

WEEDS and TURF

SEPTEMBER
1964

The grass-roots magazine of vegetation maintenance and control



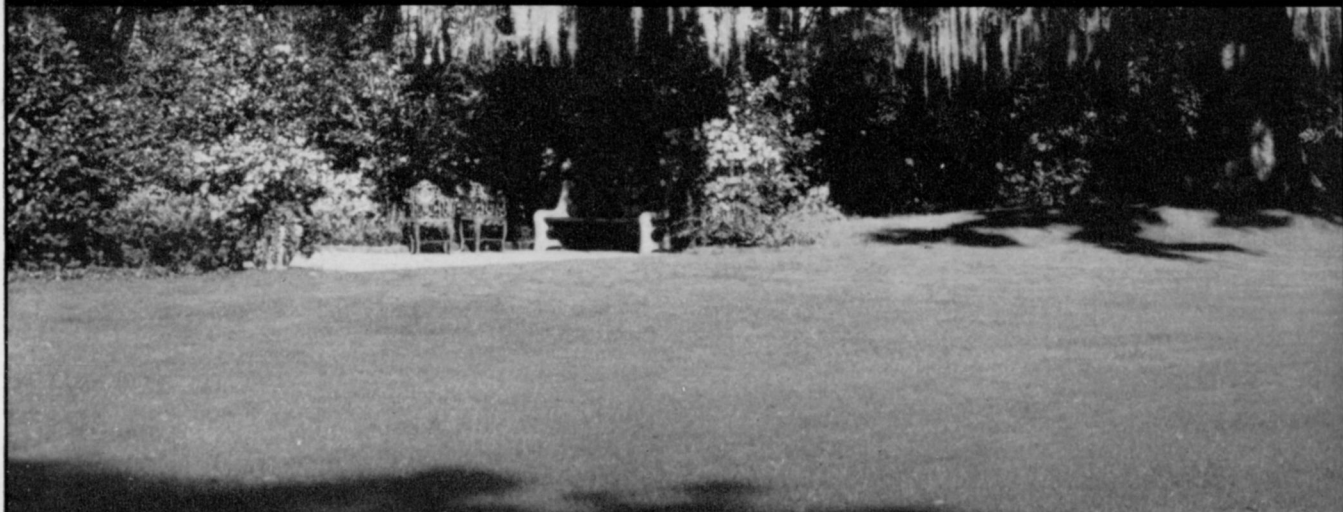
Spraying rights of way for brush control during dormant season is receiving widespread attention.

Japanese Beetles Halted
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**Brush Controllers Keep Busy
With Dormant Spraying . .10**

what to do about **TURF DISEASES AND BROADLEAF WEEDS:**



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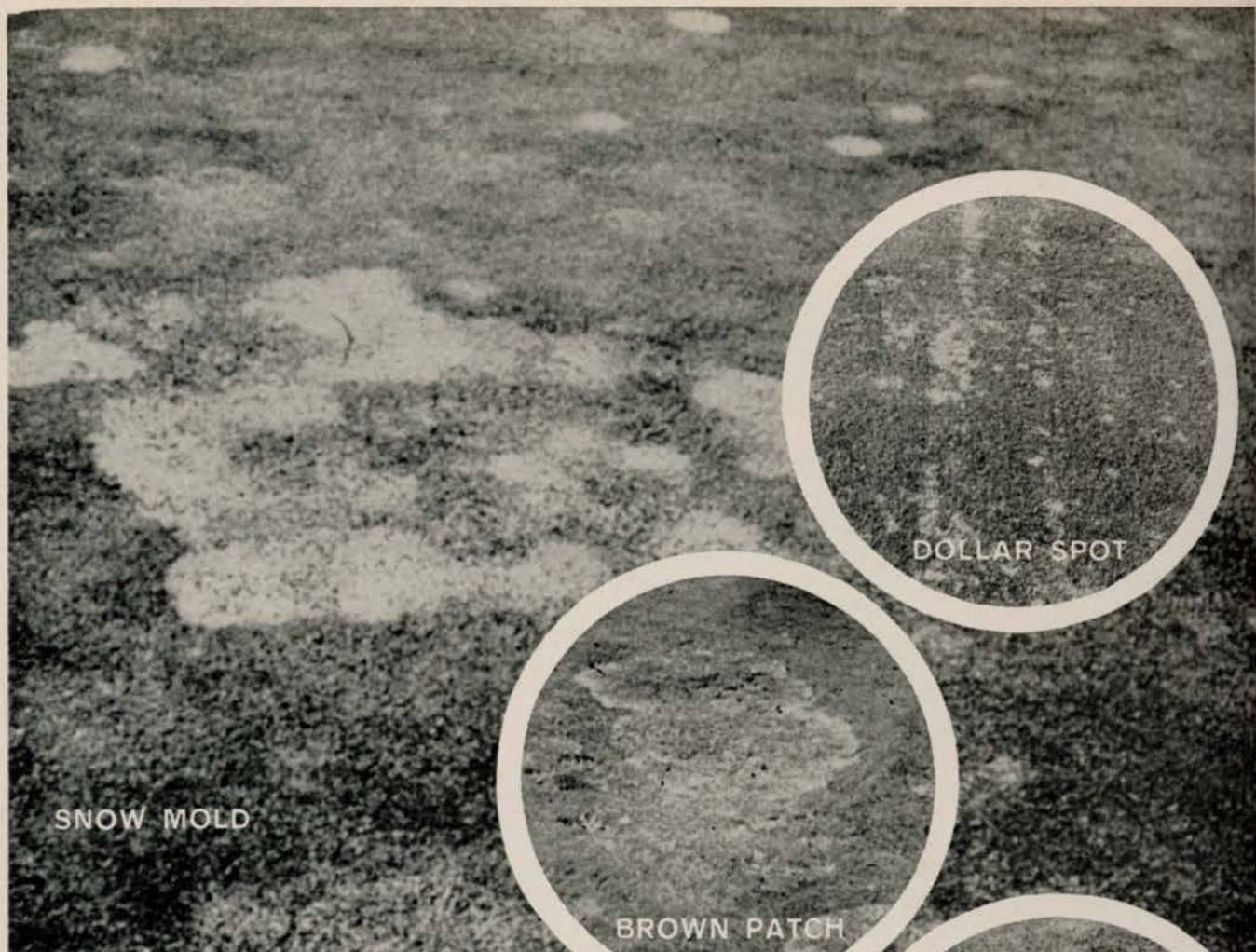
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WEEDS and TURF

September 1964

Volume 3, No. 9

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Not all tree service companies are big enough to possess every complex piece of equipment now available to help arborists do quicker, neater, cheaper jobs.

But arborists are businessmen as well as technical experts, and the principles of good business management simply must be followed. We learned recently, for example, that a tree company in a large midwestern city was seen transporting a load of newly trimmed branches right down the center lane of a major freeway during the rush hour.

This is obviously poor judgement from a public relations standpoint.

The truck, we were told, was so overloaded that it not only held up the single lane of traffic behind the truck itself, but interfered with cars attempting to pass on either side because drivers couldn't see around the obstacles of haphazardly stacked trimmings from city trees.

Of course, many excellent chippers are presently available which make it impossible for such an occurrence ever to take place; but a few companies just aren't in a position yet to buy such machines.

These small firms (and there's a definite place for them in our complex economy; most of our big firms started small themselves) must be doubly careful to exercise good public relations at all times, just as the big outfits do.

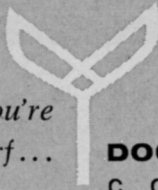
If a truckload of clippings is to be whisked away, for example, the truck should not use a busy traffic artery in the height of the rush hour. At least, the driver could take a route specially set aside for commercial vehicles. And those who load the truck in the first place should be vitally concerned that no branches or clippings overhang the truck's sides, posing an obstruction to driver vision, and physically blocking portions of the roadway.

No doubt companies which make such mistakes are few, but the action of the few, nevertheless, reflects on the many. The public judges all too rashly, and seldom stops to consider that because one tree company shows poor judgement, it is no reason to criticize the thousands who are outstanding examples of good management and public-spirited service.

Take a close look at your own practices. See anything which might be even slightly offensive? Every advance you help make for the industry will eventually become a personal advance for you!

WEEDS 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, 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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Less soluble than other triazine herbicides, Simazine is safer to use where lateral leaching in the soil might cause injury to adjacent ornamental plantings or crops. And it's relatively non-toxic to humans and animals.

Note: in Southern areas, where winter rainfall is heavy, application should be delayed until late winter or early spring.

For full details on highly effective weed control with one spray of Simazine this fall, write to:

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Interested in Suppliers Guide

We enjoy your *Weeds and Turf* publication as it is an extremely informative publication. You do an excellent job in presenting scientific information.

In a recent issue you included a Chemical Suppliers Guide. Since we supply many of the products that were listed in the guide, could you advise us on the procedure you use for selecting and including the names of suppliers?

J. A. Simmons

Research Division
O. M. Scott & Sons Co.
160 Main Street
Marysville, Ohio

Questionnaires are mailed each year to companies which supply chemicals for weed control, turf maintenance, and tree care. This year's directory, which will appear in the December issue, will also include equipment. Ed.

Parkman Likes WT

Weeds and Turf is a very excellent publication and receives cover-to-cover attention in my office every month. You and your organization are to be congratulated on the preparation and publication of such a worthwhile magazine.

James W. Smith

Field Landscape Architect
Kensington Metropolitan Park
2240 West Buno Rd.
Milford, Mich.

WSA Appreciates Coverage

I want to take this opportunity to express our deep appreciation for the fine journalistic coverage you gave the February meeting of the Weed Society of America (WSA) in your March 1964 issue of *Weeds and Turf*. The excellent coverage you gave to our meeting will enhance the image of weed science in this country and abroad.

The generous amount of space you allotted to the coverage of our meeting in your March issue is commendable. We certainly hope you will plan to cover other

major events in weed science and especially future meetings of WSA.

We also congratulate the editorial staff of *Weeds and Turf* on their decision to publish this timely periodical as a separate journal.

Dr. W. C. Shaw

Past President, WSA
Crops Research Division
Agricultural Research Service
U. S. Dept. of Agriculture
Beltsville, Md.

Needs Illustrated Weed Book

I enjoyed the April issue of *Weeds and Turf* very much. The magazine is very interesting and I find a lot of valuable information in it. I have been in the spraying business for eight years.

Would you know of a dictionary of weeds with pictures of each weed in color? This would help my men to recognize various weeds for study.

Gene Keyawa

Gene's Commercial Spraying
Chico, Calif. 95926

If any readers know of a book that would meet the requirements in the above letter, we're certain that this information would be well received by Mr. Keyawa as well as other interested applicators.—Ed.

Problem With Pond

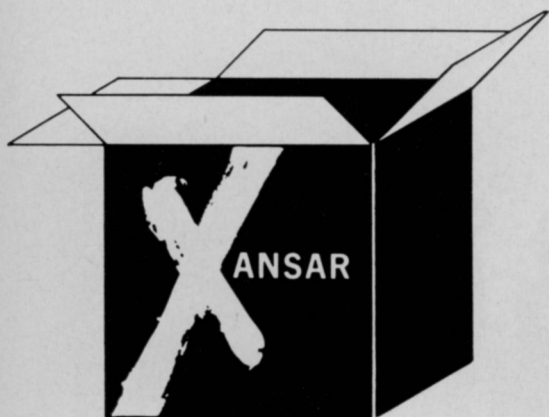
We have a 1½-acre pond with an average depth of 30 inches. Water source is from a creek, and water from the pond is used to irrigate tees, greens, and fairways. Our problem is keeping the water clean. We would appreciate any information on control of algae and underwater weeds.

