

WEEDS

TREES

and TURF

A TRADE MAGAZINES PUBLICATION

JULY 1967

Final:
Turfgrass
Management
Training, P. 12

**Growing
Vigorous, Strong
Root Systems
On
Cool Season
Turf, P. 22**



**Chemicals
Cut Roadside
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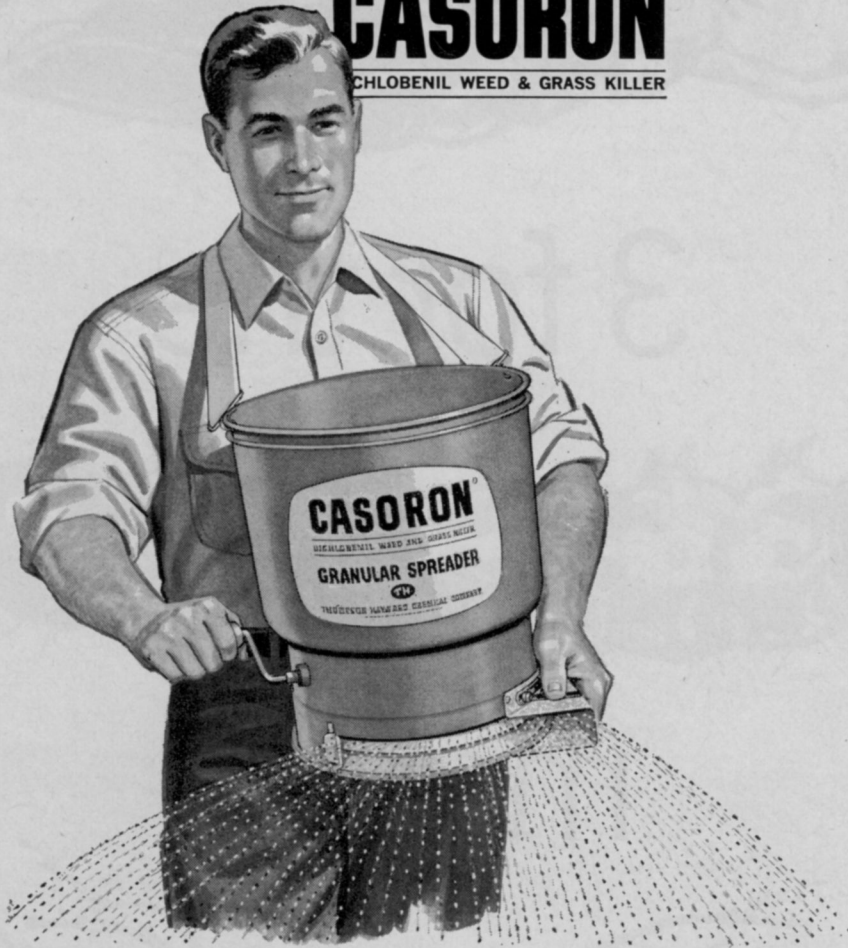
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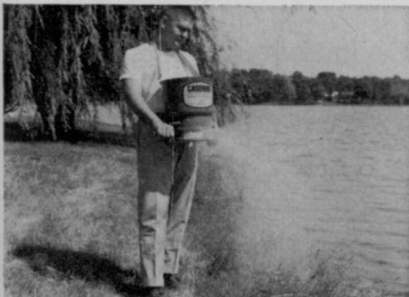
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WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

July 1967
Volume 6, No. 7

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WEEDS TREES AND TURF is published monthly by Trade Magazines Division, Home State Farm Publications, Inc. Executive, editorial, and advertising offices: 1900 Euclid Ave., Cleveland, Ohio 44115.

Single Copy Price: 50 cents for current issue; all back issues 75 cents each. Foreign \$1.00.

Subscription Rates: U.S. and possessions, 1 year \$3.00; 2 years \$5.00. All other foreign subscriptions 1 year \$4.00; 2 years \$7.00. **Change of Address:** Three weeks advance notice is necessary for change of address. Both old and new address must be given. Post Office will not forward copies. Third Class postage is paid at Fostoria, Ohio 44830.

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Who Are the Decision Makers?

Who sets the buying policy in your company? Owner-operator, absentee owner, president, vice-president, various supervisory employes, purchasing agent, foreman, or who?

We find it interesting that buying policy varies so much among the various facets of the vegetation maintenance control fields served by WTT. For example, we've talked with owners who wouldn't consider a major piece of equipment unless their men tried it out on the job. Others say they depend a lot on the name of the manufacturer and the reputation established through the years.

This latter policy is difficult to maintain today because of the wealth of new machines and equipment built as specialty items by small manufacturers or by operators new in the business who have developed a specialized piece of equipment. When such is the case, can you afford to gamble on the equipment, or do you check it out carefully. Perhaps a trial run at your own site, a demonstration, or a check with someone in the business who is using the equipment is your best bet. Maybe you feel a newly produced machine by a new manufacturer is too great a risk. But if it is a good piece of equipment, and designed to do your special job, the biggest gamble may be the loss of efficiency you experience by not buying the equipment.

Because much equipment constitutes a major expense which must be written off over a number of years, a firm hand and a definite policy become musts in making the decision. Here is where experience and judgment count. And it is at this point that you, as owner or manager or purchasing agent, prove your value, whether to yourself as owner or to your company as employe.

Combine your judgment with a written agreement from the manufacturer, distributor or dealer and you assume less risk. Few operators can afford to make mistakes on major equipment and remain in business. Impulse buying has little place in the industries served by WTT. Most are contract operators who operate with narrow margins. Few businesses are measured as rigidly as the contract applicator, tree care man, or turf specialist. If the weeds show up, the tree dies, or the turf fails to stand the traffic, then there is no question as to where the buck stops.

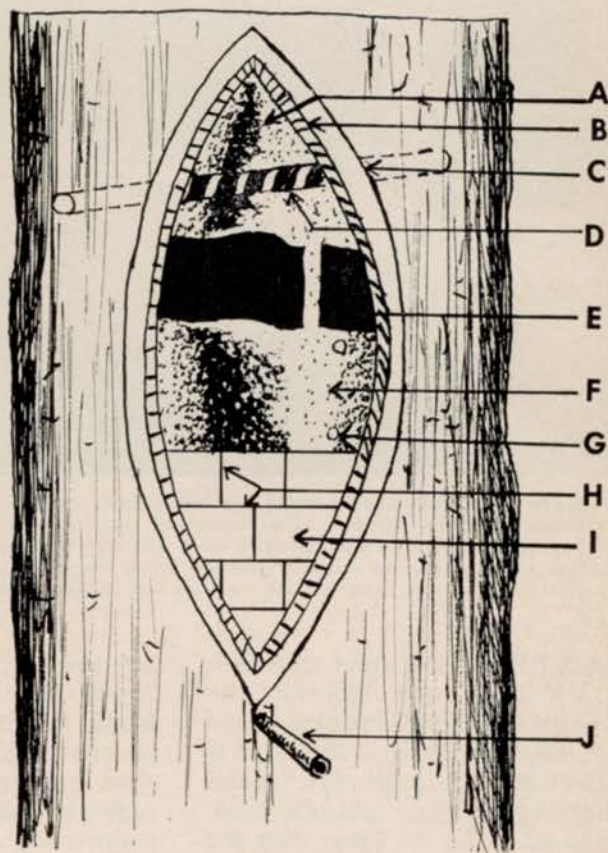
If we have any advice to the specialists we serve, it is to rely on your own judgment and experience to investigate new equipment carefully and try it out under your own conditions. Be sure you can effectively utilize the equipment when it is delivered and couple this with the maker's or seller's guarantee.

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.

TREE CAVITY WORK

needs to be based
on judgment
of the professional

Filling a cavity is a step-by-step procedure. Shown in the illustration are the common steps and materials: A. Sapwood; B. Cambium and bark; C. Shellac cambium; D. Screw rod bracing; E. Asphaltum paint; F. Felt asphalt layer; G. Tacks; H. Asphalt or tar paper; I. Sectional filling; and J. Drainpipe.



TREE cavity work, properly done by the professional, can add years of life to a tree. But with old, weakened trees, it is often a questionable practice. Whether to fill the cavity depends on the good judgment of the tree care specialist. He relies on experience and also considers the worth of the tree in its particular location.

Veteran tree men know when old, slow-growing trees with advanced decay are better left alone. Good rolls of callus growth around large cavities are strong. Removing callus rolls may weaken a tree structure and actually interfere with an important means of sap flow. Such trees can best be treated by bracing the cavity area and fertilizing the tree.

Only vigorous trees should be

treated. When trees are weakened by changes in grade, excision of roots, gas leaks or chemical injury, cavity filling needs to be delayed until the tree overcomes the condition causing loss of vigor and is again in a healthy state. Experience is the greatest help in deciding whether to fill the cavity.

Filling of cavities is seldom done on such trees as gray birch, white birch, cherry, chestnut, black locust, mountain ash, or Lombardy poplar. Only the most vigorous of trees among catalpa, poplars other than Lombardy, willows and old specimens of black oak and silver maple should be treated. For example, in Maine*, linden and maple having cavity treatments after early to mid-September often have the bark around cavities

killed back, or the fillings forced out. Normally, it is unwise to do cavity work in maples during the dormant period.

