alkaline conditions, and some species of plants are not able to obtain it from the soil. For example, yews may be dark green and healthy in a soil with a pH rating of 7 or higher, whereas adjacent azaleas in the same soil are highly chlorotic. The ability to obtain iron is genetically controlled and the process is not well understood.

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pounds may be applied either to the soil or directly to the chlorotic foliage. Foliage treatment may be adequate if the plant is to be transplanted within a year, but this treatment is not long lasting and would have to be repeated, since iron is not translocated from leaves to other parts of the plant or to new growth. In the case of a home or industrial landscape planting of the permanent type, applying iron-containing compounds to the soil will give more lasting results. Iron sulfate may be applied to the soil alone or in combination with sulfur to acidify the soil. In highly alkaline soils, compounds known as chelated iron are usually more effective than other materials. A good way to avoid iron deficiency chlorosis is to check the acidity of the soil and not to plant in alkaline soil varieties known to become chlorotic easily.

With the increasing use of weed killers and pesticides, the improper application of these materials has also increased. Too many people feel that if one pound will do the job, two pounds will do it twice as well; consequently chemical injury occurs frequently. Damage due to excessive or improper use of weed killers, such as 2,4-D; 2,4,5-T; or amino triazol, usually appears as curling and distortion of foliage and succulent shoots, sometimes accompanied by chlorosis, and browning and death of tissues in severe cases. Little can be done to correct the damage on injured plants except to prune out dead material and to keep the plants well watered. Fertilizer applications to injured plants may increase the amount of damage. The best way to avoid injury by weed killers is to use them with caution, try to keep them away from ornamental plants, and above all, follow the manufacturer's recommendations.

Excessive application of fungicides, insecticides, or fertilizers can result in damage to evergreens as well as deciduous species. Foliage burn, dieback, and occasionally death of the plant are typical symptoms. Plants injured by these materials should be pruned and watered. Again

the best control is to use any agricultural chemical as recommended by the manufacturer at the rate specified on the package.

Although many people find it hard to believe that mature trees, shrubs, and evergreens are subject to injury during dry periods, such is not the case. The small feeder roots of most plants are succulent and tender and may be injured or killed when soil moisture becomes depleted. Soils differ in their moisture-holding capacity, and root damage may occur more rapidly in sandy soils than in clay or loam soils. Most ornamental plants will be more vigorous and less susceptible to insects, diseases, and winter injury if they are watered periodically during dry periods. The volume of water applied and the frequency of watering should depend on the species and size of the plant, the soil type, and the quality of drainage at the planting site.

### Symptoms Are Similar

Oddly enough, the symptoms of drought can result from an excess of water as well as a deficiency of water. Where excess water or poor drainage is a problem, the lack of proper aeration necessary for normal functions of the root system prevents the uptake of water, causing wilting and browning of aerial parts of the plant just as lack of water does. Control in one case involves more frequent watering; and in the other, providing better drainage is the answer.

Many evergreen varieties in the Midwest are injured as a result of unfavorable climatic conditions during the winter. Two main types of injury are common: drying or desiccation of foliage and tissue-kill from a severe drop in temperature.

During the winter when water in the soil and roots of evergreens is frozen and not available to the plants, the loss of moisture from the foliage caused by drying winds frequently results in browning and drying of foliage or small twigs. Desiccation can be prevented by mulching, watering up to the time the ground freezes, and spraying very sensitive varieties with an



antidesiccant. After the injury has occurred, little can be done to correct the damage except to prune or shear all dead materials and fertilize and water to restore vigorous growth.

A more severe type of injury may occur as a result of a rapid and extensive drop in temperature, either in late fall following a period of warm weather and before tissues have matured and hardened, or in early spring following a warm period which has caused tissues to break dormancy or at least to resume metabolic activity. The symptoms of low-temperature injury may be similar to desiccation or they may appear as twig or branch dieback or splitting of bark near the ground line. Another symptom is wilting and death of new shoots during the growing season as a result of stem injury or girdling which occurred during the previous winter.

This type of injury is common on evergreen varieties which are planted north of their normal range of distribution. Low-temperature injury can be avoided to some extent by selecting plants which have been grown locally for one or more years and by avoiding any practice, such as early fall fertilization, which will tend to delay maturation or hardening of tissues.