William Goulet

Rochester, N. Y.

We recommend our "Applicator's Manual of Aquatic Weed Control," which will give you the information you seek to cure your pond problems.—Ed.

Weeds and Turf welcomes expressions of opinions from its readers. Send ideas and comments briefly as possible to Charles D. Webb, Editor, Weeds and Turf, 1900 Euclid Ave., Cleveland 15, Ohio.



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● A new product, "Ansar 529" (170 with a surfactant added) will simplify mixing—make the product far easier to use. ● Other "Ansar" products for control of weeds in irrigation ditches, orchards and a variety of non-crop areas will be available very soon. Today "Ansar" is the first name in herbicides . . . a product of
THE ANSUL COMPANY, MARINETTE, WIS.



THE GOAL of every rights-of-way maintenance supervisor is to create and maintain thoroughfares of maximum utility. In many instances he must concern himself with the control of unwanted brush. Mechanical clearance methods, because of their short-term effect and high cost, have given way in most areas to chemical methods of brush control. Chemical usage is under constant study in an attempt to discover new materials and new ways to use the old standards.

The phenoxy acid herbicides,

such as 2,4-D and 2,4,5-T, have been the cornerstone for most brush control programs for nearly 15 years. Their overall effectiveness, economy, and human and animal safety characteristics are such that they will probably be the standards for comparison for a long time to come. Their use, until recent years, was primarily as stem-foliage treatments with smaller varying amounts being applied as basal, stump, notch, and injection applications. It can be readily recognized that only the first-mentioned method lends it-

self to extensive large-scale broadcast applications.

However, the stem-foliage growing season applications contain certain inherent problems which limit their complete acceptance. In crop-growing areas, damage to sensitive crop plants by physical drift and/or volatility can sometimes create many complaints and much ill will. In urban and suburban areas, "brown-out" (the leaf browning which occurs 2-3 weeks following growing season applications of the phenoxy acid herbicides) again creates public dissatisfac-



tion with such spray programs. The stem-foliage method of herbicide application also involves the use of large amounts of spray solution and high pressures to force the spray through the leaf canopy.

This naturally tends to increase the intensity and extent of the first two problems mentioned. The stem-foliage spray program is limited only to certain portions of the growing season. Therefore, there are a relatively smaller number of working days available to the applicator. Because of the depth of foliage,

oftentimes inadequate chemical coverage is obtained and this leads to incomplete kill, and increased resprouting. Chemical "pruning" is less costly than mechanical cutting, but is still not a satisfactory end. It is the applicator's desire and need continually to reduce the total number of woody stems per acre.

The above problems associated with stem-foliage spraying have been known and discussed for years. The fact that basal treatments could be used at any time led some investigators to propose the use of an extensive overall

spray to be applied to woody stems during the dormant season (between leaf drop in the fall, and bud growth initiation in the spring). The question to be answered was whether a hormonal herbicide such as 2,4,5-T could be absorbed adequately, remain unbroken, in toxic concentrations in the stem tissue during the dormant period of the plant's life cycle, and still effect its physiological action the following growing season.

Research investigations and commercial applications over
(Continued on page 26)

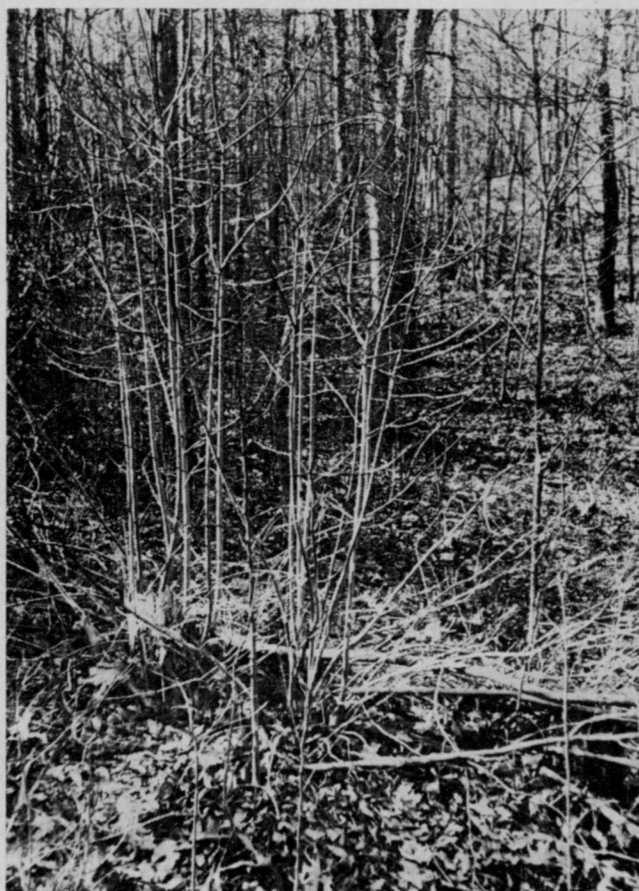
Dormant Season Brush Control

By DR. B. A. SPRAYBERRY

Technical Service, Agricultural Chemicals, Diamond Alkali Company, Cleveland, Ohio

Spraying brush after leaves have dropped can be an off-season moneymaker for many CAs.

Dormant season spraying has been tested, and is used, by railways (left). While it need not be the dead of winter to use "dormant cane broadcast," it is possible to apply chemicals when snow is on the ground (below). Actually, the brush at right is "dormant enough" to permit use of the process described in this article.



JAPANESE beetles are notorious hitchhikers, but they had better not stick out their thumbs around the Cleveland-Hopkins Metropolitan Airport in Cleveland, Ohio, because last summer officials treated the field's 800 acres to effectively control these voracious pests that chomp on more than 275 different shrubs, trees, and plants.

Although Japanese beetles do not necessarily present a major problem to the airport grounds, their presence there poses a threat to agriculture west of the Mississippi River, where only a few have been found in isolated locations.

"Once they infiltrate an airport such as this, they can hop a jetliner and spread to California in a matter of hours," said Charles N. Sheppard, supervisor of the U.S. Department of Agriculture Plant Pest Control Division for Ohio and Kentucky. Steve Webster, USDA inspector for several counties in the Cleveland area, was directly responsible for the Cleveland project.

The airport, located about 10 miles southwest of Cleveland, was previously treated with DDT emulsion foliage spray to control adult beetle infestations. "We started using Sevin insecticide as a foliage spray in 1962 on recommendation of our Washington office. Some of the vital considerations for changing were its quick kill of Japanese beetles, its longer residual ac-

tion, and its relative safety to humans and wildlife," said Mr. Sheppard.

Cooperating with the U. S. Department of Agriculture, the state and city authorities are vitally concerned with keeping airports free of Japanese beetles. And the airlines have also entered the picture.

Three years ago, the Cleveland-Hopkins field was badly infested. Beetles even buzzed cus-

tomers in the terminal restaurants and stores. At that time, a residual soil insecticide program was initiated to control Japanese beetle grubs and a foliage spray was used to kill adult beetles which migrate from outlying areas.

To assist the program, the USDA furnished the equipment and trained the airline personnel in insecticide use. Airplane crews sprayed plane interiors

Controlling **JAPANESE**



BETLES at Cleveland's Airport

prior to take-off to prevent beetles from getting a free ride to uninfested areas.

Japanese beetles were first discovered in this country in 1916 near Riverton, New Jersey. They have multiplied and spread until they now are found in varying numbers from southern Maine southward to Georgia and westward to Illinois.

Last year, officials also treated the Akron-Canton Airport, south

of Cleveland, and other strategic locations in the Cleveland area with Sevin. "Japanese beetles are abundant in about 30 counties in eastern Ohio," said Mr. Sheppard.

Rain Launched Beetle Attack

A dry summer in northern Ohio helped to keep Japanese beetle populations down last year, according to Mr. Sheppard. "This type of weather kills many

of the newly hatched grubs and destroys many eggs," he said. But, he said, the rain during July triggered a beetle emergence from the ground, "and we went to work with our trucks."

"In the outlying airport areas, where the vegetation is dense, the adult beetle population was heavy," Mr. Webster said. He noted that beetles were especially prevalent on willow and wild grape leaves. These seem to be the beetle's favorite host plants in the airport area, which is almost devoid of its many other favored ornamental hosts.

Each hour, two men operating a pickup truck equipped with a mistblower, were able to treat 50 acres with insecticide.

Spreader-Sticker Added

"We used 15 lbs. of insecticide to 100 gallons of water," Mr. Sheppard said, "and included a spreader-sticker substance to insure an insecticide deposit for several days on the plants and large black-top areas at the airport."

Since Sevin (carbaryl) insecticide is said to be safer to humans and animals than some other in-

Several large pieces of equipment, including the Buffalo Turbine hopper-fed machine in the background, were used in the Cleveland airport project. Equipment was periodically checked by this team of USDA scientists.





Even the fringe areas of the giant airport were treated when USDA experts stopped the Japanese beetle infestation from spreading. Truck above was used to circle the airport grounds, as well as to lay down a protective mist on the runways themselves (below).



secticides, drift of the material does not present a hazard to property adjoining the airport. The spray crew reported the pesticide was well suited for mistblower application. They were not able to cover rugged terrain hardly navigable by jeep, but they fogged such areas with a thick cloud of mist.

"Sevin is easy to apply," Mr. Sheppard said, "and this is another reason for using it. Our men do not need to wear masks or special clothing while spraying. They just practice normal safety precautions.

"Sevin usually lasts about seven to ten days, or until it is dissipated by rain. It gives a quick kill to the adult beetles which emerge from under the soil, mostly during July and August in the Cleveland area."

After a four- to six week period above the ground, the beetles gradually disappear. Most of them are gone by the middle of August, but in New England some are around until frost.

"Most people forget about them when they are gone," Mr. Sheppard said, "but the damage has been done. They leave the plants on which they have been feeding and burrow into the ground, usually in turf. Then, they lay eggs which later develop into grubs.

"For some strange reason," he added, "Japanese beetles are attracted to airplanes. However, after we complete our spray program, more than 80% of the beetles at the Cleveland-Hopkins Airport will be destroyed, and we expect 100% control for a period of 10 years thereafter.

"Airlines didn't have to spray their planes last year because our continuing program took care of all the beetles in the immediate area. Our work last year indicated that, with the soil insecticide program to kill the overwintering grubs and the application of Sevin insecticide in the summer, we can keep the airport relatively free of beetles."

Beneficial Worms Can Become Lawn Nuisance

Although earthworms and night crawlers are usually regarded as beneficial, they can become so abundant in lawns that control measures are necessary, explains Bill Hantsbarger, Colorado State University extension entomologist.

Worm overpopulation in lawns can result in an uneven turf due to earthworm castings. Lawns damaged in this way are difficult to walk upon and more difficult to mow, the entomologist continues.

Earthworm control is limited, but numbers can be reduced by applying chlordane to the soil. One pint of 46% liquid chlordane should be mixed with 20 gallons of water. Ten gallons of this mixture will cover about 1,000 square feet of lawn area, Hantsbarger explains.

This earthworm control mixture can be applied with a conventional sprayer. After the insecticide has been applied, the lawn should be thoroughly watered. This will carry the insecticide down into the soil where the worms are working. When the lawn has dried, the turf will be safe for children and pets. One application of the insecticide should last an entire season.

Best results are obtained when soil temperature is warm and earthworms are working close to the surface. Late spring or summer applications are usually

Colorado Weed Book Published

A 218-page book, titled "Weeds of Colorado," has been published by Colorado State University Agricultural Experiment Station. The book is the work of Bruce J. Thornton, associate botanist, and Dr. H. D. Harrington, botanist.