When the decision is made to fill the cavity of the tree, proper tools are needed. These include sharp chisels, gouges and knives. Diseased areas need to be treated by removing all decayed material back into sound, normal wood. It is almost impossible, without structurally weakening a tree, to remove all the fungus strands. These may extend well beyond the visible margin of decay. However, shallow sapwood decay or decay in small branch stubs can generally be eliminated. Exterior shape of the excavation needs to follow the natural lines of sap flow. If the bottom of the cavity is near the

(Continued on page 17)

Chemicals

By S. L. HOCKERSMITH

Eugene, Oregon



Steve Puett, Lane County Weed and Brush Supervisor, field surveys county roads and highways before setting up season's spray schedule. Tour helps develop workable schedule which will catch most weeds when they are susceptible to chemical spraying. Survey also helps spot adjacent crops and time spraying when these are less apt to be damaged.

"WEEDS are great travelers, they are indeed the tramps of the agricultural world . . . like other tramps they find it safest by the highways," John Burroughs, author and naturalist, once said. "In the fields they are intercepted and cut off, but on the public road every boy, every passing flock of sheep or cows gives them a lift."

This statement becomes obsolete as state and county highway agencies turn to chemicals to wipe out these "tramps of the agricultural world." Oregon's Lane County, a county that stretches from the Pacific Coast to the Cascade Mountain Range, is one agency that is quietly but systematically eradicating this tramp—the roadside weed.

Actually, when we talk about roadside weeds, we are talking about more than just Canadian thistles or morning-glories. Roadside weeds include blackberry vines, cattails, trees, or anything else which grows in the right-of-way and thus interferes with either the beauty of the area or the visibility from the road.

There are numerous reasons

for keeping our highways free from the clutter of roadside weeds and brush. A high growth of brush along the edge of the road has caused a great many highway accidents. A deer, a pedestrian, or even another car are hidden from a motorist's sight by tall roadside weeds. The removal of the weeds and brush makes the area look cleaner; it enables tourists to enjoy scenery

that might otherwise be hidden by the tall brush along the edge of the road. By keeping drainage ditches clear from weeds and brush that tend to clog them so that they overflow onto the road, road maintenance costs are greatly reduced. Clean drainage ditches are important to both the Lane County Public Works Department and to property owners whose fields and yards might

Prior to spraying season, Lane County's three spraying trucks and equipment are serviced. Puett checks largest unit used on county highways and roadways.



Cut Roadside Clearing Costs For Lane County, Oregon

be flooded if ditches were clogged. Fire danger is, of course, reduced when weeds are removed. There is not nearly the fire hazard present in weeds and brush that have been eradicated by chemicals that there is to vegetation that has dried up from lack of water or because it is the end of the growing season. For the county there is the added bonus of good will, and often cooperation, between the Public Works Department and the farmer who tries to keep his fields free from weeds.

Spraying is Efficient

For efficiency in cleaning weeds and brush from roadside rights-of-way, Lane County has found an answer in the use of chemicals. Lane County, as one of the first organizations to experiment with a complete spraying program, has gained recognition from other counties within Oregon and in other states. It has even had requests for reports on spraying success from 2 foreign countries.

Spraying is both cheaper and faster than the mechanical method for clearing roadside weeds and brush. For example, Lane County had both spraying crews and brush crews clearing roadside areas last summer. The brush crews worked in areas not previously sprayed including new roads and in areas where the spray might endanger a tree or landscaping that should remain. By comparing the work accomplished in these two methods for clearing rights-of-way,

Weed and Brush Supervisor Steve Puett found that four men were able to spray 71 miles per month while the 4-man crew that was clearing brush by using graders and caterpillar tractors was able to clear only about 2¼ miles per month. The difference between 71 miles a month and 2¼ miles a month becomes significant in a county with more than 1400 miles of county roads to be maintained. Public Works Director Gerald Attig explains that since Lane County has been spraying, the roadside clearing work is done so much more quickly and easily that the Public Works Department has been able to devote much more time to more important things. Prior to the spraying program the Public Works Department had to spend so much time clearing

roadside brush that there was very little time to devote to anything else.

In the 9 years that Lane County has been using chemicals for roadside brush control, it has been able to make the road clearing program an annual accomplishment on all the major county roads. Nearly all other county roads are sprayed at least every 2 years. This tends to speed up the time required for clearing brush and weeds because they do not have the opportunity to return unchecked year after year. With the mechanical brushing techniques it was often years from the time a road was cleared until it could be cleared again. This makes a considerable amount of difference in an area where weeds and trees grow rapidly. Along the coast

Hand labor for weed and brush control is largely eliminated today in Lane County. Chemicals handle the job around guardrails and posts quickly and do the job at a lower cost.





Bridge abutments, culverts, sign posts, and similar areas previously inaccessible to power equipment are easily covered with chemical spray equipment. Lane County costs approximate 63¢ per structure to spray.

in Lane County, for example, an alder tree will grow as much as 6 feet a year. At that rate, if the tree is not sprayed within 1 or 2 years, county crews would find themselves removing a large tree after just a few years of neglect.

Primarily as a result of the decrease in the time required for clearing weeds, the county has been able to cut costs considerably. Whereas it would cost from \$400 to \$500 a mile each year to reshape ditches and clear weeds and grass by mechanical means, in 1966 it cost \$19.60 for each mile (\$5.63 an acre) of road sprayed for summer foliage. The cost for the early spring sterilization program in 1966 in Lane County was \$92.40 per mile (or \$30.80 per acre) for sterilizing areas that had not previously been sterilized and \$65.41 per mile (or \$21.80 per acre) for maintaining areas that are sprayed each year. Lane County's program over the past 9 years has been one of progressively enlarging the maintained area until all 1400 miles of road are included.

Experimentation with the sprays has shown Lane County the importance of paying strict attention to such things as the careful selection and timing of roads to be sprayed, attention to the proper use of pump pressures in spraying, and awareness of the weather conditions and

wind and their possible effects at the time the spraying is done.

Early Spraying Is Best

The best results in killing weeds and brush, Lane County has found, are obtained in the early part of the season when the leaves of the plants are young. As summer comes and the foliage reaches full maturity it becomes necessary to use larger quantities of the spray and, therefore, to increase costs.

The county has 3 major areas within its roadside spraying program. Early in the spring ditches are sterilized to prevent new growth, in the summer foliage spraying is done, and later in the summer noxious weeds such as poison oak and berry vines are sprayed.

The summer spraying program in Lane County actually begins in February. At that time field reconnaissance is done to select roads to be sterilized and to make up a schedule for spraying. Sterilization then begins the first part of March. The county, after experimenting with numerous chemicals and formulations, now uses two different formulations of chemicals in the sterilization of roads. One solution is used for roads that are to receive an initial application of the sterilants and a weaker mixture of the same chemicals is used for areas where spraying has been done previously. (See Table 1

Table 1. Formula for initial application for sterilization

Chemical	Lbs.
Atrazine	12 80W, plus 8 ounces X-77 surfactant per 100 gallons of water
Hyvar X	6 plus 8 ounces X-77 surfactant per 100 gallons of water
Simazine	12 80W, plus 8 ounces X-77 surfactant per 100 gallons of water

100 gallons of the above formulation will adequately treat one acre. If there is foliage within the area to be treated, one gallon of Amitrol-T is added to each 100 gallons of water.

for the formula used in areas not previously sprayed and Table 2 for the formula used when spraying has been done.)

By the end of April a field survey is made prior to beginning the summer foliage spraying program. This survey is made to determine the amount of spraying to be done, but more important than that, it attempts to organize the spraying program to coordinate it in relation to adjoining domestic crops so that it will not be necessary to spray next to a planted field at a time when that crop might be destroyed by drift from the spray blowing over the field. The formulation used for summer foliage is one gallon of 2,4-D and 2,4,5-T esters plus 8 ounces X-77 surfactant to 100 gallons of water.

In the middle of May the noxious weed spraying program begins with a field survey as in the other spraying programs. In Lane County, the Public Works Department coordinates its work with the Lane County Weed District. The county sprays rights-of-way for Canadian thistle, poison oak, and berry vines with Tordon 22K and Amitrol-T and the Weed District sprays areas

Table 2. Formula for maintenance application for sterilization

Chemical	Lbs.
Atrazine	6 80W, plus 8 ounces X-77 surfactant per 100 gallons of water
Hyvar X	3 plus 8 ounces X-77 surfactant per 100 gallons of water
Simazine	6 plus 8 ounces X-77 surfactant per 100 gallons of water

100 gallons of the above formulation will adequately treat one acre. If there is foliage within the area to be treated, one gallon of Amitrol-T is added to each 100 gallons of water.

outside rights-of-way with Amirtol-T. Later in the summer, conifers, cattails, and morning-glories are spot sprayed.

Lane County has a policy that requires any public utility cutting brush on a county right-of-way to obtain a permit which requires it to report that cutting to the county. When these reports are turned in to the Weed and Brush Department for the county, men are sent out to spray the stumps in order to halt any resulting new growth. For spraying stumps, the county uses a mixture of one gallon 2,4-D and 2,4,5-T esters to each 24 gallons of diesel.

Personal Contact Helpful

When Lane County first began spraying in 1958, there were many complaints from people who were afraid that either they or their livestock might be harmed by the chemicals. County officials launched into a public relations effort to combat public fear of the chemicals. The public relations program presently used by the county is basically the same as that begun in 1958. Printed literature designed to explain the safety of the chemicals used is carried in the trucks with the spraying crews. Thus, when someone questions the men who are spraying, they

have literature to hand out. Supplementing this literature program, of course, is the personal contact that people have with the men who do the spraying. Before these men are sent out to spray roadside brush, they are trained in the techniques of spraying, the value and purposes of the program, and the public relations and spraying policies of the Public Works Department so that they are able to answer many of the questions people might have. In addition, the Public Works Office receives numerous phone calls, thus enabling the office personnel to explain about the chemicals to people who have questions and complaints. The third area of the public relations program consists of an educational program aimed at groups that are interested in or affected by the use of sprays in their area. County officials are encouraged by requests to speak at Grange meetings, County Farm Bureau meetings, and Garden Club meetings. Partly as a part of the public relations program, and partly for their own records, the county has made it a point to take before and after pictures with colored slides.