Needle drop is quite common on some evergreens, particularly spruce, fir, and hemlock, and to a lesser extent on pines and yews, as a result of climatic shock or adverse growing conditions. Protection of sensitive plants from winter injury by mulching, watering, and selecting protected planting sites are the most practical and effective control measures for this type of injury.

Wounds or breaks of any type on plants provide entrance for disease and insect pests and result in weakened tissues which are more susceptible to attack by parasitic organisms. Even a small wound or scar on the stem of a sensitive plant such as a yew can cause the injured stem to weaken or die. All ornamental plants should be handled with care to prevent mechanical injury, and all wounded branches

(Continued on page 38)

## Insect Report

\*\*\*\*\*

WTT'S compilation of insect problems occurring in turfgrasses, trees, and ornamentals throughout the country.

\*\*\*\*\*

### Turf Insects

#### A BILLBUG

(*Sphenophorous venatus vestitus*)

**Florida:** Adults, probably this species, active at night and causing very light damage to zoyia grass golf greens in Miami, Dade County.

#### GRASS BUGS

**Utah:** *Irbisia pacifica* ranges 25-300 per sweep on severely discolored Great Basin wildrye at Beaver Dam, Box Elder County. *Irbisia* sp. badly discolored 200 acres of intermediate wheatgrass at 7,000 feet elevation above Peterson; this area severely damaged in 1966.

#### A MILLIPED

(*Pleurolooma brunnes*)

**Arkansas:** Taken in st. augustine-grass in Desha County. This is same species that has been very heavy in city of Paragould, Greene County.

#### TWO-LINED SPITTLEBUG

(*Prosapia bicincta*)

**Alabama:** First adults noted throughout central and southern areas. Becoming common on lawn and other grasses; no damage reported.

### Insects of Ornamentals

#### BAGWORM

(*Thyridopteryx ephemeraeformis*)

**Oklahoma:** Heavy on juniper at Stillwater, Payne County, and Perry, Noble County; moderate in Beckham and Cleveland Counties.

#### SPIDER MITES

**California:** *Eurytetranychus buxi* heavy on boxwood hedges generally in Ontario, San Bernardino County. *Tetranychus telarius* medium on boxwood nursery stock in Escondido, San Diego County.

#### A FLATID PLANTHOPPER

(*Anormenis septentrionalis*)

**Alabama:** Numerous nymphs feeding on new growth of azaleas, camellias, dahlias, and many other plants throughout southern, central, and much of northern areas; damage not serious. Growers and homeowners concerned for several weeks in Mobile, Lee, Bibb, Franklin, Winston, and other counties. Mostly adults as far north as Winston County.

#### ARMORED SCALES

**California:** *Hemiberlesia lataniae* adults heavy on Japanese maple nursery stock in San Diego, San Diego County. **Florida:** *Pinnaspis aspidistrae* adults severe on 15 percent of 2,000 liriope plants at nursery in Dover, Hillsborough County.

#### GLOBOSE SCALE

(*Lecanium prunastri*)

**Delaware:** Young crawlers on ornamental plum in New Castle County area.

#### WEEVILS

**Maryland:** *Apion longirostre* adults heavy on hollyhock at University Park, Prince Georges County. **Rhode Island:** *Brachyrhinus sulcatus* pupating in North Kingstown, Washington County.

### Tree Insects

#### A SHIELD BEARER

(*Coptodisca* sp.)

**Arizona:** Larvae severely defoliated many cottonwood trees in Yuma and Maricopa Counties.

#### BLACK TURPENTINE BEETLE

(*Dendroctonus terebrans*)

**Alabama:** Adults and larvae active on isolated pine trees in Lee, Baldwin, and other counties.

#### ENGRAVER BEETLES

(*Ips* spp.)

**Maine:** Numbers and damage of *I. pini* heavy on white pine at Falmouth Foreside, Cumberland County; injured trees transplanted last fall. Heavy sap flow prevents insects from being established. **Nebraska:** Heavy in Nebraska National Forest near Halsey.

#### ELM BORER

(*Saperda tridentata*)

**North Dakota:** Heavy larval populations damaged elm at Walhalla, Pembina County; pupae present.

#### CANKERWORMS

**New York:** Peak descent from trees at Riverhead, Suffolk County. Numbers medium in Nassau County. **Pennsylvania:** Mainly *Alsophila pometaria* heavily defoliated oak and other hardwoods at Schickshinny, Luzerne County.