Including nearly 150 drawings of weeds, the book also has an appendix containing summaries of Colorado pure seed law, pest law, and weed law. Copies of the book are available for \$1, postpaid, from the Bulletin Room, Colorado State University, Fort Collins, Colo. 80521, Request Bulletin 514-S.

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Turfgrass Portraits III:

Bentgrasses

●

By DR. ROBERT W. SCHERY

Director, The Lawn Institute
Marysville, Ohio

●

This is the third in a series of nine articles on basic traits and maintenance procedures for common turfgrasses. Next month author Schery discusses "Wintergrass".

BENTGRASSES have long been the elite northern turf species, except for one "black sheep" of the family, redtop, a frequent nursegrass. Distinctions between bentgrasses are not clear cut, and varieties reflect local adaptation as much as anything. An outstanding example is Highland bentgrass, which has made a hilly section of the Cascade foothills in Oregon its own. The just-average rainfall of this area, with hot, dry summers, is hardly typical "bentgrass country." In contrast Astoria and Seaside varieties come mostly from lower lying bottoms nearer the coast, where rainfall may be double that of the Highland area.

Both Highland and Astoria are grouped as Colonial bents (*Agrostis tenuis*), along with "Colonial bent" from Washington. Holfior, a Dutch selection, seems similar, though classified *Agrostis stolonifera*. Seaside, and more recently the hybrid, Penncross, are considered creeping bentgrasses, *Agrostis palustris*. The exquisitely fine-textured Velvet bent (*Agrostis canina*) is experiencing some re-

vival of interest. All are available as seed. Seed of any sexual species carries a degree of genetic reassortment. A seeded population includes very slightly varying types, and profits from hybrid vigor. There is also the substantial convenience of easy planting.

Many golf greens have been planted to bent strains perpetuated vegetatively and thus held reasonably uniform (assuming no mutations or volunteer grass in the nursery). Such strains have been mostly local adaptations, noticed doing well under usage. They are primarily for specialized golf turf, under a regimen of care too tedious and expensive for homeowner, industrial, or general public usage.

Only the most fragmentary records exist of early bentgrass introductions, and what intermixture has occurred with native species. Mixed lots of "German bent" were early brought to Oregon, and spread widely west of the Cascades. Natural selection supplied successful types, which the agriculturists later chose for varietal designation. Today Oregon supplies most of the domestic fine-textured bentgrass seed, a large portion of which is exported back to Europe (from which it presumably originated). The exception is coarse redtop (*Agrostis alba*), of which most seed has a midwestern origin.

Growth Pattern and Preferences

With breeds of bentgrass so diverse, it's hardly possible to characterize growth pattern exactly. All bentgrasses are "cool-weather" species, growing exuberantly in spring and autumn (temperatures ranging downward from 80°). They don't hold their color into winter quite so well as do Kentucky bluegrasses and fine fescues, but nonetheless retain a greenish cast, especially where protected by a snow blanket.

To a greater or lesser extent, bentgrasses spread by above-ground runners (stolons) that root at the joints. This is especially the tendency with creeping bents. Tillers are abun-

dant, contributing to the superbly tight texture that makes bentgrasses so sought for bowling and putting greens. But this dense growth weaves a thatch of intercrossing stems, demanding precautionary thinning (dethatching) occasionally. Bentgrasses are thus not so self-sufficient and easy to keep as are most Kentucky bluegrasses and fine fescues. Some varieties are handled more easily than others. The creeping bentgrasses require most care. More erect forms, such as Highland, mat less, usually prove more suitable for lawns and fairways.

Any bentgrass deserves mowing at least twice per week, to encourage tillering from below. Otherwise a tuft of leaves forms at the tip of the stem, leaving brown stubble when removed by mowing.

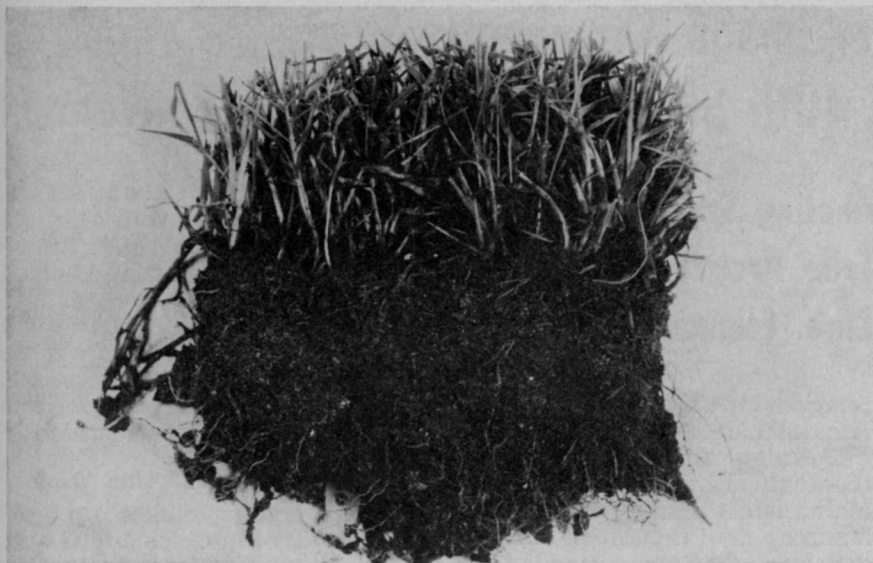
By and large, bentgrasses love the "full rich life." They do their best in misty climates, or where they are watered regularly. They relish fertilization, possibly partly because a rainy environment leaches plant food. Another consequence of abundant moisture is acid soil, of which bentgrass is quite tolerant.

Adaptation

Bentgrass is preeminent on the Pacific coast from San Francisco northward. It does reasonably well in the northern states east of the Great Plains, too, especially around the Great Lakes, and in some of the drizzlier sections of New England.

Most bentgrass varieties are widely adapted, with seeded types such as Highland and Penncross being utilized both East and West, North and (mid) South. The vegetative varieties often perform slightly better according to region. Washington, Arlington, and Congressional have rated near the top in Washington, D. C.; Old Orchard, Toronto, Cohansey and others in the upper Midwest; Evansville and Springfield in the lower Midwest. All bentgrasses perform better in full or nearly full sun, as compared to shade.

In the early days of packaged lawn seed, bentgrass of uncer-



Highland bentgrass, shown here, is one of the more erect of the bentgrasses. This sod is mowed to about a $\frac{3}{4}$ -inch height. Photograph is from The Lawn Institute, which author Schery heads.

tain origin was often included. Some natural selections have found the Great Lakes area so to their liking that volunteer bentgrass has become a pest. Tight patches show up in Cleveland and Detroit lawns planted to bluegrass. Seed or live stems seem to occur in most soils.

Many named varieties of bentgrass are probably not the pest that is this volunteer sort. Lawn Institute trials so far indicate that Highland is not aggressive, does not invade neighboring bluegrass. If anything, it is too meek, letting bluegrass and clover invade it. Winterseeding tests in the South show it to be very mild mannered there. The pendulum may someday swing back to include bentgrass in certain seed mixtures (for turfs that must be mowed low).

Adaptation to low mowing is the main reason for choosing bentgrass. Its special usefulness for golf and bowling greens, usually clipped $\frac{1}{4}$ inch or lower, is obvious. But many fairways, and some lawns, are being low-clipped. Only under very favorable circumstances will bluegrass and fine fescue stand the $\frac{1}{2}$ -inch clipping height demanded for professional golf tournaments these days.

Propagation

Bentgrass seeds are very small and abundant, about 7 million to the pound. Consequently, seed-

ing rates can be quite light, though limited on the low side by inability to spread small quantities of seed evenly. One pound per M suffices with a good seedbed. The seedbed should have been cultivated, generously fertilized, allowed to settle, leveled, and the surface loosened. A good spreader distributes the seed more evenly than is possible by hand; for hand sowing the seed can be bulked with vermiculite, soil, cornmeal, or any dry materials to allow more leeway in distribution.

With the vegetative varieties, the usual practice is to order fresh stolons (fragmented stems from sod washed free of soil). The stolons are spread several bushels/M, topdressed lightly with soil, and watered regularly until rooted from the joints.

What To Watch Out For

Aside from thatch, one of the biggest headaches with bentgrass is disease. Brown patch and dollar spot are especially troublesome, the former under high fertility, the latter under low. Regular prophylaxis with fungicides should be part of the maintenance program, at least in muggy weather. Be careful of burn with certain mercurials and unproven formulations. Even in winter, snow mold (three or four different fungi) can blemish bentgrass. Preventive fungicidal

treatment before snow falls, and during any open period of winter, helps forestall snow mold.

Insect damage is no worse to bent than to other grasses. If attack threatens, insecticides used as recommended should not harm or discolor bentgrass. But luxuriant bentgrass may be sensitive to fertilizer, or to certain herbicides (viz. Zytron, Silvex, certain arsenicals), especially on hot summer days. One would hesitate to apply a soluble fertilizer any stronger than 1 lb.N/M, and it is a good precaution to syringe even this light a rate into the turf during hot weather. There is a tendency with bentgrasses for fertilizer particles to perch atop the tight sod rather than sift through to the soil as would be the case with bluegrass and fescue.

Intensively managed bent, such as on golf greens, may winterkill occasionally. Seldom is this directly due to cold, but more likely a cumulative effect involving desiccation and perhaps subsequent disease. Where snow lies on the ground most of the winter, drying out is generally not serious, though snow mold may be intensified. Watson, of Toro, has been successful in protecting putting greens during winter with plastic covers.

In Summary

Bentgrasses offer the finest textured luxury turf available to more northerly regions. Such high status is not without its drawbacks, however, since bentgrasses must be well tended to live up to their potentialities. Involved are frequent mowing, high fertility, irrigation, and regular pesticide application. Disease prevention is particularly important. And vigorous varieties with creeping tendencies may thatch, which in turn can intensify mowing, thinning, and disease-prevention requirements. In spite of the more onerous maintenance, some of the less troublesome varieties merit further trial for low-cut turfs eastward of the Great Plains. Highland should not be the aggressive problem there that is volunteer bent.

Arborists: Build a Better Image, Unanimous Advice Of Speakers At 40th Shade Tree Conference Convention

450 Delegates at Houston Meeting Seek Expanded Municipal Tree Program, Set To Work on Line Clearance's Future

Since members of the American business community in general put an almost overwhelming emphasis on "public relations" these days, it's no surprise that delegates to the 40th Annual International Shade Tree Conference Convention should do so too.

In fact, a theme reiterated constantly throughout the 6-day affair was the importance of telling the public about the tree business.

But the 450 commercial arborists, municipal foresters, shade tree commissioners, park superintendents, and utility foresters who convened on the Shamrock Hilton Hotel in Houston, Texas, August 16-21, remembered to relate the vagaries of "public relations" to the more tangible values of sound technical know-how and boundless enthusiasm for the job at hand.

After all, the group decided, public relations, in a larger sense, relies on know-how for its substance, and on dedication for its fiber. Thus the varied program of this 40th Convention seemed specifically designed to give a broad base for developing the "better image" so many speakers cried out for.

Underlying themes which characterized the annual meeting (in addition to the public relations function) were (1) the interrelationship of other vegetation maintenance activities to tree work, and (2) the broader

relationship of arboriculture to American industry as a whole.

Defining the first of these themes were talks on tree-lawn maintenance and on general landscaping. Pinpointing the second was a call for extended cooperation between the ISTC and such groups as the Edison Institute to help bring about a general uplifting of arboricultural standards and improvement in the actual appearance of our city streets, where trees and utility lines wage their cold war of co-existence.