Not all of the complaints were settled by public relations techniques, however. In addition to calls from people concerned

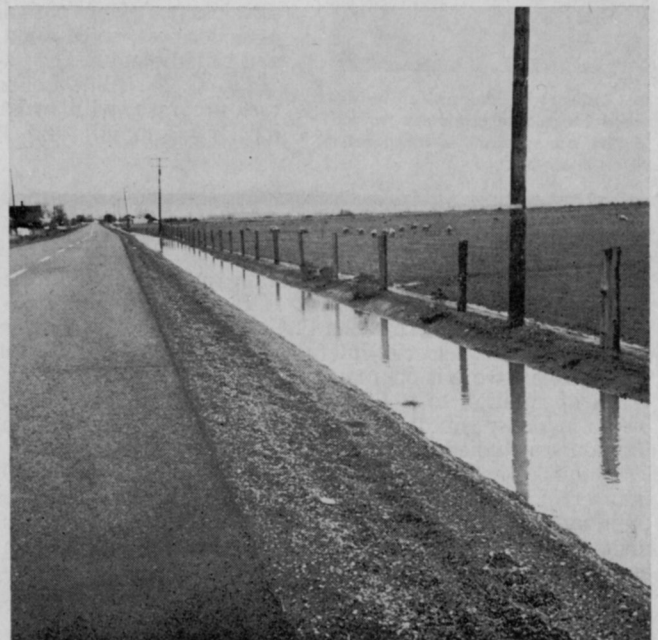
about their livestock when the spraying program was new in Lane County, there were also complaints from people whose crops or shrubs were damaged from spraying in the area. After the first year of spraying, the county found that pump pressures should seldom exceed 40 or 50 pounds per square inch. When pump pressures were reduced and wind and weather conditions were watched more carefully by the spraying crews, the complaints diminished. Many of the people who had previously complained about the spraying no longer realize that spraying is still being done in their neighborhoods. Drift is apt to result if there is a wind when the spraying is done. Volatility becomes a problem when there are changes in air currents, temperature, and humidity. These vapors are more apt to move on a still, hot day when air currents gently begin to circulate with changing temperatures.

By 1960, as a result of more experience and more caution regarding drift, volatility, pump pressures, and proper timing for spraying, very few complaints were reported. In fact, within 2 years there were many requests from people for more spraying or for advice on formulations and methods for doing their own work.

Neglected right-of-way such as this was common in Lane County prior to countywide spray program. Treated roadsides are not only more attractive, but have been found to be much safer.



Farm operators find contamination from roadway weed seeds a thing of the past where rights-of-way are regularly sprayed. Roadside above is one in Lane County and is typical of the area today.



Survey '67:

Turfgrass Management Training, Part 4

From "brushup" short courses to two-year technical programs, from four-year undergraduate courses leading to B.S. degrees to research-oriented postgraduate studies, colleges around the country are stepping up their turfgrass management training programs in the face of heavy demand for graduates. With this issue WTT completes publication of its series on this nationwide study.

University of Wisconsin, Madison, Wisconsin

Most students interested in turf are soils majors at the University of Wisconsin. The University offers no formal training program as such in the area of turf management. However, students are trained for turf management within the various majors offered in the College of Agriculture.

Dr. James Love of the Soils Department serves as advisor to students interested in turf management. Students majoring in Agronomy and Horticulture take courses offered by these departments plus those offered in botany, soils, entomology, plant pathology, and horticulture to gain their background in turf management. One specific turf management course is offered by the Department of Horticulture. Dr. Robert Newman, Extension Horticulturist, teaches a 2-

hour credit course in turf management and also a 5-week, non credit turf course for Wisconsin's annual agricultural short course. All students desiring to enter turf management have the benefit of on-the-job training during summers at golf courses of the state.

Tuition charges amount to \$162.50 per semester for Wisconsin residents and \$525 for non residents. A total of 12 students at the junior and senior level are now taking course work aimed at the turf management field.

Requests for information may be directed to Dr. James Love, Soils Department, University of Wisconsin, Madison, Wis. 53706 or to Dr. Robert Newman, Horticulture Building, University of Wisconsin, Madison, Wis. 53706.

University of Missouri, Columbia, Missouri



Dr. Delbert D. Hemphill: The demand for college graduates trained in turf management is far greater than the supply.

Turf training at the University of Missouri is being developed by the Department of Horticulture. Both 4-year undergraduate and graduate programs are offered in the curriculum. Degree offered for undergraduate training is a B.S. in Agriculture with a major in turf management. Dr. Delbert D. Hemphill who has helped develop the program reports that a course of study is developed to fit the needs of each student. All students are required to take courses in turfgrass management, chemistry, plant nutrition, plant physiology, plant pathology, plant ecology, business, soils, weed control, genetics and entomology.

Dr. C. W. (Bill) Lobenstein directs the turf program, with assistance in teaching by Dr. Hemphill and Professor Ronald

Taven. Other departments in the College of Agriculture are involved for courses other than those specifically within the Horticulture Department.

Initiated in 1966, three undergraduate students are currently enrolled in the new curriculum. Tuition is \$140 per semester with an additional cost of \$65 estimated for books and supplies. Requirement for entering the program is admission to the University. The fall semester begins in mid-September, 1967. A winter term will begin in late January of 1968. On-the-job training is encouraged in the program, but is not a requirement for the degree.

Direct requests for more information to Dr. C. W. Lobenstein, Department of Horticulture, University of Missouri, Columbia, Mo.

Cornell University, Ithaca, New York

Turfgrass management instruction and research is the responsibility of the Department of Floriculture and Ornamental Horticulture. Dr. John F. Cornman serves as advisor to students with a special interest in the field.

Graduate work is offered at both the Master's and Ph. D. levels in addition to a B.S. degree for the undergraduate. There is no specification on the diploma, however, as to the courses studied.

Requirements for the B.S. degree are general with 120 hours required for graduation. Of this total, 75 hours are electives. A student with particular interest in turfgrass management can take the 4 hours of specific instruction available plus supporting courses in horticulture and agronomy. Other material taken would likely include insect,

disease, and business management subjects. A student program is outlined with the interests of the particular student in mind.

Tuition costs vary somewhat, but college of agriculture students who qualify as residents of New York State pay \$200 per term with out-of-state students paying \$300. Admission to Cornell is difficult unless students have demonstrated superior academic ability and interest at the high school level. Application should be made by March 15 of the year in which entrance is required. Applications after this date are considered only if space is available.

For detailed information regarding turfgrass management training direct inquiries to Dr. John F. Cornman, Plant Science Bldg., Cornell University, Ithaca, N.Y. 14850.

University of Florida, Gainesville, Florida



Dr. G. C. Horn: Opportunities for the career-minded turf management graduate are excellent. This field from this standpoint is the best area in agriculture today.

At the University of Florida, turf training is administered by the Department of Ornamental Horticulture. The program, directed by Dr. G. C. Horn, Associate Turf Technologist, offers a 4-year program leading to a bachelor's degree. A Masters degree in turf management is also offered. Further work leading to Ph.D. degrees is handled in cooperation with other departments.

Majors in turf management are required to take 27 hours of courses in Plant Science plus 15 elective hours in Plant Science, Agronomy, Fruit Crops, Ornamental Horticulture and Vegetable Crops. In addition, 19 hours in Ornamental Horticulture are required. These latter hours include courses in Basic Plant Materials, Turf Management, Nursery Operation, Floriculture, Advanced Turf Management, and Special Problems. On-the-job training is also a requirement.

This Florida program was started in 1947 by Dr. Roy A. Bair. Currently there are 14 students enrolled which is a record number for the program.

Entrance requirements for freshmen include being a graduate of an accredited high school, 12 academic units of English, foreign language, math, science, and social science, a "C" average in all academic courses, a score in the top 40% (total score of 300) in Florida's 12th grade tests, and a record of good conduct. Tuition was \$130 per trimester for Florida residents, and \$330 for out-of-state students. Florida is now on a quarter system, dates of which may be had by contacting the Registrar at the University of Florida.

For complete information, write Dr. G. C. Horn, Department of Ornamental Horticulture, 404 Newell Hall, Gainesville, Florida 32601.

University of Rhode Island, Kingston, Rhode Island



Dr. C. R. Skogley: We could place more graduates. We are contacted by many golf clubs and commercial companies for those who graduate.

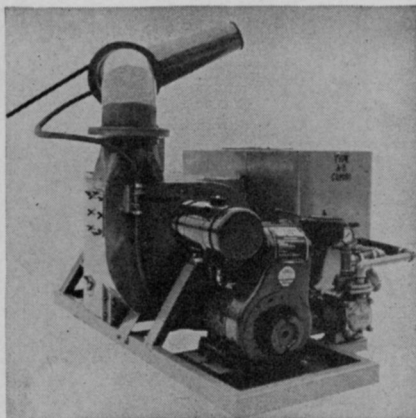
Turf training at the University of Rhode Island comes under the Department of Agronomy and Mechanized Agriculture. Dr. Robert C. Wakefield is department chairman, and Dr. C. R. Skogley is principal advisor for turf students.