#### TENT CATERPILLARS

(*Malacosoma* spp.)

**Maine:** *M. americanum* infestations and damage evident in most areas. **New Hampshire:** Pupating at Durham. **Utah:** *M. disstria* damaged bitterbush, serviceberry, chokecherry and wild rose in ranch area of Blacksmith Fork Canyon, Cache County.

#### A SPIDER MITE

(*Oligonychus milleri*)

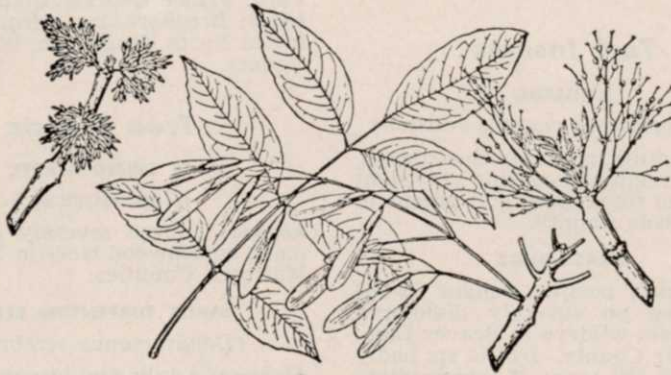
**Missouri:** Collected and det., at Columbia, Boone County. Light to heavy on new growth of shortleaf pine.

Compiled from information furnished by the U. S. Department of Agriculture, university staffs, and WTT readers. Turf and tree specialists are urged to send reports of insect problems noted in their areas to: Insect Reports, WEEDS TREES AND TURF, 1900 Euclid Ave., Cleveland, Ohio 44115.



## WHITE ASH

(*Fraxinus Americana*)



Drawing from: Manual of the Trees of North America, by Charles S. Sargent, Dover Publications, Inc. Reprinted through permission of the publisher.

Prepared by J. H. Kirch, forester and horticulturist serving as Marketing Manager, Industrial Chemicals, for Amchem Products, Inc.

The genus *Fraxinus* includes about 60 species of trees and shrubs found mostly in the temperate regions of the Northern Hemisphere and also in the tropical forests of Java and Cuba.

White ash, also known as Canadian ash, is the most abundant and important of the American ashes. It is found growing on deep, moist, fertile soils from Minnesota to Texas and east to New Brunswick and Florida. It grows to 80 feet in height and reaches a diameter of 2 to 3 feet. The bole is long, straight and clear. The wood is used in the manufacture of furniture, but is known most for its usefulness in sporting equipment such as baseball bats and rockets.

White ash is probably one of the most chemical-resistant species found in North American rights-of-way. After a clearing operation, usually two or more sprouts develop from each stump. These sprouts grow very rapidly, sometimes as much as six feet in one year.

White ash is readily recognized by its opposite compound leaves about 10 inches long, with 5 to 9 leaflets. The leaflets are 3 to 5 inches long, about 1½ inches broad, slightly serrate on the margin, and have definite pedicels or stalks at the base. When full grown, the leaf is usually smooth and dark green above and pale below. Separating white ash from its closely related species, green ash (*Fraxinus pennsylvanica*), is often a problem on the right-of-way. It can be distinguished from green ash by its smooth leaves and twigs. Those of red ash are often pubescent. The leaf-scars of white ash are markedly indented across the top while those of green ash are fairly straight with at most only a slight indentation. The seeds of white ash have wings fastened only to the apex of the seed while the wings are fastened to the apex and extend down over the sides of green ash.

Both species are readily distinguished from black ash (*Fraxinus nigra*) by their stalked leaflets. Black

Whether a plant species is desirable or undesirable often depends on the situation in which it occurs. This is true of all the trees to be discussed in this series of articles on identification. For example, maple (*Acer rubrum*) is a useful ornamental in landscape plantings because of its early red flowers, pleasing growth habit, and spectacular autumn foliage coloring. It is a nuisance on the right-of-way because of its resistance to chemical treatment. Similar comments could be made about the other species to be described. They have ornamental, and economic value, but not on a utility right-of-way which must be kept clear of tall vegetation. Strong resistance to treatment makes it especially important that a few "problem" species be clearly recognized when they are encountered in clearance work. Otherwise there may be needless disappointment, and waste of time and material through inappropriate treatment. J. H. Kirch.

ash leaflets are sessile. Also, the wings on the seed of black ash usually cover the entire seed. The buds of white ash are usually obtuse and brown, while those of black ash are acute and black.