But the fact that the recurring concern of delegates and speakers alike was to be the projection of a better image became apparent early in the week when widely known industry figure Keith L. Davey mounted the podium to discuss "Good Standards of Line Clearing."

Davey, president of Davey Tree Surgery Co., Ltd., in San Francisco, Calif., made his remarks during the Tuesday morning sessions on public utility arboriculture. This portion of the program was arranged by C. E. Lee, Southern California Edison Co., Los Angeles; Lee is chairman of the ISTC Public Utility Arborists Committee.

"Line clearing, as a recognized regular part of a utility's planned operations, has only developed since the midtwenties," Davey began.

Previously, he said, linemen removed interfering trees the

quickest and easiest way known, which usually meant a ruined tree. "By the thirties," the pioneer arborist continued, "bad public relations as well as high costs brought contracting by recognized tree companies to the front. As could be expected, with this quick expansion, both good and poor work resulted."

Makeup of "Good" Line Work

What really makes up good standards of line clearing? Davey asked. "Basically, by its very public nature," he answered, "whatever is done must leave each tree structurally stronger and the neighborhood better looking than before." Then he reminded his audience that there is no shortcut to drop crotching and pruning to a lateral, or in shaping the tree in line clearance.

So 40 years of line clearing, good and bad, has resulted in many inferior specimens of trees still standing on our streets as a result of poor work. Unfortunately, the Californian elaborated, line clearing has also been charged with all the other misplaced trees under or near the lines.

"This is not right or fair," Davey proclaimed, "but it does give us our brightest aspect for a good future utility image. A plan to remove and replace weed trees in utility tree-trimming will bestow real value to the community."

"I believe a carefully planned removal-replacement program using many clonal varieties, such as those developed by the Saratoga Horticultural Foundation, is our best final standard for line clearing. As the need for utility pruning decreases [because of planned planting and underground lines—Ed.] what a wonderful heritage we can leave for our children," Davey concluded.

Davey's address fell on ears already attuned to the public relations aspect of this plea for more responsible management of utility line planting. The previous speaker, a Texas utility executive, left no holds barred in his emphasis on what an image can mean both to utilities and to the companies which contract to



New ISTC president Joseph Dietrich (left) of Greenwich, Conn., was congratulated by longtime ISTC leader and Cleveland municipal arborist John Michalko.



Davey: "A wonderful heritage of trees for our children."

clear their lines and rights-of-way. W. B. Thornton, Right of Way Agent, Houston Lighting and Power Co., said from the outset that he knew no group which is "in greater need of a good public image than are members of the rights-of-way profession."

"You gentlemen whose companies are doing work for the utilities have a public image to protect and improve—not only for the utility company itself, but for your own firms as well."

Thornton said every man and woman working for an investor-owned utility company today, whether directly or indirectly, must assume full responsibility for "selling" the company to all with whom they come in contact. This must be done, he added, "if the investor-owned utility companies are to continue on their own merit and strength, without government domination and control."

"Whether you contract for work with the Detroit Edison, Mountain Valley Electric Co., or my own company, Houston Lighting & Power, you are an integral part of the formation of the public image of those companies, right down to the man burning brush," the Houstonian commented.

One way to get a better "PR" performance from employees is to ask utilities to send one of their public relations executives to address line clearance crews and office staff.

"Ten years ago, Houston Lighting & Power Co. had 373,995 customers in its service area. The Trees of Houston Company doing our transmission and distribution line clearing, contacted 12,961 of these customers for permission to trim and remove

trees. In 1963, Houston Lighting & Power Co. had 521,230 customers. Our contractors contacted 24,982 residents or customers. Thus the foreman for Trees of Houston probably came into actual personal contact with more customers of Houston Lighting & Power Co. than all of the employees of the company itself combined." The public relations aspect of this point is obvious, Thornton implied.

In conclusion, Thornton said, "Every man working in our employ should be an ambassador of good will to everyone with whom he comes in contact, whether by idea, by thought, or by action. This is the fundamental way, and the only way, to acquire, keep, and project a good public image."

More ISTC City Tree Say-So?

A proposal that the International Shade Tree Conference extend further its program in municipal arboriculture was an-



Thornton: "Every arborist an ambassador of good will."

nounced by Edgar G. Rex, Executive Secretary, New Jersey Federation of Shade Tree Commissioners, New Brunswick. Rex was also part of the Tuesday morning program.

While many of our large cities have organized street tree plans, Rex began, all too many need help in these plans. Rex, in his relationship of arboriculture to community industry, recommended that municipalities without full-time arborists hire a trained consultant who can direct tree planning activities.

"Impulsiveness in tree plans must be discouraged," Rex added. "We need to assemble a truly integral representation of major utilities to discuss prob-

lems of mutual concern, with the promulgation of street trees as the ultimate goal."

Rex suggested that the ISTC might work in this regard with the Edison Institute, a trade group headquartered in New York whose members are the investor-owned electric utilities.

City's Look/Muny Arborists Team

"If we are to preserve any of the beauty of our cities, the municipal arborist must lead the way." This was the opinion of James T. Oates, longtime city tree authority and now City Arborist for Richmond, Va., who spoke during the sessions on municipal arboriculture. These municipal meetings, which take place concurrently with the National Arborist Association Meeting, are under the direction of John G. Michalko, Shade Tree Commissioner for the City of Cleveland, Ohio, and chairman of ISTC's Municipal Arborist Committee.

"I recently took a 2,000-mile tour through many cities," Oates said. "Many of you here are representatives of utilities, and many of you, as line clearing people, probably belong to the International Shade Tree Conference. If so, and you condoned the work I saw, we then have a tremendous job as municipal arborists—that of selling you on the idea that there is an era of *community* responsibility facing us."

Oakes wants standards of performance set up within the ISTC and within the Municipal Arborists group specifically. He also imposed larger responsibilities on arborists when, while discussing a series of slides, he asked, "Are you prepared to put the proper plants as a whole in a park? Lay out a rose garden? Landscape a median strip?"



Rex: "Impulsiveness in tree plans must be discouraged."

These are all duties which increasingly fall under the responsibility of the municipal arborist, Oakes suggested.

Remaking St. Louis' Tree Dept.

How he brought a poorly organized municipal forestry department to a highly complex and effective level was explained by Edward J. Schrader, Commissioner of Forestry for the City of St. Louis, Mo. Schrader said he was shocked, when he first assumed his municipal duties in St. Louis, to learn that arboricultural standards were not considered in the Forestry Division's operations. There was no in-service training program, and only a few employees were trained at all in municipal forestry techniques.

Trimming schedules were unheard of, equipment obsolete.

With these problems facing him, Schrader set out to remake the entire tree maintenance program for the city.

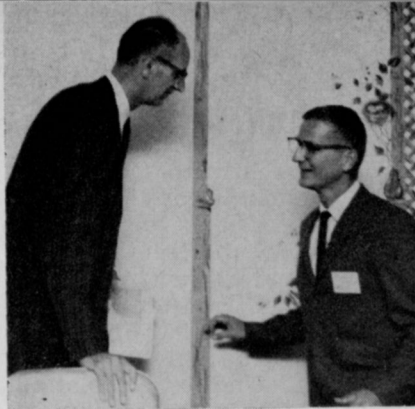
First step, he said, was to obtain the necessary tools for his men. Then he set up a training program, which he implemented by adding a standard operating procedure manual.

"Now," Schrader said, "we were beginning to shape up."

Schrader cut his crews from six or seven men to four men each in order to cover more city area and to increase efficiency. He established work quotas to govern how many trees each crew could remove or trim in a day.

"From this inadequate forestry section in 1954," Schrader said proudly, "We have made considerable progress."

Where before there were 35 men in the section, now there are 62 regular tree workers and 10 additional ones just on weed control (the latter function is considered an allied job and is administered by the Forestry Division in St. Louis). Schrader's operating budget is \$299,000 with an additional \$60,000 for contractual trimming.



Hurried conference before an address on equipment enabled ISTC outgoing prexy Dr. Spencer Davis to match notes with Fred C. Galle, (right) Director of Horticulture, Callaway Gardens, Pine Mountain, Ga.

Schrader says he now has the following equipment: 23 trucks; 2 tractors; 2 Sky Masters; 7 chippers; 3 mistblowers; 3 hydraulic stump cutters; 1 tree mover; 6 weed mowers; 1 hydraulic planting auger; 3 weed sprayers; 28 chain saws; and a well-stocked warehouse of small tools.

Returning to the dominant theme of the convention, Schrader said the city forester must be a good salesman if the forestry division is to become a prominent city department. "You must conduct a good continuous public relations program, educating both the citizens and the city fathers in the value of shade trees and the necessity for their proper care."

As part of his program, the city has had an active campaign to urge citizens to plant trees, and there seems to be an upswing in general interest in tree care in St. Louis, he concluded.

How In-Service Training Works

Schrader had lamented the lack in St. Louis of an in-service training program when he went there to reshape the arboreal face of the city. The following speaker gave a dynamic illustration of how such a program is established.

Outlining a training program for municipal arborists was Frank Vaydik, Superintendent of Parks for Kansas City, Mo., and formerly with Detroit's park and tree agency. He used a bank of three projectors to spread a

30-foot wall of color slides before the audience as he spoke. The presentation was most enthusiastically received.

"The greatest resource any organization has is its people," Vaydik began. Therefore it is obvious that training is of primary importance in efficient operation.

Vaydik feels that too much of today's training material is directed at supervisors, while "underlings" actually need the training most. "Only through training can personnel in the lower echelons develop to their fullest capacity," he summarized.

Vaydik's plan is divided into four phases: (1) *initiation* of program; (2) *selecting type* of program; (3) *obtaining time* to conduct it; and (4) *designing* the actual program itself.

The person to initiate the training schedule, in municipal arboriculture, is the Commissioner of Shade Trees or City Forester, Vaydik said. Then he must remain concerned with the training plan throughout its duration to make sure it doesn't simply wither and die.

The time training sessions are conducted depends, of course, on location, although most shade tree supervisors prefer to schedule their sessions during the winter months, which is generally a "slow" season in many sections of the country because of inclement weather.

"Certain programs relating to specific seasonal work, such as tree spraying, should be held just prior to the start of operations," Vaydik remarked. "It has been proven that training on proper spray methods given in December will produce little results in July."

Vaydik described how City Forester Wilbur Brown, who works in Vaydik's department in Kansas City, carried out a typical training series. After surveying all forestry operations to see what kinds of work are actually done and what is needed to implement skills in doing these things, Brown confers with his foremen. In one case, it was decided that a training session in spraying techniques and operation of the mistblower was needed.

Brown selected March for the mistblower training period, since his men would then be ready for early spring spray operations.

First, the men were given a



Training program for arborist crews was explained by Frank Vaydik (left) who illustrated a point for Professor E. W. Zuckauskas of Texas Tech in Lubbock.

lecture explaining the purpose of the current campaign, which was control of Dutch elm disease. Then a film called, "Recognition and Control of Dutch Elm Disease," supplied by an oil company, was shown.

Next, a film on the nomenclature, assembly and disassembly, and maintenance of the mistblower pump was shown and discussed thoroughly. As a final measure, the mistblower itself was demonstrated by a representative of the supplier, after which each man was given an opportunity to operate the machine.

When it comes time to train employees in general arboriculture, techniques must be altered to suit the subject being taught. "Pruning and repair of trees and shrubs, for example, are best taught by demonstration; so the class is taken into the parks for this facet of its indoctrination," Vaydik revealed.