Programs offered are four-year undergraduate and graduate studies. Work towards a B.S. degree falls in one of two undergraduate curriculums: agricultural science for students wishing more intensive training in basic sciences leading to graduate work; and Agricultural Technology, a curriculum less intensive in basic sciences and which may be more practical in nature. Graduate programs are directly under supervision of agronomy department staff members; courses are taken in such areas as agronomy, soils, botany, biochemistry, statistics, etc., with specific emphasis on thesis research in turf.

Begun in turf research, the Rhode Island program continues to emphasize research. According to Dr. Wakefield: "We have

one of the oldest, and, we have been told, one of the most comprehensive research programs found anywhere. Our training program for students is a relatively small one, but, we hope, a good one since the research staff and research facilities provide an unusual opportunity for students to learn by association." Turf teaching staff includes Dr. C. R. Skogley, Dr. D. T. Duff, Dr. R. S. Bell, Dr. R. C. Wakefield, and J. A. Jagschitz. A two-year training program is in the advance planning stage, and is hoped to be in operation by Sept. 1968.

Requirement for entering this program is satisfactory college preparatory work in high school plus entrance exams. Rhode Island residents pay no tuition; nonresidents pay \$600. per year. Graduate assistantships are available. Courses convene in September, with April the application deadline. Inquiries should go to Director of Admissions, Administration Building, University of Rhode Island, Kingston, R.I. 02881.



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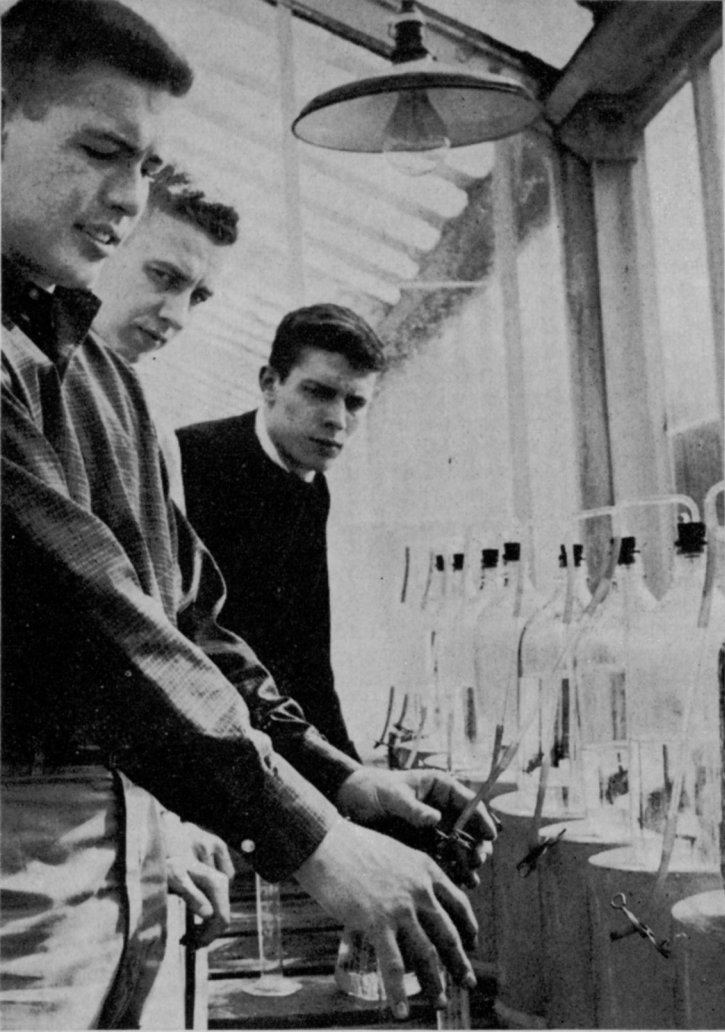
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Turfgrass Management

**A University Field
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For the Industry**

**Panorama of Iowa State University Turf
Training Presented By Eliot C. Roberts**

Laboratory exercises include work with nutrient solutions used in turfgrass culture, above. Students also study conditions on 18-hole golf course and campus grounds.

Many classes taken by students specializing in turfgrass management are held in Agronomy Building, right. Same holds true on most campuses since basic soil courses are mandatory for turf specialists.



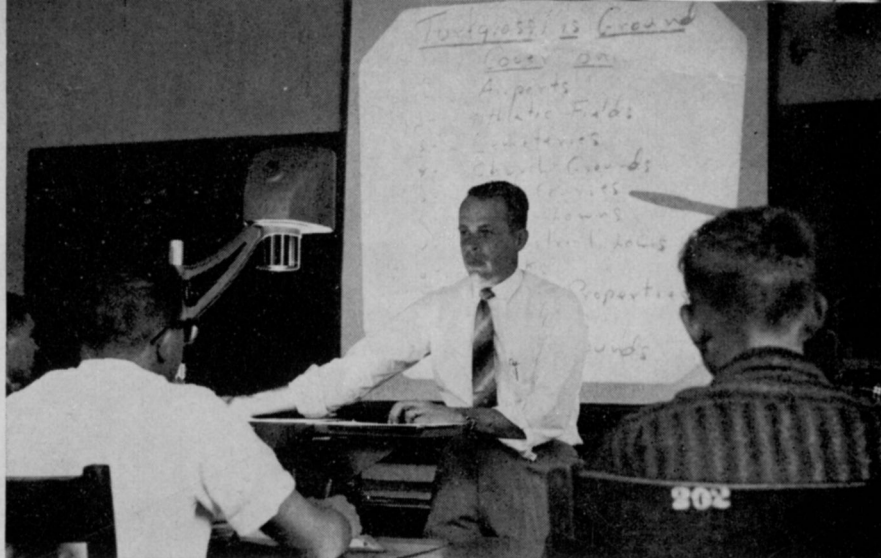
Vegetatively propagated grasses grown in greenhouse are inspected by student group below. Students also observe root development of various grasses grown in solution culture and maintained at different nutrient levels.



SKILLED supervisors and assistants for parks, cemeteries, playgrounds, industrial parks, golf courses, athletic fields, and similar areas are in demand. College training helps the young man seeking a career in turfgrass management to better serve the industry. Today, there is a shortage of professionally trained specialists.

Because of the unique need for such personnel, WEEDS TREES AND TURF magazine has completed a survey outlining training offered at the college level. Final installment of this national study is being carried in this issue of WTT.

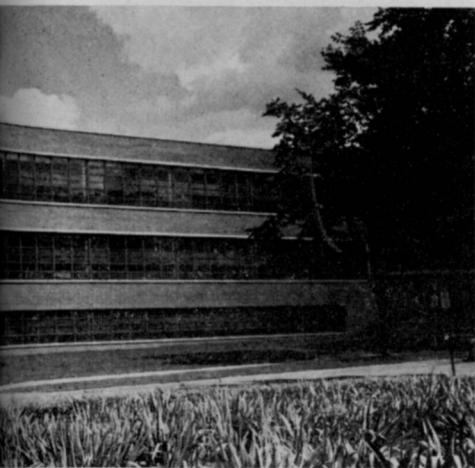
Dr. Eliot C. Roberts, professor and turfgrass management specialist at Iowa State University, offers this panorama of turf study activities at Iowa for review as typical of those at many institutions. Dr. Roberts previously taught turfgrass management at the University of Massachusetts and has kept in close touch with programs at Penn State, Rutgers and Purdue Universities.



Lecture outline is presented at start of a Turfgrass Management class period. Students study needs of turf based on use for all types of public, commercial and private grounds. Practical work is done in the field to supplement classroom exercises.

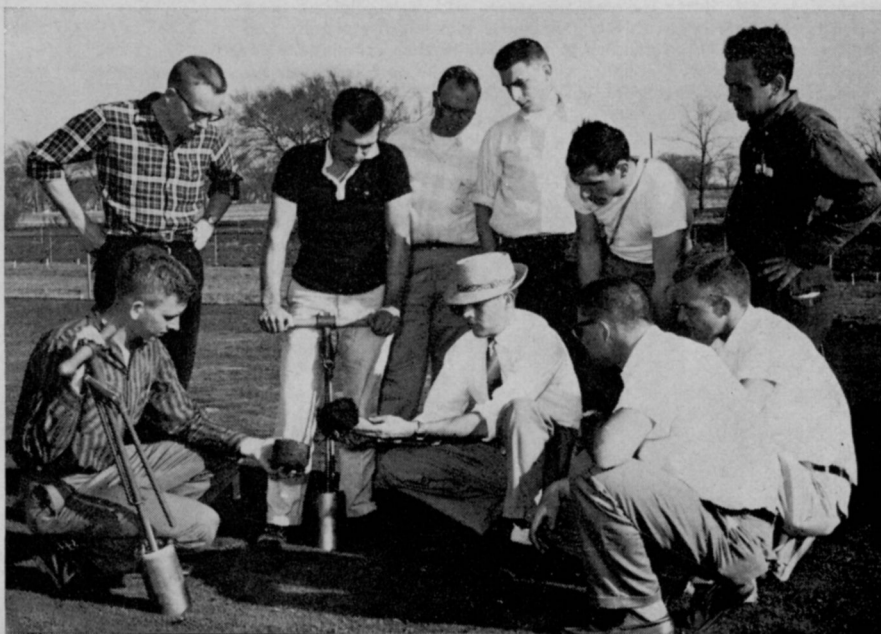


Fertilizers used on fine turf differ in physical and chemical properties. Students compare these materials prior to using them in a laboratory exercise. Different types of application equipment are also a part of training.