The above species of ash are often found with blue ash (*Fraxinus quadrangulata*) particularly in Ohio, Indiana, Illinois, Kentucky, and Michigan, but are easily separated by the characteristic four-angled stem of blue ash.

Most ash species are controlled by dormant applications of brushkiller mixtures of 2,4-D and 2,4,5-T or 2,4,5-T alone in oil. Applications are generally made with the basal spray or dormant cane technique. Water-borne foliar applications of 2,4-D and 2,4,5-T are not as effective as dormant oil sprays. Water-borne foliage sprays of amitrole have been effective in controlling white ash, but less effective on green, blue and black ash.

Helicopter applications of most available chemicals have not controlled white ash. Recently the addition of amitrole or monosodium methane arsonate to the water phase of 2,4-D/2,4,5-T invert emulsions has offered some promise for heavy stands of white ash on the right-of-way.

Where ash and maple species are found with root suckering species such as black locust (*Robinia pseudacacia*) and sassafras (*Sassafras albidum*) on the right-of-way, a program of helicopter invert sprays of 2,4-D/2,4,5-T followed by a ground-applied dormant cane spray one year later has given nearly complete kill.



## Classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 1900 Euclid Avenue, Cleveland, Ohio 44115.

Rates: "Position Wanted" 5¢ per word, minimum \$2.00. All other classifications, 10¢ per word, minimum \$2.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment.

### FOR SALE

1 **LXCA 60-GPM HARDIE** with 500-gal. tank, hose reel with approx. 300 ft. of hose. Self-powered with 6-cyl. Waukesha engine. Unit mounted on 1½-ton '57 Dodge. With or without truck, \$3,100.00. 1 **LXCA 60-GPM Hardie** with 1,000-gal. round tank. Self-powered with large 4 cyl. International UD-9 engine skid mounted. One hose reel unattached with unit. \$3,500.00. Fred Vallarelli, Northeast Spray Service, 4935 E. 1st Ave., Hialeah, Fla.

2-100 gal. **Hardie Towne & Country** sprayers, \$200.00. 1-50 gal. **Hardie Towne & Country** Sprayer, \$150.00. 1-100 gal. **Hudson Matador** sprayer, \$150.00. All on skids with 150-ft. ¾" hose. Azo Chemical Co., 715-9th St., N.E., Canton, Ohio.

**Weeds Trees and Turf  
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### McCulloch Introduces Self-Starting Chain Saw

The McCulloch Corp., Los Angeles, Calif., has recently introduced what it calls the world's first electric-starting chain saw. For the first time, according to McCulloch, a small, hand-held gasoline engine can be started electrically by a totally self-contained starter, generator, and battery.

The electric-starting MAC 3-10E chain saw weighs less than 15 lbs., and is designed for tree trimming, land clearing, and felling and bucking timber and pulpwood. Easy starting of the saw while the operator is working in a tree or other precarious location is an important safety factor, McCulloch explains. Electric-starting components are the starter-generator, integrated into the flywheel of the engine; the nickel-cadmium battery pack, contained in the handle of the

saw; and the solid state voltage regulator, concealed in the pistol grip.

Another feature of the MAC 3-10E is a de-stroking port, which the company claims enables the engine to be started with half the effort required for an ordinary engine. McCulloch Corp., 6101 W. Century Boulevard, Los Angeles, Calif. 90045, will provide further details on the electric-starting chain saw.

### Tree Disease Damage Spotted From Air

Infrared color photography is now being used to spot diseased trees from the air.

University of Minnesota researchers Merle Meyer and David French explain that infrared light waves are reflected by healthy, summer foliage as bright, raspberry red. Off color foliage appears blue to green on the film. The film picks up damage which the eye many times fails to spot.

Black spruce stands infected with dwarfmistletoe stand out as bright blue-green. Trees with Dutch elm disease and oak wilt have been spotted which defied detection at ground level.