"Our men are also required to work on lawn areas certain times of the year so we give them some basic instructions in turf management. We also require that they be familiar with more common insects and diseases of trees, shrubs, and evergreens, as well as control methods," the Kansas City park supervisor continued.

In conclusion, Vaydik repeated his colleagues' plea for training in public relations. "The worker in the organization usually has more contact with the general public than the supervisor," he said. "Therefore, the men must be taught the proper way to deal with the public. This is extremely important to those of us engaged in government operations because our funds depend to a degree on our image. Well-trained men give us that image."

Suit Tree to Site

Since the selection and planting of trees is becoming as important to arborists in general as the control or maintenance of trees, delegates welcomed an address on the opening day of the 40th Convention on how to plant the right tree. A. F. DeWerth, from the Floriculture Section, Department of Soil and Crop Sciences, Texas A&M University, was on hand with a timely discussion of this subject.

DeWerth feels trees are the most crucial factor in the planning and management of landscapes, and that tree selection is therefore of extreme importance.

Trees vary in size; form (whether erect, spreading, open headed, etc.); and texture (whether dense or coarse textured, filamentous, etc.). They also vary in ornamental characteristics. With the variety of trees available, what are some of the practical considerations in tree selection? DeWerth outlined them as follows:

(1) *Rate of growth*: sometimes, when there are no trees, a rapid-growing tree, for example, may be needed;

(2) *Light requirements*: whether tree is to grow in sunny or shady conditions; pertains mostly to small trees;

(3) *Exposure*: prevailing winds should be studied; where strong winds are prevalent, trees with brittle or soft wood or very shallow root systems should be avoided;

(4) *Utilities*: check presence of underground pipes or drains to see if vigorously growing root systems will be objectionable;

(5) *Maintenance*: what diseases, insects, etc. is the tree subject to; will its foliage cause so much litter that it will require a cleanup crew periodically, etc.;

(6) *Location*: watch for lawn areas where dense shade will harm turf; or where a tree may grow into structures; and

(7) *Enrichment*: this is the most variable requirement, and deals with relationship of tree to its surroundings on an esthetic basis; what color foliage, blooms, etc.; when will the tree flower, etc.

Dr. DeWerth concluded with an extensive discussion of the points above and supplied delegates with charts outlining trees suitable for the Texas area in which he conducts his research.

In educational sessions during the first day, delegates had a chance to hear latest technical

developments in maintenance of tree lawns, and what is new in tree insect control. Chairman of this section was Joseph A. Dietrich, Park Superintendent from Greenwich, Conn., who was later named president of the ISTC for the coming year.

Problems of keeping tree-lawns well maintained are of intense concern to many arborists. Discussion of this topic was offered by Dr. Ray A. Keen, from the Department of Horticulture, Kansas State University, Manhattan. Dr. Keen outlined several useful rules for his audience, pointing out that while some people manage to produce good turf beneath trees, it is still a difficult task in most cases.

General practices of good turf management should be observed, including mechanical renovation when soil is compacted but a stand of turf has already been established.

Chickweed and nimblewill are among the "shade-loving" weeds, and sometimes turf diseases also are more prominent in shaded areas.

As one interesting alternative to turf beneath trees, Dr. Keen suggested groundcovers, but reminded his audience that these are not useful where there is a lot of traffic.

One delegate asked if it would be possible to thin trees by pruning, thereby permitting more sunlight to infiltrate to the area below. Dr. Keen said this might have value if it were done prudently, and by a professional.

Galls, Beetles, Nematodes

Following Dr. Keen's address, a trio of tree pest experts examined a triumvirate of afflictions which included hackberry gall, southern pine beetles, and nematodes.

First of the three, Clyde R.

City arborists have lots to smile about, remembering how they have improved the lots of our cities' trees. St. Louis tree supervisor Edward Schrader (left) recalled how he found things in his city several years ago while Richmond's smiling arborist Jim Oates beamed his sympathy.





Enjoying the chance to try new pieces of equipment, arborists wandered from display to display during the ISTC's mammoth equipment show.

Butler, a tree-ailment diagnostician from Dallas, explained the biology and control of hackberry gall insects.

The hackberry is a common tree in Texas, Butler said, and trees affected by the hackberry gall must constantly put out new leaves to stay alive. These afflicted trees grow consistently weaker because of a lack of food, and thence become more susceptible to other pests such as the webworm.

For control, Butler recommends an early spring spraying with a mixture of 1 pt. 55% malathion and 1 pt. 20% lindane (gamma isomer of benzene hexachloride) in 100 gals. of water. Be sure to spray before gall starts to swell, he cautioned.

Analysis of southern pine beetles came from Dr. David E. Ketcham, Forest Service, U.S. Department of Agriculture, Alexandria, La.

"Although pine bark beetles are probably our most destructive group of forest insects," Dr. Ketcham said, "they can also cause terrific losses to pines used as shade trees or ornamentals."

The *Ips* engraver beetle and the black turpentine beetle (*Dendroctonus terebrans*) are the most common bark beetles attacking ornamental pines.

Since the *Ips* engraver beetle and the southern pine beetle introduce blue-staining fungi (*Ceratocystis* spp.), trees cannot be saved once they have become infested.

However, Dr. Ketcham said, the black turpentine beetle does not carry these fungi. Therefore, trees recently infested with this insect can be saved by spraying infested portions with a 1%

emulsion of gamma benzene hexachloride in water.

Nematodes, Far Out Pests

Final discussion of Monday's program concerned nematodes and their effect on trees. These bizarre and exotic organisms are only recently beginning to be understood, and the discussion by Dr. John L. Ruehle was of note.

Ruehle, who is with USDA's Southern Forest Experiment Station in Athens, Ga., pointed out that nematodes are in fact "roundworms," and that their chief symptoms are really those of general debility, since damage wrought by the soil-borne pests is felt in the entire functioning process of the tree as it gathers nourishment from the soil.

Nematodes affect tree seedlings, and the best control that can be achieved lies largely in soil treatments of various types before planting, treatments such as soil fumigation.

In mature plants, unfortunately, the role of nematodes is



Yelenosky: "No simple answers to soil aeration problems."

even less fully understood. Continuing research, Dr. Ruehle said, is aimed at the ultimate solution of the nematode problem in all crops, including turf and trees.

ISTC's Soil Aeration Search

During talks on Thursday before the final banquet and convention windup, three highly technical discussions of tree ailments kept the attention of the gathering despite the fact that it was the fourth consecutive day of talks, demonstrations, and panels.

Highlighting the three was a presentation, by Dr. George Yelenosky, Department of Botany, Duke University, Durham, N.C., of results of ISTC research at Duke into tolerance of trees to deficiencies of soil aeration.

This research is of a continuing nature, and Dr. Yelenosky's current report was an elaboration and updating of the 1963 results which he presented to the convention in Toronto last year. (W&T, Sept. '63, W-18.)

"Research for the past three years at Duke University under the sponsorship of the International Shade Tree Conference indicates that various species of trees differ in their tolerance to poor soil aeration," Yelenosky said. Seedlings of seven species of trees were used and aeration tests included flooding experiments; experiments where root systems of growing seedlings in soil in pots were sealed off from atmospheric air and also, where the soil was saturated with various gases; and respiration experiments of excised root tips from seedlings growing in sand.

American elm seedlings, Dr. Yelenosky reported, were found to be the most tolerant to poor soil aeration and tulip tree seedlings the least tolerant.

Intermediate between the two cited above stand such trees as little-leaf linden, "Moraine" honey locust, white oak, sugar maple, and flowering dogwood.

There are as yet no simple and straightforward answers to the problems of tree growth and soil aeration. Dr. Yelenosky suggests, on the basis of information obtained in his current study, that "preventive action" be one of the cardinal rules: be conscious of poor soil aeration; avoid excessive moisture in soils for prolonged periods of time; be cautious when applying fills around

trees; evaluate the effects of soil compaction, road construction, and other barriers to gas diffusion near roots of trees; do not ignore gas leaks near roots of trees; and finally, start corrective action as soon as poor soil aeration is definitely recognized.

Decay in Living Trees Studied

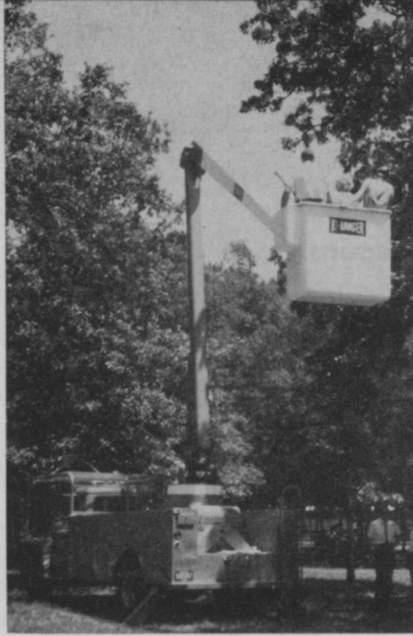
Another on Thursday's technical lineup was Dr. Ray R. Hirt who discussed evidences of decay in trees. Dr. Hirt is Professor Emeritus, State University College of Forestry, Syracuse (New York) University.

"During my professional life," Dr. Hirt said, "I have served quite a number of times in court as an expert witness on cases involving serious injuries and sometimes death, caused by falling trees and branches, almost all of which were associated with wood decay. Such cases invariably rest on the fact that evidences of weakness were plainly visible and recognizable prior to the accidents. These experiences have impressed me with the importance of recognizing decay in trees located where structural weakness is a threat to life and property." Dr. Hirt is convinced that many accidents could have been avoided by early recognition of the decay factor, and believes this detection should be an accomplishment of every well-trained, experienced arborist.

One of the best evidences of decay in trees is the presence of fruit bodies or conks of wood decay fungi. The conks of the more serious wood destroyers usually are not produced until decay is well advanced, at least in a localized area. "Thus the presence of certain fungus fruit bodies," Dr. Hirt emphasized, "means that decay is already developed."

Another clue to decay in living trees is distortions of trunks. "Tree trunks of healthy trees are relatively uniform in shape and taper, thus unusual distortions in taper and in circumference should be viewed suspiciously," Dr. Hirt warned. Pronounced, localized trunk irregularities are sometimes designated as cankers, the expert added, and fruiting structures of wood-rot fungi may occur on the face of the cankers. "Such a combination, of course," he said, "indicates internal decay."

Another symptom which may herald decay are acute-angle crotches. Dr. Hirt said many of



Aerial lifts, a crucial piece of equipment for the arborist, also can be fun for delegates' children.

our select ornamental trees produce branches and secondary trunks at very acute angles with the main trunk. Probably most elms and sugar maples are prone to do this, he interjected. As the trunk and acute-angle branches increase in diameter, the adjacent sides establish severe pressures, sometimes sufficient to kill the bark at the areas of pressure and expose the sapwood.

Since these crotches are places of mechanical weakness, they eventually may crack. Debris accumulates in the cracks, keeps the exposed sapwood moist, and hence provides an excellent location for the development of wood decay fungi.

Other inducements to decay development cited by Hirt included wounds which may also offer inroads to windborne spores of wood-decay fungi. Even though wounds are painted, when they're fresh, with a protective tree paint, when wood beneath the paint dries, minute cracks eventually appear.

Another technical presentation late in the convention's final hours was a penetrating analysis of littleleaf disease in pines by Dr. John S. Boyce, Jr., of the

Department of Plant Pathology, University of Georgia, Athens.

Dr. Boyce thinks the littleleaf story is a fascinating one. He defined the disease as an ailment which afflicts shortleaf and, to a lesser degree, loblolly pines from Virginia into Mississippi. While of major interest to forest growers, it also attacks pines grown for shade tree use.