Turfgrass growth, left, is measured by weighing clippings taken during a laboratory exercise.

Root zone soil tells much about turfgrass growth conditions. Students, right, learn to relate foliar appearance with physical soil properties. Students also learn about grasses by evaluating amount of foliage produced under varying conditions.

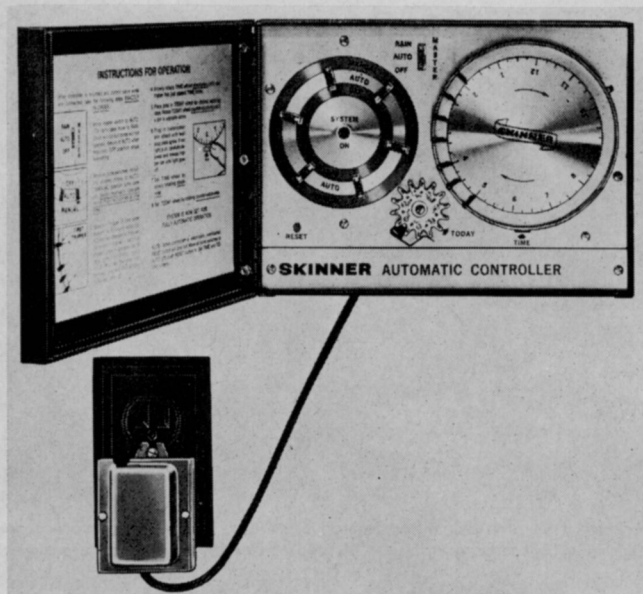


New Products . . .

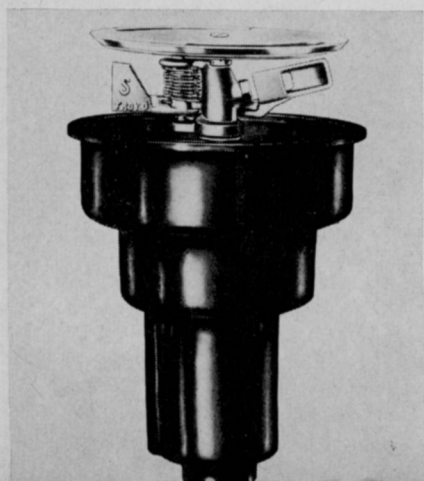
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Irrigation system, left, reduces conventional moving time by 75% while reducing crop damage. Tangential spokes, single clamp hubs, rigid couplers, and a heavy-duty power mover, are outstanding features of this improved Shur-Roll system. The quarter-mile line normally consists of 34, five or seven foot wheels, with 32 sprinklers and rigid couplers located every 40 feet. The improved tangential spoke (as in bicycle wheels) gives 60 to 100 percent greater rim support than conventional radial spokes. A 3 h.p. engine (4 h.p. optional) drives the power-mover through a transmission with forward or reverse gears. The two mover wheels are chain driven for better traction. For more information write W625, John Bean Div., Box 9490, Lansing, Mich.

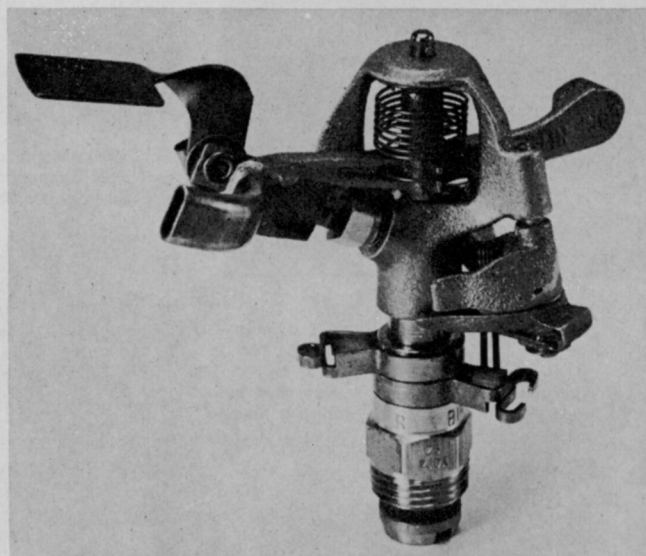
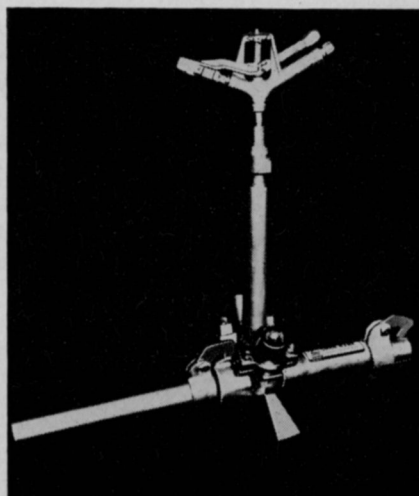


New automatic timer for both commercial and residential use (Models S-12 and S-6) is attractively styled and economically priced. Contractors will find it well adapted to residential system installations and the company reports it equally suitable for larger turf irrigation systems. Write The Skinner Irrigation Co., P.O. Box 70, Troy, Ohio 45373.



Celcon body sprinkler (Model URC-2) left, for both commercial and residential irrigation features $\frac{3}{4}$ " inlet sprinkler with brass cover plate. Unit was developed primarily to combat rising cost of cast materials. Company reports durability equal to the metal product and the price more attractive. Write Skinner, P.O. Box 70, Troy, Ohio.

John Bean's Sequa-Matic, grid-type solid set of irrigation systems now feature the V-2 Sequa-Matic valve with aluminum couplers. New capacity is 10 to 30 g.p.m. Automatic sequencing valve controls individual sprinklers by water pressure on lateral lines up to $\frac{1}{4}$ miles long. Write John Bean Div., 1305 S. Cedar, Lansing, Mich. 48910.



All models in Rain Bird's Series 25 impact sprinklers now have new friction collars that improve the ease with which sprinkler arc can be adjusted. New stainless steel collar has a pinch control and smooth glide action that allow greater accuracy in setting the watering arc of the sprinkler. The series includes sprinklers that cover full and part circle or part circle only; some models have a Precision Jet Arm to avoid back splash. Information from Rain Bird, 7045 No. Grand Ave., Glendora, Calif.

Tree Cavity Work

(from page 7)

ground, then shape of the excavation should be extended to the ground.

Large cavities, or those in or near crotches need to be braced. For this task, use screw rods or bolts. A single rod may be inserted through the cavity. When side walls are thin, crossbraces are necessary. With long cavities, rods or bolts are needed about every 24 inches from well below, through, and to well above the cavity.

When treating crotch cavities, use crossbraces through the cavity as well as above the crotch (See WTT, May, 1967, Page 21). Never install braces closer than within 2 inches of the lips of the cavity. Screw rods serve well when there is at least 3 inches of sound wood on each side. When the side wall is thin and does not contain plenty of sound wood, use bolts with counter-sunk washers and nuts. When cavity treatment is completed, fertilize the tree to speed recovery.

The so-called open method of treating large cavities is common on old, slow-growing trees and in resinous trees. During excavation, it is important to prevent drying and killing of the cambium. This can be done by keeping the cambium area at the edges of the cavity covered with shellac over-coated with plastic asphaltum.

With the open method, the cavity is pointed at the top and bottom, and the sides regularly and evenly shaped. Slope the bottom outward for drainage.

After excavation, and when the cavity is braced and the interior dried, the heartwood needs to be sterilized with creosote and given two coats of asphaltic wound dressing. Dress the entire area of all exposed surfaces. Renew the dressing as it weathers.

Favored cavity treatment for medium-sized and crotch cavities is the filled method. Though filling does not strengthen the tree, it does improve the looks of the tree and serves as a surface for the callus to heal across. The process is the same as for the open method except the inside of

the cavity needs to be larger than the mouth of the cavity to retain the filling. A small depression cut deeper into the wood, or use of wood or lath strips nailed in place, about 3 inches inside the mouth of the cavity will also help retain the filling.

Grooves Provide Cavity Drainage

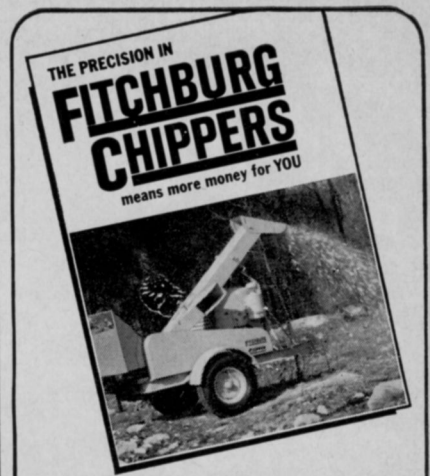
Drainage grooves need to be made on the inside face of the cavity. These are made in a form typical of the grooves in a steak platter, with the main groove ending in a depression at the bottom of the cavity. A drainpipe installed from this depression to the outside of the tree trunk just below the cavity will provide drainage. After dressing and bracing of the cavity, 3-ply asphalt felt tacked in place will keep the drainage grooves clear.

Actual filling is the final step and there are a number of suitable materials which can be used. Most common material is cement. For this type filling, use one part cement to 2 or 3 parts of clean sand (do not use ocean sand). Mix just enough water to form a stiff mortar which will hold its shape when squeezed into a lump. Such a mixture can easily be inserted into the cavity by using a trowel. Tamp thoroughly as the cavity is filled. As concrete sets, work the surface with the trowel until it is moist and smooth.