Research is continuing, particularly to determine the best altitude for flights and the prime times of the year for detection. To date, flight levels of about one mile appear best and summer foliage must be photographed before changing color in the fall. The research also indicates that this type detection may be helpful in spotting crop diseases. Meyer reports that the technique was used to identify water levels and soil moisture at the Carlos Avery wildlife refuge in Minnesota last summer.

### Antibiotic Effect Possible

Suggestions have been made, according to Dr. Philip L. Rusden, plant pathologist at Bartlett Tree Research Laboratories, that mulches may produce an antibiotic effect on trees. They may help arrest certain diseases. Research is now underway by the Bartlett Lab to determine if this is the case.

## Advertisers

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### John Bean Introduces Two Ground Sprayers

The Royalette 1010, a general purpose grounds sprayer that features a 100-gal. tank with mechanical agitation, and the Trojan 2025 small estate and park sprayer, have joined the line of spray equipment from the John Bean Division, FMC Corp.

Royalette, intended for weed and pest control on turf and shade trees, is said to be a complete spray unit with PTO drive and is designed to be mounted on a Cushman Truckster or light truck bed. Chemical can be applied with hose and gun or with the three-section 15-ft. boom that has 10 in. nozzle spacing. A 10 g.p.m. positive displacement, plunger-type pump provides pressures up to 400 p.s.i.

Trojan, claimed to be ideal for spraying weeds, shrubs, trees, lawns, and mosquito-infested areas, has a 20-gal. porcelainized steel tank and a self-lubricating, fiberglass pump with only one moving part. Trojan delivers a constant spray of 3 g.p.m. at 60 p.s.i. and is also available with 10-gal. tank and with boom. Spray gun unit is equipped with 15 ft. of hose.

John Bean Division, Box 9490, Lansing, Mich. 48909, offers further data on these and other sprayers in its line.

## Meeting Dates



**Penn State 1967 Field Day**, Pennsylvania State University, University Park, Aug. 16-17.

**Nursery and Garden Supply Show**, Texas Association of Nurserymen Annual Convention, City Auditorium, Austin, Aug. 20-23.

**International Shade Tree Conference, 43rd Annual Convention**, Marriott Motor Hotel, Philadelphia, Pa., Aug. 27-31.

**National Arborists Association Annual Meeting**, Marriott Motor Hotel, Philadelphia, Pa., Aug. 27-31.

**American Society for Horticultural Science, Annual Meeting**, Texas A. & M. University, College Station, Aug. 27-Sept. 1.

**Annual Turfgrass Field Days**, Virginia Polytechnic Institute, Blacksburg, Va. Noon Sept. 6-Noon Sept. 7.

**Annual Turfgrass Short Course, Ala.-Northwest Florida Turfgrass Association**, Auburn University, Auburn, Ala., Sept. 7-8.

**Lawn and Ornamental Days**, Ohio Agricultural Research and Development Center, Wooster, O., Sept. 12-13.

**Pacific Northwest Spraymen's Association, Annual Conference**, Seattle Center, Seattle, Wash., Sept. 15-16.

**Northwest Turfgrass Conference, Annual Meeting**, Harrison Hot Springs, British Columbia, Sept. 19-21.

**National Agricultural Chemicals Association, Annual Meeting**, Holiday Inn, Palm Springs, Calif., Nov. 5-8.

**American Society of Agronomy, Annual Meeting**, Sheraton-Park and Shoreham Hotels, Washington, D. C., Nov. 5-10.

**Texas Fertilizer Association's 1967 Agricultural Exposition**, KoKo Inn, Lubbock, Nov. 9-10.

**Fertilizer Industry Round Table, 17th Annual Meeting**, Hotel Mayflower, Washington, D. C., Nov. 15-17.

**Entomological Society of America, Annual Meeting**, Hotel New Yorker, N.Y.C., Nov. 27-30.

**National Fertilizer Solutions Association, Annual Convention**, Denver-Hilton Hotel, Denver, Colo., Nov. 28-30.

**National Aerial Applicators Association, Annual Conference**, Marriott Hotel, Dallas, Tex., Dec. 3-5.

**North Central Weed Control Conference**, Civic Auditorium, Fargo, No. Dak., Dec. 5-7.

**Ohio Turfgrass Foundation Turfgrass Conference**, Sheraton-Cleveland Hotel, Cleveland, O., Dec. 11-13.

## Evergreen Diseases

(from page 35)

should be removed and the wounds treated with wound dressing.