In early stages there is a slight yellowing of the foliage, shortening of current needles, and reduction in shoot growth. The tree crown appears off-color in sunlight. "As the disease progresses," Dr. Boyce said, "the crown becomes sparse and ragged, the needles are very short and yellow, and the foliage is in tufts."

Trees less than 20 years old rarely have littleleaf, and it usually develops in stands 30 to 50 years old.

Reason for the development of littleleaf disease is apparently a complicated relationship between a cinnamon fungus present in the soil, and poor soil conditions. Neither alone produce littleleaf, but the two together can and do.

"What can be done about this disease of complex cause?" Dr. Boyce asked. "The arborist is fortunate because he can resort to a treatment that is too expensive to use under forest conditions. He can fertilize."

One phase of research has shown that heavy nitrogen fertilization in the early, typical stages of littleleaf results in the disappearance of symptoms for several years afterward. This has resulted in the recommendation that, to treat or prevent littleleaf, a commercial 5-10-5 fertilizer at the rate of 1 ton per acre, plus one-half ton of ammonium sulfate or sodium nitrate, should be broadcast in the spring over a 50-foot-wide area about each tree.

Next year's ISTC convention, expected to be one of the biggest ever, will meet in Washington, D.C. (Dates to be announced.)

Delegates remained attentive right up to the final session, when this group shot was made.



QUACKGRASS (*Agropyron repens*)



Quackgrass is a persistent perennial grass which is sometimes called couchgrass. It reproduces both by seed and by the spreading of underground rootstocks. Believed to have been introduced into North America in the late 1830s, it has spread across the continent. It survives best as a cool-season grass. It does not flourish in the South.

All of the Northern States consider this weed a primary noxious plant because its seeds often contaminate other seed mixes. Quackgrass is found in cultivated fields, wastelands, and in lawns.

Stems of quackgrass are hollow and may grow to a height of 3 feet. Leaves are dark green and the lower leaf sheath is distinctly hairy. Others have sparse whitish fuzz on the upper side.

Seed heads of quackgrass resemble wheat. Flowering parts are borne on two sides of the terminal spike. The spike is 2 to 4 inches long. Each small spikelet bears 4 to 7 seeds.

Each seed is long and slender, spindle shaped, yellow brown, and enclosed in a chafflike glume. Each glume has a short point or awn and carries three to seven distinct nerves.

New quackgrass plants are produced at every joint on the underground stems or rhizomes. This habit makes quackgrass a difficult species to control.

Sodium chlorate is a soil sterilant which will kill quackgrass and is used only for isolated patches. TCA (trichloroacetic acid) may also be used.

Dalapon and amitrol are used as foliage sprays for quackgrass control and are especially effective if combined with cultivation. Simazine, atrazine, and diuron at 4 to 10 lbs. per acre give good control. These chemicals give a short-term soil sterilization.

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

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

Organic Fertilizers Prevent Burn on Bermudagrass Turf

To prevent fertilizer burn on tender turfgrasses, agronomists W. R. Thompson and C. Y. Ward of the Mississippi State Experiment Station, State College, suggest use of organic fertilizer sources in a release (Information Sheet 839) issued earlier this year.

Organic sources of nitrogen and other nutrients provide longer lasting supply with less danger of fertilizer burn than if a soluble nitrogen source is carelessly used, the researchers assert.

Tests were conducted in 1962 and 1963 on Bermudagrass plots (Tifgreen and Tiffine) which were managed under lawn conditions (mowed at 1 inch).

Three nitrogen sources were tested, cottonseed meal (6.6-2.5-1.8 analysis), activated sludge, and ammonium nitrate (a soluble nitrogen source).

Results of the tests showed that an 8-lb.-per-1,000-sq.-ft. nitrogen rate for all three sources is better than a 4-lb. rate. Turf developed disease symptoms with all three sources at the 4-lb. rate.

Bimonthly applications of fertilizer were classed as superior as compared with seasonal and monthly applications. Bimonthly applications held high turf quality throughout the growing season.

Cottonseed meal, a competitively proved product in southern states, compared favorably with sewage sludge and the liquid ammonium nitrate on its ability to supply needed nitrogen. None of the three caused turf damage upon application, the report states. All three treatments were washed into the soil with irrigation immediately following application.

Northwest Applicators to Meet

The first conference of the Northwest Chemical Applicators Association is scheduled to be held Nov. 30-Dec. 1, Chinook Hotel, Yakima, Wash.

Complete details of the event will be given in the October issue.

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Liquid Tritac is available in cartons of six 1 gallon cans; also 5 gallon cans and 30 gallon drums;

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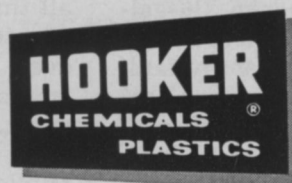
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Dormant Season Brush Control

(Continued from page 11)

the past ten years have conclusively answered this question in the affirmative. The following is a description of the dormant season spray technique, often referred to as "Dormant Cane Broadcast."

Materials

The toxicants used in this method are the oil-soluble formulations of 2,4-D and 2,4,5-T. In rights-of-way where more susceptible species such as willow predominate, a D/T mixture may be employed. However, for maximum kill, especially in areas where more resistant species such as ash, maple, and oak predominate, it is best to use a straight 2,4,5-T material.

The carrier used in dormant season spray programs is straight oil. The sole prerequisites for this oil is that it should be fairly clean, free of water, and not overly viscous during cold weather. Common oil carriers employed in the past have been diesel oil or number 2 fuel oil. The author has even employed used transformer oil effectively.

Rate of Application

Effective woody plant control has been obtained using concentrations of 4-12 lbs. acid equivalent per 100 gallons of oil. The lowest rate giving the most consistent control is 6 pounds aehg (acid equivalent per 100 gallons) of oil. Normal coverage is generally obtained with an average use of 150 gallons of the oil-toxicant mixture per acre. This will vary between 100-200 gallons per acre depending upon stem height, density, and the method of application used.

Equipment

Dormant season applications have been made with equipment ranging from a Hudson 2½-gallon garden sprayer to a specially built rig containing a spray tank with 3,000-gallon capacity. Naturally, the larger the spray program the greater the need for a relatively larger size spray tank. Pump pressures have ranged from the minimal produced with hand pumping to 150 pounds per



While there are no particular hazards in dormant cane methods, VPI researcher Ira Moore plays it safe by wearing a respirator while testing the system for spraying brush after leafdrop.

square inch. Usually 80-100 psi are sufficient to obtain adequate coverage. However, where one is spraying into a wind or covering a wider rights-of-way area, the "higher" pressures may be more suitable. A pump with the capacity of 5-10 gallons per minute would be adequate for most programs. The type of pump used is irrelevant and the applicator should use the one with which he is most familiar and which has given the best operating results in other spray programs. Gunjets with both the trigger-type and turning shut-off valves have been used effectively. Orifice disc numbers D-6, D-10, and D-12 have been employed successfully. It should be noted that the applicator need not be limited in his equipment and, in fact, equipment that he is already employing will in most instances be suitable for dormant season spraying. In foliage spraying, an emulsifiable concentrate is used so agitation in the spray tank is essential. In dormant season work, since an oil-soluble formulation is used, all that is really necessary is adequate initial mixing. However, even in this situation agitation would be beneficial. "If it will work for foliage applications, it will work for dormant season applications," is a good rule of thumb to keep in mind. The above-mentioned variables should be tested until the best

combination of equipment components is discovered for the given applicator's specific needs and goals.

Methods of Application

There are two proven methods of application available to the applicator:

First, there is the broadcast treatment which is aimed at covering the entire stem area of every woody plant. This method is best employed in dense stands of shorter material (4-6 feet tall) especially when one is spraying from a truck from above the woody plants to be sprayed. This method should also include a special effort to concentrate the spray around the root-collar area at the ground line.

Second, there is the modified basal treatment in which the aim is to concentrate the spray over the lower third of the woody plant stem, again with special emphasis on the root collar. This method is best employed on taller growth (15-20 feet) where it would be less feasible to cover the entire above-ground portion of the plant. When this method is followed, there may often be a lag in killing effect in the spring. Usually with the first method, budding out will be almost entirely eliminated. However, with the modified basal method some buds will develop and leafing out will occur. If coverage has been adequate,

though, these leaves will never develop but will wither and die. This phenomenon is often termed "flagging." It in no way approaches the unsightliness associated with "brown-out."

It should be noted that dormant basal sprays should *not* be expected to give a complete kill when the predominate brush species are the root-suckering types, such as black locust, sumac, sassafras, aspen, and persimmon. Dormant basal sprays give almost 100% top kill of these species and control root-collar sprouting, but do not prevent root suckering. Root suckering is best controlled with 6 lbs. aehg of amine D & T in water applied as a ground stem-foliage application during the growing season or by 6 lbs. per acre of D & T ester applied as a thickened material from helicopters.

The above-mentioned application methods should be used only on woody material with a diameter no greater than 5-6 inches. They are most effective when used on woody plants with stems in the 3-4 inch diameter range. Bark thickness may be a limiting factor in these applications. The greater the bark thickness the more difficulty will be encountered in getting adequate amounts of chemical into the live internal tissues to be killed. These treatments are geared for large-scale overall applications and not the more individual basal bark treatment which employs a more concentrated spray mixture. The coverage with all the above methods should also be such that the spray mixture completely encircles the circumference of the stems with special emphasis on hitting the root collar. On plants with smooth bark and only 1-2 inches in diameter, the "creep" of the oil often will accomplish this with normal coverage. However, on broader, rough-barked species, a special effort should be made to hit as many sides of the stem as possible, since the natural creeping tendency of the oil will be impeded. This may be accomplished by handling the spray gun in a sweeping motion and spraying any given stem

area (1) as one approaches the stem area, (2) when directly abreast of the stem area, and (3) as one passes it. Where more than one gun is mounted on a stand, the guns should be aimed at different heights and different angles. On mounted truck rigs, the rate of speed should be maintained at about five miles per hour.

Time of Application

There appears to be no best time of application during the dormant season. The first and last dates are fairly well defined, however. The first dormant season application should be made in the fall after the leaves have dropped. Once growth has stopped, material sprayed on the leaves will only be lost upon leaf drop. The last application should be made no later than two weeks prior to the initiation of bud growth in the spring. The reason is not clear, but treatments made just prior to or just following bud opening are relatively less effective and should be avoided.

Applications should not be made immediately following heavy rain. Bark absorption and penetration are greater when this oily material is applied to dry stems. It is also best if dry weather prevails for several hours following application. Successful applications have been made where an inch or two of

Conn. Ag Station Works On New Dutch Elm Study

Plant pathologists at Connecticut Agricultural Experiment Station, New Haven, are experimenting with a new group of chemicals that may provide one method to combat Dutch elm disease.

Among the materials being tested are mixtures of isomers of aminotrichlorophenyl acetic acid. Dr. Lloyd Edgington and investigators in Wisconsin have determined that the compound causes changes within the tree that mechanically block the spread of the fungus. The exact nature of this blocking action is now under intensive study.

snow has covered the ground. However, spray applications over deep snow should be avoided, since coverage of the critical root-collar area would be adversely affected.

A review of the ideas presented above will show the following advantages of a dormant season application:

1. Elimination of objectionable "brown out."
2. Elimination of crop damage complaints. Annual crops are not growing at the time of application, and by early spring the 2,4,5-T is broken down by soil microbes and is inactive.
3. Extension of the operational program in brush control to 6 to 8 months.
4. Less sprouting of resistant species as compared to stem-foliage or basal treatment (due often to more complete spray coverage).
5. One-half of the volume is required as compared to stem-foliage treatment.
6. Application requires less time than basal treatment (and often less than stem-foliage treatments).
7. Lower pressure and smaller hoses are required than used with stem-foliage treatment.