Small cavities filled with concrete can be done in a single section. But for large cavities it is best to allow for some tree movement. With these larger cavities, fill in sections and separate them with tar or asphalt paper. To permit growth of the callus, fill only to within $\frac{1}{8}$ th inch of the cambium. Once cement is hardened, waterproof the surface with tar or asphalt.

At times, tree men prefer to use a more flexible material than concrete for filling cavities. Other common materials include asphalt with dry hardwood sawdust, excelsior, or shavings added. Creosoted wood strips or blocks may be roughly fitted for

(Continued on page 25)



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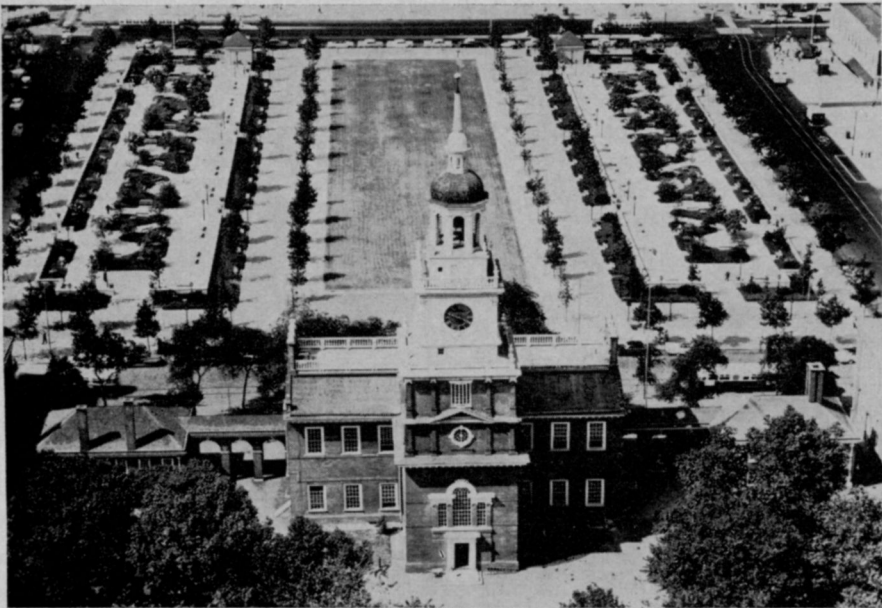
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Independence Hall with Independence Mall in the background will be toured by I.S.T.C. conventioners when they visit Philadelphia for the annual convention, Aug. 27-31.

Orville Freeman Keynotes August Meeting of ISTC

Secretary of Agriculture Orville Freeman will be keynote speaker at the 43rd annual convention of the International Shade Tree Conference, Inc., at Philadelphia, Pa., Aug. 27-31. Secretary Freeman will appear on the luncheon program on Tuesday, Aug. 29.

Convention goers are expected to fill the Marriott Motor Hotel which is one of the newest and finest in Philadelphia according to General Chairman Hyland R. Johns of Asplundh Tree Expert Company at Jenkintown, Pa. Johns and Co-chairman Ronald L. Harper of Philadelphia Electric Company have arranged for the entire staff and facilities to be made available to ISTC members. Shuttle service for sightseers and shoppers will also be available.

Expected to be of interest to many of the ISTC group will be a 35mm slide parade moderated by Dr. Spencer H. Davis, Jr., plant pathologist at Rutgers, N. J. Interested conventioners are invited to submit 6 of their own slides which are being titled "Gripes & Brags" for showing and discussion. Dr. L. C. Chadwick, executive director of ISTC from The Ohio State University, will head a panel on shade tree supplies and the quantities avail-

able in the years ahead. Assisting Dr. Chadwick will be William H. Collins, Cole Nursery Co., Circleville, O., William Flemer III, Princeton Nurseries, Princeton, N. J., and J. Frank Schmidt, Jr., Frank Schmidt & Sons, Troutdale, Ore.

Also of broad interest to the group will be a discussion of air pollution damage to trees led by Dr. Frank Wood, plant pathologist at Penn State University. Dr. Wood is also assistant director of the Environmental Research Center for Atmospheric Pollution.

Program details in addition to these highlights are available from Dr. Chadwick, 1827 Neil Ave., Columbus, O.

National Arborist Assn. To Meet August 27-31

Members of the National Arborist Assn., Inc., will stage their annual meeting at Philadelphia, Pa., August 27-31.

Executive Secretary Clarke W. Davis reports program developments are complete. The group will meet at the Marriott Motor Hotel in conjunction with the annual convention delegates of the International Shade Tree Conference.

Davis reports that the program committee is featuring both business and technical subjects. Robert G. Bristow, The Andersons Garden Center, Maumee, O., will present an employee-management subject titled, "Pleased Personnel Plus Profits Equal Success." Dr. Philip L. Rusden, Bartlett



Philip Rusden

Tree Research Laboratories, Stamford, Conn., will discuss drought and its effect on trees and how to combat dry periods. "Tree Diseases" will be the subject of Dr. Lester P. Nichols of Pennsylvania State University.



Board members of the National Arborist Association, Inc., who will head up the annual meeting at Philadelphia, Pa., beginning August 27 are, left to right: Kenneth P. Soergel, William P. Lanphear, III, Edwin E. Irish, President H. A. Morrison, and Riley Stevens.

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Insect Report

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

Turf Insects

RANGE CATERPILLAR

(*Hemileuca oliviae*)

New Mexico: No hatching on range area checked in Colfax County.

GRASS BUGS

Utah: Around Alton, Kane County, largely white in appearance; grass 3 inches high. Several hundred nymphs of *Irbisia* spp., and *Labops* spp., around each grass clump. *Labops* spp., hatched in East Fork area and other seeded range areas in Garfield County. Black species hatching in heavy numbers at higher elevations in large areas of Garfield and Kane Counties.

WINTER GRAIN MITE

(*Penthaleus major*)

California: Heavy in Susanville, Lassen County.

THRIPS

Arizona: *Chirothrips* spp., necessitated controls on bermudagrass in commercial seed fields of Yuma County. **Nevada:** *Anaphothrips obscurus* heavy on timothy in Smith Valley, Lyon County. Damage severe in some fields; will require controls.

SOD WEBWORMS

(*Crambus* spp.)

Idaho: Moths general in lawns at Bonners Ferry, Boundary County. Mating in Moscow, Latah County.

Insects of Ornamentals

APHIDS

California: *Toxoptera aurantii* medium on camellia at Fresno, Fresno County. *Macrosiphum euphorbiae*, *Acyrtosiphon solani*, and *Aphis gossypii* heavy on rhododendron nursery stock at Sacramento, Sacramento County.

BEET ARMYWORM

(*Spodoptera exigua*)

Florida: Larvae, mostly this species, heavily damaged 10 percent of 40 plants of gladiolus and severely infested 10 percent of 1 acre of carnations, at Cortez, Manatee County.

BAGWORM

(*Thyridopteryx ephemeraeformis*)

Oklahoma: Moderate to heavy, damaging juniper in several areas of Oklahoma County. **Nebraska:** Eggs hatching in Lincoln, Lancaster County.

GREEN FRUITWORM

(*Lithophane antennate*)

Maryland: Larval injury to azalea foliage conspicuous at Adelphi, Prince Georges County.

Tree Insects

APHID

Ohio: First instars through winged adults of *Eulachnus agilis* on Scotch pines in Christmas tree planting in Lake County. First instars most prevalent. **Rhode Island:** *Prociphilus imbricator* problem on beech grafts in commercial nursery in Middletown, Newport County. **Washington:** *Cinara curvipes* nymphs and apterous and alate adults heavy on ornamental spruce at Toppenish, Yakima County.

COOLEY SPRUCE GALL APHID

(*Adelges cooleyi*)

Oregon: Eggs hatched in Multnomah County on ornamental fir and spruce.

A PINE APHID

(*Schizolachnus pineti*)

California: Collected from medium infestation on *Pinus mugo* nursery stock in Santa Clara County.

FOREST TENT CATERPILLAR

(*Malacosoma disstria*)

Colorado: Eggs hatched in Fort Collins, Larimer County. **Minnesota:** Eggs hatched in heavily infested area at International Falls.

CALIFORNIA FIVE-SPINED IPS

(*Ips confusus*)

Oregon: Killed small group of native ponderosa pine near Crawfordsville in Linn County, at elevation of 300-400 feet. First report this far north and at this low elevation of State. Records to date indicate occurrence around 2,000 feet as far north as Medford area. Emerged near Jacksonville, Jackson County, from ponderosa pine.

SPRUCE NEEDLE MINER

(*Taniva albolineana*)

Minnesota: Larvae active in Minneapolis and St. Paul area and further south.

EUROPEAN PINE SHOOT MOTH

(*Rhyacionia buoliana*)

Ohio: Larvae pupating in terminals of red pine in most areas. Some heavy larval populations observed in the Mohican State Forest, Ashland County.

EUROPEAN PINE SAWFLY

(*Neodiprion sertifer*)

Ohio: Larvae damaged Scotch pines in scattered areas throughout State. **Pennsylvania:** Controls applied on Scotch pine plantation in Columbia County.

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.



J. H. Kirch

Kirch To Author Know Your Species

Beginning with the July issue J. H. Kirch will write the well-known "Know Your Species" feature for WEEDS TREES AND TURF.