Ice storms which cause thick deposits of ice to form on branches occur occasionally in the Midwest. The ice itself does not usually cause damage, but the extra weight can result in twig or branch breakage. Fortunately, ice damage is rare for little can be done to prevent it. Ice injury should be treated like any mechanical injury on evergreens. Injured plants should be pruned, watered, and fertilized; and wounds should be painted with wound dressing.

In addition to the diseases and other types of damage already mentioned, there are many troubles of evergreens for which the causes are unknown; and other problems are continually arising. Evergreen diseases have not received the attention that diseases of other plants have had; and much research is needed to solve not only the new problems which arise, but also some of the problems which have been with us for many years.

## Aquatic Vegetation Control

(from page 18)

at commercial use of water hyacinths have had little success to date, he reported.

Officers elected for the new year by the Society which met June 18-21 are: Robert D. Blackburn, research botanist for the Crops Research Division, USDA, Fort Lauderdale, Fla., president; James Gorman, who served this past year as president, vice-president; Paul R. Cohee, technical sales representative for Hercules Incorporated, Orlando, Fla., secretary-treasurer; and Dr. Lyle Weldon, research agronomist, Crops Research Division, USDA, Fort Lauderdale, Fla., reelected as editor. Directors for the coming year are: Frank Wilson, Polk County Mosquito Control Unit, Eaton Park, Fla.; Dr. F. W. Zurburg, University of Southwestern Louisiana, Lafayette, La.; and Fred W. John, Southern Florida Conservancy District, Belle Glade, Fla.

## Trimmings

**Greenskeeper Knows His Turf.** A stolen golf green at Teigmouth, Eng., turned up as a new lawn at the home of Ivan Hitchcock who, incidentally, is now serving 3 years probation for the theft. Greenskeeper Edward Yeo said he had no trouble spotting his green because there was no other turf in the area like it.

\* \* \*

**Elm Blight On Run.** Kansas City lost 13,200 elms from Dutch elm disease in 1963 which was 10% of the city's elm population. The city then hired Frank Vaydik, Detroit forester, who started a 3-pronged program in which diseased trees were removed as quickly as possible, dead or dying branches trimmed, and the 100,000 elms of the city sprayed yearly. Result was a loss of only 4578 trees in '64, 3744 in '65 and only 2912 last year, cutting losses to less than 3%. At the same time 7000 new trees are being planted each year to replace former elm loss.

\* \* \*

**Irrigation Protects Against Hot and Cold Weather.** Researchers now tell us irrigation can protect crops from frost damage. Seems that in the freezing process, water releases heat. A pound of water gives off 144 BTU's of heat. The increased moisture in the air serves as a blanket and reduces the amount of heat given off by the crop through radiation. Crops can be protected down to 20° temperatures by irrigating. During hot weather, light irrigation can be used to cool crops when temperatures are above 85° F. And all the time we thought irrigation just guaranteed the proper transpiration rate.

\* \* \*

**Big Business.** Virginia Tech researchers at Blacksburg point out that weed control accounts for heavy spending throughout the state. They estimate that weed losses cost citizens \$14 million in lawns and \$11 million in industrial sites and rights-of-way every year.

\* \* \*

**"Grass" Contract to Monsanto.** We hear that Monsanto Chemical Company was just awarded a \$174,468 contract to install synthetic grass on the Memorial High School Stadium football field at Seattle, Wash. Monsanto's bid was accepted over a lower bid of \$162,000 by virtue of a 5-year guarantee. Gate receipts plus stadium parking and rental fees will finance the installation. At the price, it has to be superior to Kentucky blue.

\* \* \*

**Customer Credit.** J. R. Stiffler of Borden Chemical offered his company's dealers a bit of timely advice in a recent newsletter. He urged them to arrange for customers to charge for purchases in order to increase sales. Stiffler says a number of dealers don't like the idea of the collection fee, but he feels that customers understand that the merchant has to be reimbursed for a direct charge or markup. Stiffler points to bank credit cards as a popular type aimed at practically every type of business. Seems to us it might be a good step for the service segments of the vegetation control industry.



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