Dormant season spraying has proven to be a definite addition to the useful techniques the rights-of-way maintenance man has available to him. Therefore, it would be of extreme importance to everyone who cannot possibly control brush to his complete satisfaction using a summer spray program to consider and investigate spraying woody plants while they are in a dormant condition.

**Next Month:
Why a
National Organization
of Applicators?**

Iron Shortage May Cause Yellow Color on Pin Oaks

Pin oak trees having a yellow, anemic appearance, and some die-back of terminal branches may be suffering from a condition due to an iron deficiency. This condition may be more pronounced in areas where the soil pH is high and where extremely dry conditions prevailed in 1963, says Dr. R. E. Partyka, Ohio State University extension plant pathologist.

Inspection will show that principal veins remain green and the tissue between the veins takes on a yellow appearance. In advanced stages, the yellow tissue begins to break down and has a flecked appearance. The dead areas are brown to brown red. Terminal growth of the twigs is small and the trees may be stunted.

When detected soon enough, this condition may be controlled by spraying leaves with an iron chelate or by applying it in the soil according to the manufacturer's directions, Dr. Partyka says. Another method is to spray with ferrous sulfate at 2½ ozs. to 3 gals. of water, plus 1 oz. of soybean flour. The soybean flour acts as a sticker.

For a more lasting treatment apply a 50-50 mixture of ferrous sulfate and sulfur, using 1 lb. for each inch of trunk diameter, or for shrubs 1 to 1½ lbs. of this mixture for each 100 square feet. The material should be placed in holes in the active root zone and watered.

Other plants such as roses, small Chinese elms, gardenias, rhododendrons, azaleas, and maple trees may also show iron chlorosis.

Waverly Has Soil Conditioner

A soil conditioner composed of specially calcined, inorganic mineral earth is particularly recommended for use by greenskeepers and managers of other fine turf areas, Waverly Petroleum Products Co. reports.

The material, named "Soil-Add," is weed free, in stable granular form, and has high water-absorption qualities, Wa-

verly says. It is designed for economical use as a top dressing or as part of the soil mixture during original construction of golf greens, lawns, and other grass surfaces.

Bulletin No. SA-63-1 gives complete data for the use of Soil-Add. For a copy of the bulletin write Waverly Petroleum Products Co., Minerals Div., 3018 Market St., Philadelphia 4, Pa.

Advice on Cool-Season Grasses

A regular program of watering and mowing the cool-season grasses, bluegrass and fescue, needs to be maintained when rainfall is lacking.

This reminder comes from Claude W. Derting, horticulturist at Kansas State University. He also adds that fertilizer should not be applied to these grasses between June 1 and September 1.

"Bluegrass and fescue grow most luxuriantly during the spring and autumn. The stress of heat and lack of moisture soon slows their growth during hot summer weather. When rainfall is lacking, application of one to two inches of water, preferably two inches, should be made at weekly intervals," Derting suggests.

Another important practice in maintaining bluegrass and fescue lawns, Derting said, is mowing. These grasses should be mowed regularly 2½ inches high or higher. Mowing regularly at least weekly will prevent too much top growth. No more than one-third of the top growth should be removed at each mowing. These practices prevent weakening the stand of grass and retard crabgrass growth.

"In contrast are cultural practices of the warm-season grasses, Bermuda, zoysia and buffalo. Fertilizer should be applied in the summer if growth is poor. The fertilizer must be watered in, and these grasses should be mowed regularly at heights of one inch or less. Twice-a-week mowing of warm-season grasses is recommended for good appearance and growth," Derting added.

Meeting Dates

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- Alabama-North Florida 5th Annual Turfgrass Short Course, Auburn Univ., Auburn, Ala., Sept. 10-11.
 - Canadian Agricultural Chemicals Assn. Annual Meeting, Chateau Laurier, Ottawa, Quebec, Sept. 13-16.
 - Midwest Regional Turf Foundation Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.
 - Ohio Agricultural Experiment Station, Lawn and Ornamentals Day, Columbus, Ohio, Sept. 15.
 - Illinois Turfgrass Foundation Field Day, University of Illinois, Urbana, Sept. 18.
 - University of Missouri Lawn and Turf Conference, Columbia, Sept. 23-24.
 - Society of American Foresters Annual Meeting, Hilton Hotel Denver, Colo., Sept. 27-30.
 - Mississippi Nurserymen's Assn. Meeting, Hotel Heidelberg, Jackson, Oct. 2-3.
 - Rutgers University Turfgrass Equipment and Products Field Day, New Brunswick, N. J., Oct. 10.
 - Central Plains Turf Grass Foundation Meeting, Umberger Hall, Kansas State University, Manhattan, Oct. 21-23.
 - Washington State Weed Conference, Chinook Motel and Tower, Yakima, Nov. 2-3.
 - National Fertilizer Solutions Assn. Meeting, Statler-Hilton Hotel, Dallas, Texas, Nov. 3-5.
 - Oklahoma Turfgrass Conference, Student Union, Oklahoma State University, Stillwater, Nov. 4-6.
 - Oklahoma Turfgrass Association Annual Meeting, Student Union, Oklahoma State University, Stillwater, Nov. 4.
 - Horticultural Spraymen's Assn. of Florida Annual Convention, Pier 66 Hotel, Ft. Lauderdale, Nov. 5-6.
 - National Weed Committee of Canada, Eastern Section Meeting, Quebec City, Nov. 5-6.
 - Northwest Chemical Applicators Assn. Annual Conference, Chinook Hotel, Yakima, Wash., Nov. 30-Dec. 1.
 - National Weed Committee of Canada, Western Section Meeting, Royal Alexandria Hotel, Winnipeg, Dec. 1-3.
 - North Central Weed Conference, Inc. Meeting, Kellogg Center, East Lansing, Mich., Dec. 14-16.

HSAF Conventioneers to Organize National Assn. of Weed, Turf, and Tree Spraymen

Major highlight of the Horticultural Spraymen's Association of Florida annual convention this year will be the establishment of a national association of weed, turf, tree, and ornamental spraymen, Larry Nipp, convention chairman, has announced in a special release to *Weeds and Turf*.

Ft. Lauderdale was chosen as the site for the historic meeting, set for November 5 and 6 at the Pier 66 Hotel there. In addition

Rutgers to Display Turf Aids At Field Day October 10

Exhibits and demonstrations of a wide range of turfgrass equipment are scheduled for Rutgers University's first annual Turfgrass Equipment and Products Field Day in the university stadium in New Brunswick, N. J., Oct. 10.

Other attractions include educational displays featuring turfgrass species, turf weeds and insects, ground covers, and turf diseases.

There will also be a lawn clinic which will help delegates diagnose specific turf ailments.

Rutgers officials say the Field Day will provide manufacturers and suppliers of turfgrass equipment and products with an opportunity to display and demonstrate their wares.

The program is designed to serve interests of turf professionals associated with contract maintenance companies, industrial grounds, landscaping services, parks, golf courses, and homeowners, Rutgers spokesmen revealed.

Sponsored by the school's Agricultural Extension Service, the Field Day is being coordinated by turf extension specialist Dr. Henry W. Indyk and Martin Decker, extension specialist in agricultural engineering. More details are available from either at the Extension Service, College of Agriculture, New Brunswick, N.J.

to the formation of a nationwide trade group of contract applicators in the vegetation maintenance industry, delegates will be treated to a massive display of new equipment for horticultural spraying. A technical program featuring leading scientists from Florida turf institutions is also in the offing.

Nipp, who runs American Power Spraying in Ft. Lauderdale, said the formation of a national association should be "of great interest to our northern friends in the industry," and urged applicators from other states to attend the November meeting if at all possible.

A demonstration of tree, lawn, and shrub-spraying techniques will be featured along with the equipment display. There is also to be a question-and-answer session in which panelists will discuss problems sent in prior to the meeting, as well as questions from the floor.

Future legislation and industry regulations will be analyzed, and there is to be a discussion of pricing methods and policies for

various types of spray programs.

Nipp said further details would be sent to *W&T* as soon as they are available. In the meantime, those who wish more information about the November convention are invited to write Nipp at 3675 S. W. First St., Ft. Lauderdale, Fla.

Cranco Has Tree Injection Data

"Somewhere in tree injection methods there are optimum combinations of herbicide, carrier, dilution and volume, and other factors, where desired results can be predicted with a reasonable degree of accuracy," according to a mimeograph data sheet now available free from Cranco Co., 7 Clermont Ave., Trenton, N.J. 08618

Cranco's data sheet outlines how to achieve quality and cost control with the D/C "yardstick" method for measuring tree injection spacings. (D/C stands for diameter inches per cut.)

A number of tables are also included in the mimeographed form, which is suitable to use with the Cranco Tree Injector. For copies, write the company at the above address.



How to remove an injured man from a tree was dramatically demonstrated by this crew from the Asplundh Tree Expert Co. during the Delaware Chapter, International Shade Tree Conference Meeting July 28 in Morris Arboretum, Philadelphia, Pa. Asplundhman Melvin Sears was in charge of the safety exhibition. According to George T. Lewis, Chapter secretary-treasurer, the annual affair was highly successful, including an attendance of 57, with several demonstrations and discussions pertaining to tree service.

Entomologists Look To Resin and Blue-Stain to Control Bark Beetles

Three new methods of bark beetle biological control are being investigated at the Agricultural Experiment Station in Gainesville, Florida, the magazine, *Research Report*, discloses in its July 1964 number.

Researchers into these new control concepts are Dr. R. C. Wilkinson, assistant entomologist, and W. C. Yearian, research assistant.

Although benzene hexachloride applied to forest pines will stifle attacks by bark beetles (Genus *Ips*), the chemical is toxic to other forest life and all infected trees cannot be treated at one time. *Ips* bark beetles cause losses of over 300,000 cords of pine each year.

By studying the biology and habits of these tiny beetles, Wilkinson and Yearian have uncovered several features which could lead to more effective control of these pests.

Highly resinous trees which exude sticky pitch may repulse or entrap males which fly to pines and try to bore nuptial chambers beneath bark. If trees can be selected and propagated for their resinous qualities, they may be rendered "beetle resistant," the researchers feel.

Male beetles secrete a powerful attractant which lures many females to the nuptial galleries. In this way bark beetle epidemics cause many tree losses in a short time. By analysis of the male's lure, the scientists feel they may find a way to lure female bark beetles away from valuable timber.

Dr. Wilkinson and Assistant Yearian think they may have a lead, which, if true, will induce sterility in *Ips* females.

When the entomologists reared beetles under clean laboratory conditions, they found that females' ovaries did not develop properly when blue-stain fungus organisms were absent.

The blue-stain fungus also contributes to forest pine losses because the beetles introduce the

fungus under the bark with their bodies. Then the organism becomes pathogenic and plugs the tree's water-conducting cells, which contributes to death.

With increased investigation, Wilkinson and Yearian hope to find out if absence of the blue-stain organism definitely does inhibit fertility. If it does, then beetles may be indirectly, biologically controlled by eliminating the blue-stain organisms with a fungicide.

Unmown Bahiagrass Kept at Desirable Level with MH

Maleic hydrazide (MH) has shown to be an effective bahiagrass growth inhibitor in experiments, at the Gainesville, Florida, Agricultural Experiment Station, conducted by Dr. O. Charles Ruelke, assistant agronomist with the University there. His work is described in the July 1964 issue of *Research Report*.