Kirch, who holds bachelor of science degrees in both forestry and horticulture and a Master's degree in Forestry from Pennsylvania State University, is a native of the Keystone state. Originally, he is from Pittsburgh but now makes his home at Ambler, Pa., where he serves as Marketing Manager of Industrial Chemicals for Amchem Products, Inc. Prior to 1966, he served as Woody Plant Specialist and as Assistant Director of Research and Development for Amchem. Kirch is a member of the Weed Society of America, the Society of American Foresters, and Rotary International. He has presented numerous papers on brush control at various weed conferences, many of which have been published.

WTT is proud to present Kirch to readers, and believes his contributions in the field of vegetation control will prove helpful and interesting.

RED MAPLE

(*Acer Rubrum*)



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.

Red maple, often called scarlet maple, swamp maple or soft maple, is a medium-sized tree 50 to 70 feet high, although it occasionally reaches a height of 125 feet and a diameter of 5 feet.

Red maple ranges from Manitoba south to the Gulf of Mexico and east to New Brunswick and Florida. Generally found in swampy sites, it may also occur in drier locations, particularly in the Northeast where it grows with white pine (*Pinus strobus*) and northern hardwoods on moderately moist, sandy loam soils or rocky uplands.

In the leafless landscape of March and April, the bright red flowers of red maple are conspicuous and colorful. The characteristic maple keys, or fruits, continue the color while they are young, gradually becoming green as leaves emerge.

The leaves are 3 to 4 inches long and nearly as broad, occurring opposite one another on the twigs. They are simple, mostly 3-lobed, and coarsely toothed. The upper surface is smooth and bright green with a lighter green, finely pubescent undersurface. Bark on the branches and trunks of young trees is smooth and light gray, breaking into long, narrow scaly plates on older trees.

It is often difficult to distinguish red maple from some of the other maples growing on a cut over right-of-way. In summer, red maple may be distinguished from silver maple (*Acer saccharinum*) by the absence of a silvery white leaf undersurface and by sharp-angled sinuses between the leaf lobes. The leaf sinuses of silver maple are U-shaped. Both species may be distinguished from sugar maple (*Acer saccharum*) by their smaller, heavier-textured leaves which are less coarsely toothed. Also, the center lobe of the sugar maple leaf is somewhat square, rather than triangular.

In winter, red maple may be distinguished from silver

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.

maple by its red lustrous twigs and the absence of a pungent odor from broken twigs. Both of these species have numerous round red buds. The buds on sugar maple are conical, sharp-pointed, and brown. The twigs of sugar maple are brown, marked with pale lenticels.

In spring the fruit clusters of red and silver maple generally develop from lateral buds; those of sugar maple are from terminal buds on growth of the current year. The fruits of red and silver maple mature in early summer, but sugar maple keys do not mature until September.

All maples are readily controlled by dormant applications of brushkiller mixtures of 2,4-D and 2,4,5-T or by 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, particularly on sugar maple. Effectiveness can be improved by adding 10 to 20 gallons of oil per 100 gallons of solution, and by using the modified-basal spray technique.

Picloram as a foliage spray is very effective in controlling red maple. Ammonium sulphamate is often used where crops are present along the right-of-way.

Helicopter applications of invert emulsions of 2,4-D and 2,4,5-T have controlled red maple, but rates in excess of 6 pounds per acre of each chemical are needed for complete kill. Recently the addition of monosodium methane arsonate to the water phase of invert emulsions of 2,4-D and 2,4,5-T has increased top and root kills on red maple.

Aerial sprays of 1 1/2 to 2 pounds per acre of picloram in 15 to 20 gallons of water plus thickener have given good root kill of red maple in the Appalachian Mountain region. On moist lowland sites, lower rates have been sufficient.

Growing A Vigorous, Strong Root System On Cool Season Turfgrass

BY R. E. SCHMIDT

Assistant Professor of Agronomy, Virginia Polytechnic Institute, Blacksburg

The sod producer is very cognizant of the importance of grass root development. The stronger and more rapid a root system can be developed, the sooner a sod can be rolled and the crop harvested. Early harvesting minimizes production cost and creates a higher monetary return.

Certain environmental conditions and maintenance practices will enhance root development. Controlling environment to influence favorable growth is limited for large-scale operations. However, employing certain management functions will augment root growth. Timing is an important factor to consider in initiating some management practices. Implementation of practices must be performed to favor the root system as well as the top growth in an efficient sod production operation.

Mowing procedure, soil pH, nutrition, and moisture are some of the factors that must be programmed to enhance grass root development. It is well established that clipping height and frequency influences root growth. Juska and Hanson¹ have shown that Kentucky bluegrass root development was inhibited when the tops were mowed at 1/2 inch as compared to 2 inches. They also gave evidence that mowing bluegrass five times a week restrained bluegrass root growth in contrast to once a week mowing. There is also some indication that root pruning (deep vertical mowing) may enhance root growth.²

Moisture influence is critical on root development. This may be illustrated by an experiment run by one of our turf management students. He obtained 6-inch plugs, 1 inch thick, of Seaside bentgrass and planted them in number 10 cans filled with a sandy soil. The cans were wa-

tered to field capacity (FC) and separate cans were watered after they were permitted to dry as follows: 90% of FC, 80% of FC, 60% of FC, 30% of FC, and 10% of FC. In addition, one can was maintained at 30% FC. That is, only the top 1/3 of the can was kept moist. The data in Fig. 1 show that the infrequent heavy watering enhanced root development. Whereas, continuous light watering or frequent heavy watering inhibits root development.

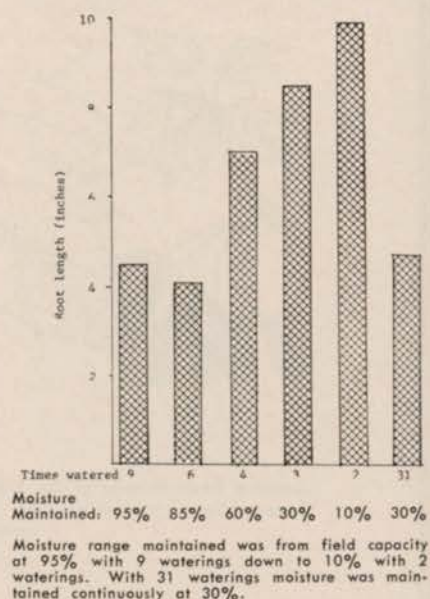
Nutrition is of utmost importance in root development. Soils near neutral acidity yield more roots than those with low pH. Liberal fertilization with phosphorous and potash enhances root development.

The fertility element that exercises the greatest influence on root development is nitrogen. Root yields will increase with increased nitrogen fertilization to a point, then further nitrogen fertilization will cause root reduction. Generally, the nitrogen rate applied to turf will inhibit root development.

When managing for maximum root production, the interaction of nitrogen nutrition and temperature must be considered. Consider the effect of temperature on cool season grasses. As temperature increases, the respiration of the plant increases. That is, increased CO₂ is given off as the temperature increases (Fig. 2). Carbon dioxide fixation also increases as temperature increases to a point (about 80 F). An increase of temperature beyond this point inhibits photosynthesis causing greater amounts of CO₂ to be given off than fixed by the grass. The reserve carbohydrates are then utilized rapidly to sustain the grass.

Top growth may continue at high temperatures until the car-

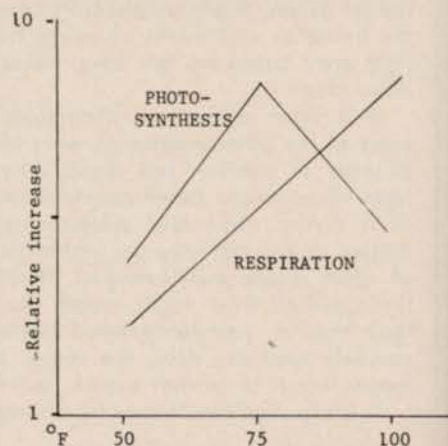
Fig. 1. Effects of Water on 31 Days of Bentgrass Root Development.



bohydrate reserve is substantially reduced (Fig. 3). However, root growth is inhibited by either high respiration or rapid top growth. Evidently, respiration and top growth have priority over root development in utilizing carbohydrates. Generally, root growth appears to be enhanced only when carbohydrates are accumulating.

Nitrogen fertilization enhances photosynthesis and normally stimulates respiration and top growth causing a net reduction of plant carbohydrate reserves. Therefore, root growth is gener-

Fig. 2. Influence of Temperature on Respiration and Photosynthesis.



ally inhibited with high nitrogen fertilization.

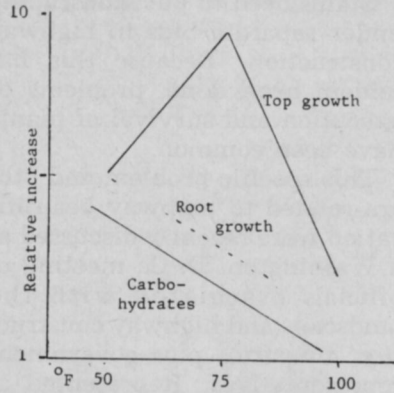
Normally the carbohydrates of cool season grasses increase during the fall and early winter. In the spring top growth is stimulated and the reserve carbohydrates are rapidly utilized. During the summer months, the carbohydrates remain relatively low.

Several workers^{3,4} have shown that some root growth of cool season grasses initiate during the fall and winter with the greatest development occurring in early spring (evidently prior to the flush spring top growth). No appreciable root growth occurs during the summer months. Seasonal root growth essentially follows the seasonal pattern of carbohydrate content.

It has been observed in some of our field experiments that liberal winter nitrogen fertilization did increase the carbohydrate content of cool season grasses during the winter. It has also been reported that winter nitrogen fertilization increases bluegrass root development.³

Further studies⁵ at V.P.I. have

Fig. 3. Influence of Temperature on Carbohydrate Reserves and Top and Root Growth.



shown that carbohydrate content and root growth were enhanced with winter nitrogen fertilization of bentgrass. This phenomenon was attributed to the increased net photosynthesis rate that occurred with liberal winter nitrogen fertilization.

From these results it seems reasonable to program for heavy N fertilization in the fall and winter and light N applications in the spring and summer for best root development of cool season grass. Liberal nitrogen

fertilization evidently is beneficial when the applications coincide with the season the plant naturally builds carbohydrate reserves and develops roots. This deviates from the idea of continuous N feeding, but true turf quality can only be obtained if management improves root development as well as top growth.

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Meeting Dates



American Association of Nurserymen, Annual Convention, Americana Hotel, Bal Harbour, Fla., July 8-13.

National Fertilizer Solutions Association, Liquid Fertilizer Round-Up, Sheraton-Jefferson Hotel, St. Louis, Mo., July 11-12.

Third National Grassland Field Day and Conference, University of Nebraska, Mead, July 12-14.

Southwestern Fertilizer Conference and Grade Hearing, Annual Meeting, Skirvin Hotel, Oklahoma City, Okla., July 19-21.

West Virginia Turfgrass Conference, West Virginia University, Morgantown, W. V., August 2-3.

USDA Turfgrass Field Day, Plant Industry Station, Beltsville, Md., Aug. 3.

Joint Convention and Trade Show of Nurserymen's Associations for Southern, Alabama, Georgia, Kentucky, North Carolina, and South Carolina, Marriott Motor Hotel, Atlanta, Ga., Aug. 6-8.

Miss Lark Trade Show and Convention, Convention Auditorium, Hot Springs, Ark., Aug. 10-12.

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

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.

Joint Meeting Deals With Highway Landscaping

States need to put landscaping under separate bids in highway construction. Because this has seldom been done, problems of execution and survival of plants have been common.

This specific problem and others related to highway beautification were recently discussed at a Washington, D. C., meeting of officials associated with the landscape and highway construction industries plus government representatives. Represented at an April 26 meeting were the American Association of State Highway Officials, American Association of Nurserymen, Associated Landscape Contractors of America, Highway Research Board, and Bureau of Public Roads. Officials agreed that landscaping bids need to be separate from construction bids and that firms chosen to do the landscape work must be qualified by prior experience and reputation.

Also, the group felt that highway departments need to project

their plant material needs three to five years in advance. Some states are already projecting two to three years in advance of need but more lead time is needed. With advance notice, growers will know the potential market.

Robert F. Lederer, president of AAN, pointed out that superior, patented strains of plant material are both desirable and either available or may be made available for highway use. However, many of these strains which are worthy because of drought, insect and disease resistance, tolerance to air pollutants and other features are not used because federal regulations relating to bids make it difficult to specify patented plant material. By eliminating red tape, Lederer believes many improved varieties could become available.

Roy Gustin, Jr., Gustin Gardens, Gaithersburg, Md., represented ALCA and discussed the problem of shock to transplanted material. He recommended that special care and attention be given plantings during the first

(Continued on page 26)



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Tree Cavity Work

(from page 17)

the cavity and set into a heavy lining of asphalt or coal tar. The surface is then faced with asphalt.

Besides these more common methods, a number of tree care companies have their own filling materials and methods. (Editor's Note: If you have a special material or method for filling cavities

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which you would like to share with other tree professionals, send it to WTT for use in a future issue).

*Recommendations for this WTT Tree Care Report are based on technical material of the Maine Forest Service. Illustrations likewise are based on Maine recommendations for preserving shade trees and supplied by Maine State Entomologist Robley W. Nash, Augusta.

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Joint Meeting

(from page 24)

two or three years to aid establishment and adjustment to the new environment. Gustin further recommended that this type care be specified as a separate item in highway landscape contracts.

More states need to hold conferences and open communications between highway officials, nurserymen, and landscape contractors. Thomas Gilmore, Jr., Gilmore Plant and Bulb Co., Julian, N. C., whose firm handles numerous highway contracts in nine states, said that those states holding such meetings have been able to resolve many of the more serious problems. Gilmore also noted that there is a need for national uniform standards and specifications.

Velsicol Has Banvel D, PMA-10 Registrations

Registration of its PMA-10 (phenylmercuric acetate) fungicide for use on golf courses has been announced by Velsicol Chemical Corp., Chicago, Ill. The chemical is approved for prevention of snow mold and for prevention and control of dollar spot, copper spot, brown patch, pink patch, helminthosporium leafspot, bluegrass blight, and Curvularia blight.

As a snow mold preventative, PMA-10 is recommended at rates of 1 to 2 ozs. per 1,000 sq. ft. in 5 gals. of water. About November is the proper time to apply the chemical, Velsicol says. For prevention and control of other specified turf diseases, recommended applications are: 1 oz. per 1,000 sq. ft. for bentgrass greens and tees, beginning in early spring and continuing at weekly intervals through the warm season; 1¼ oz. per 1,000 sq. ft. for bermuda putting greens; 1½ oz. per 1,000 sq. ft. for bermuda tees; and 1 qt. per acre, every 7 to 10 days, for routine preventive treatment of fairways during mild disease conditions.

Approval of Banvel D 4S (dicamba) for additional golf course

weeds was also recently made known by Velsicol. Suggested application is 1 to 2 pts. per acre for control of henbit, English daisy, spurge, purslane, hawkweed, lawn burweed, carpetweed, pepperweed, chicory and spurry. "Apply as a foliar spray to active-growing weeds with sufficient water to give good coverage," Velsicol recommends. "Fall germinating weeds may be controlled more effectively when treated in the fall or early winter. Make only one application per year." Write Velsicol Chemical Corp., at 341 East Ohio Street, Chicago, Ill. 60611, for more information.

Stop Japanese Beetle Damage On Turf

Turf can be protected from Japanese beetle damage, according to William F. Lyon, Extension entomologist at The Ohio State University, Columbus.

During the grub stage, which lasts some 10 months of the year, insects feed on roots of grass or other plants. Damaged turf then dies out in patches or large areas. With roots gone, dead turf can be rolled up like a carpet. When rolled back in this manner, grubs are easily spotted. They have off-white bodies and browned heads.

Once the Japanese beetle is in the adult stage, which is from about mid-June until early August, they cluster on bright sunny days on the upper parts of plants. Leaves become similar in appearance to lacework. At this time they also attack rose buds, blooms, and early ripening fruit. They are easily identified by their metallic green forepart and coppery brown wings.

Control is possible while the insect is in either the adult or grub stage. But Lyon believes best protection is by using grub controls. Aldrin, dieldrin, chlordane, and heptachlor are effective. Follow directions of the manufacturer. Apply insecticide to the surface of the turf area at any time of the year, except, of course, when the ground is frozen. Application at any time between now and August should give complete control by September, Lyon says. And, beetles should be eliminated for 10 years or more.

Trimming

Don't look back. President William M. Latta, Princeton Turf Farms, Kansas City, Mo., believes the turf industry has arrived. He says, "All phases of the turf industry are expanding at a rate undreamed of 10 years ago. More golf courses, parks and playgrounds, athletic complexes and the desire for instant lawns, coupled with more and larger turf-grass nurseries, have contributed to this growth. The irrigation industry recognizes turf irrigation as the largest single phase in dollar volume irrigation sales. If this rate of expansion in the turf industry continues, it will soon be the largest economic segment of the entire agricultural industry in the United States. Anyone who earns his livelihood in any of the many segments of this industry cannot afford to lag behind."

* * *

I.S.T.C. Conventioneers. Members of the tree industry attending their annual meeting this year should be happy with the cuisine served by Philadelphia restaurants. The Chamber of Commerce reports that Italian, German, French, Viennese, Polynesian, Chinese, Cantonese, Arabic, Indian, Pakistani, and Kosher dishes are featured. On occasion, southern fried chicken and Kansas City steaks may also be found. The Chamber also states that these dishes are superbly served in satisfying portions at reasonable prices.

* * *

Leech Turf Answers SOS. Cold weather and snow kept Warren Turf Nursery of Chicago from supplying sod for the Windy City's annual flower show this year. An SOS to Ivan Leech, Leech Turf Nursery, Denver, prevented a catastrophe and the show went on as scheduled with plenty of fresh turf. Leech says that folks of the Midwest and East Coast are mistaken in the belief that Denver is in a deep freeze for half the year. Except for a few "fast-melters," Leech says they had been basking in the sun when the call came for help.

* * *

Weeds Gulp Water. Harold Harper, Kansas soil specialist, says weeds are very extravagant in their use of water. For example, Kansas tests have shown that a 6-inch Russian thistle has already used ½ inch of moisture from the soil around it. A 6-inch Kochia plant has used 0.6 inch and a pigweed the same size about 0.9 inch of water. At the same time a 6-inch green foxtail will have used 1.4 inches of soil water.

* * *

Leased Landscapes. Expect corporations and others to turn to landscape leasing. The practice is practical and fits the financial patterns now popular with corporations. With a leased landscape, the contractor would provide landscaping materials, knowledge, and maintenance. Corporations would pay monthly over a 5-year period and use the tax advantage gained by showing an expense item rather than a capital improvement. Dr. J. H. Tinga, Virginia Polytechnic Institute, in suggesting the plan, says a 5-year lease arrangement is reasonable.

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