According to Dr. Ruelke, "in the very near future, satisfactory grass cover can be maintained without frequent mowing to get rid of unsightly seedheads."

Bahiagrass is used in yards, parks, roadsides, and airports in Florida. Constant mowing is necessary to keep seedheads from forming.

Tests with maleic hydrazide at 0, 2, 4, and 8 lbs. per acre of active ingredient on unmowed plots of Pensacola bahiagrass showed first season control after light fertilization is better, and produces no damage when the 2 or 4 lb. per acre rate is used.

"At 2 and 4 lbs. per acre after the first season application, plots remained shorter and darker than unmowed, untreated plots. Eight lbs. definitely injured grass; browning and purplish regrowth occurred," Dr. Ruelke discloses.

Dr. Ruelke says that all plots received a light nitrogen application just before MH was applied.

In September of the first year grass height was measured and seedheads were counted. Results were as follows:

Rate	Ave. Ht.	Seedheads per sq. ft.
No. MH	10"	9
2 lbs./a	9"	2.7
4 lbs./a	7"	0.7
8 lbs.	6"	almost 0

By the following spring all the plots looked the same. Plots were sprayed again with MH at the same rates as the year before. This treatment gave an 80% reduction in seedheads with 2 lbs. per acre; 95% reduction with 4 lbs. per acre; and 99% reduction with 8 lbs. per acre.

One month after spraying, the grass plants were measured with the following results:

Rate	Height
No. MH	13.7"
2 lbs./a	11.3"
4 lbs./a	9.4"
8 lbs./a	6.4"

Seventy percent of the grass plants were damaged the second season with the 8-lb.-per-acre rate.

All the plots were then mowed to test their response. Regrowth of leaves and development of seedheads were much less restricted after treated topgrowth was mowed off. This showed either that mowing decreases effectiveness or that lack of good growth prevented the growth regulator from passing through-out all of the plant parts.

Dr. Ruelke feels that adequate soil fertility and ample soil moisture are both necessary to foster grass growth at MH application time. Growth improves the absorption and translocation of MH to prevent further growth and seedhead formation.

Dr. Ruelke is continuing his research into chemical grass growth regulation in order to refine techniques and devise predictable successful methods.

Ansul Builds "Ansar" Plant

Construction of a new plant for production of Ansar, new selective post-emergence herbicide, has been announced by The Ansul Co., Marinette, Wis.

According to Robert C. Hood, president, the plant will begin production in February. Annual capacity will be 20,000,000 pounds. Ansar 170 effectively controls johnsongrass and other weeds, the company says.

Oklahoma Turfgrass Conference Scheduled for Nov. 4-6

A tentative program has been arranged for the 19th annual Oklahoma Turfgrass Conference to be held at the Student Union, Oklahoma State University, Stillwater, Nov. 4-6.

Fertilization of turfgrass will be the theme of the conference. Morning and afternoon sessions will present highly qualified men in the field of fertilization and related subjects.

The welcoming address will be given by Dr. Burr Ross, dean, College of Agriculture, OSU. Response will be made by Chick Clark, president, Oklahoma Turfgrass Association.

The annual business meeting of the Association will be held in the evening, Nov. 4.



Elected to guide the South Carolina Nurseryman's Association for 1964-65 are (l. to r.) Henry Clay, executive secretary and treasurer, extension horticulturist, Clemson University; Charles Weeks, vice president, Florence, S. C.; and L. W. Moon, Jr., president, Greenville, S. C. Election took place at Clemson University June 23 while association members were at the Second Annual Nurseryman's Short Course. Over 100 persons, including representatives from other states, attended the course.

Mo. Turfmen Meet Sept. 23-24

Turf experts from all over the country will be on the program at this year's Lawn and Turf

Conference on the University of Missouri campus in Columbia, Sept. 23-24.

According to Delbert D. Hemphill, professor of horticulture at the University, the conference is designed to be of interest to contract applicators,

greenskeepers, superintendents of parks and institutional grounds, and other turfgrass professionals.

More information is available from Professor Hemphill, Agriculture Building, University of Missouri, Columbia.

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HELP WANTED

WEED CONTROL SALES. Large company recently expanded into industrial weed control needs man experienced in application and sales to head this department in Philadelphia area. Must know chemicals, equipment, methods of plant control and be able to sell and organize work. Salary and commissions, Car provided. Please reply giving complete background, including education, details of past employment and earnings, experience and personal references. Box 3, Weeds and Turf magazine.

Grant Spurs Plant Hardiness Research at U. of Minnesota

A plant hardiness research program by University of Minnesota horticulturists has been given new impetus with a \$195,065 grant from the Louis W. and Maud Hill Family Foundation, according to L. C. Snyder, head of the University's Department of Horticultural Science. C. J. Weiser, associate professor of horticultural science, will be research leader of the project.

Research on plant hardiness by university horticulturists may mean a drastic reduction in the millions of dollars now lost each winter from cold injury to fruit and ornamental plants. A continuous research program on hardiness problems has been conducted since 1912, but critical research has been limited up to this time because of lack of facilities.

Much of the early hardiness work was of little practical application because there was no real understanding of the basic factors involved in either winter injury or a plant's inherent ability to avoid injury, according to Weiser.

Furthermore, horticulturists have had no way of scientifically assessing the exact cause of winter injury, Weiser says. The procedure has been to observe winter injury to plants in the spring, then go over temperature records and make a conjecture as to the cause of the damage.

Now, with the use of growth chambers recently acquired by the horticultural science laboratories, it will be possible to characterize the basic nature of winter injury and the natural mechanisms by which plants become acclimated to cold. In the chambers the plants will be exposed to various degrees of cold and heat to learn their precise reactions to specific temperatures.

These findings will be applied in the programs of the Fruit Breeding Farm and the Landscape Arboretum at Excelsior in developing and testing hardy plants.

Ultimate aim of the project is to find a practical means of reducing winter injury on a field scale. Practical field treatments to reduce winter injury could save millions of dollars on horticultural crops in Minnesota alone, Weiser believes.

Establishing laboratories for research on plant hardiness is of significance to the entire continent, Weiser points out. No real center of plant hardiness research and graduate training

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exists in North America comparable to the Institute of Low Temperature Research in Japan.



A significant contribution to turfgrass research is the annual gift to Iowa State University of funds donated by the Iowa Golf Course Superintendents' Association. This year's grant, totaling \$3,500, was presented by IGCSA president R. A. Bruns, Jr., (left), to Dr. John P. Mahlstedt, head of the department of horticulture at the Ames, Iowa school.

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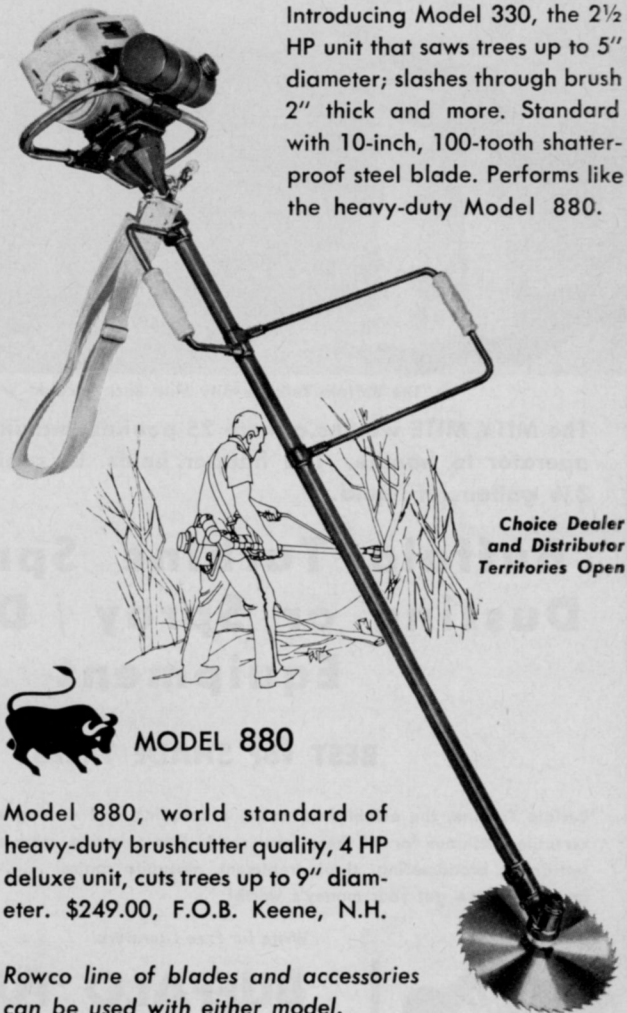
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Suppliers' Personnel Changes

California Chemical Co., Ortho Div., has designated Harris M. Carter as assistant to president J. W. Kent. Carter will handle various aspects of Ortho operations, with particular emphasis on commercial fertilizer development. In other field moves Ortho named K. J. Dietzen northern regional sales manager, home and garden products, with offices in Haddonfield, N. J.; Robert R. Johnson transfers

to Norwalk, Iowa, to assume his new post as field research specialist; and J. W. Mackenzie is now technical specialist in herbicides, a new position at Ortho's Richmond, Cal., base.

Kerr-McGee Oil Industries, Inc., has assigned Donald G. Spangenberg to manage the fertilizer-blending plant recently constructed in Sturtevant, Wis. Spangenberg is responsible for producing and marketing custom-blended fertilizers for the Sturtevant area.

Trimmings

Heavenly Bev. We'll bet we've come across one of the prettiest scientists ever to grace the laboratories of our worthy suppliers. She's Beverly Tucker, Ph. D., and she's the newest addition to the research department of California Chemical's Ortho Division, producers of herbicides and insecticides for contract applicator use. Dr. Tucker's photograph, accompanied by an Ortho news release, reached our desk just the other day, and we're intrigued to learn of the young lady's current project, which is testing the metabolic fate in soil of a new Ortho herbicide. Beverly got her doctorate recently at Purdue, and we imagine her fellow scientists, probably all male, will be happy to have her around to help!

St. Louis tree man. One of the men who's come a long way in St. Louis is reader Edward J. Schrader, Commissioner of Forestry in the city's Department of Parks, Recreation, and Forestry. Industry men who've visited the Missouri metropolis will remember the fine stands of shade trees and the extensive parks which grace the community, a fitting testimonial to Mr. Schrader's position. The city's forestry division, by the way, has an attractive emblem on its calling cards which includes a seal with the legend, "Guardian of the City Trees."

Take a gander at this. About a year ago we wrote a whimsical piece for this column in which we lightheartedly talked about the use of geese for weed control. While striving to remain circumspect and fair in our treatment of all scientific endeavors, we do confess to being a little skeptical about the process. Now we have received a lengthy news release from Clemson University which discusses, in quite serious tones, the widespread use of geese in cotton. This release says there are about a million geese hard at work weeding southern and southwestern cottonfields this year. One of the laborers formerly employed to weed cotton was reported to moan that it's bad enough to be replaced by a machine, but to be replaced by a goose is downright undignified! Moreover, even the geese don't have it so good, because when they've completed their cotton weeding labors, they're dispatched immediately to the slaughterhouse, a sad reward for days of toil in the fields! Fortunately, since the practice is apparently economically rewarding only in croplands, most of our good readers can rest assured they'll stay in business, and should not, we feel, run out and place their goose orders without some careful reflection.

Cold potato. News from the Golf Course Superintendents Association of America is that now only Idaho is unrepresented in the national group since Alaska became the 49th state with a GCSAA member. Alaskan responsible is Malcolm I. Taylor of Anchorage. There was no indication in our news source about why the Potato State remains cold to the idea.

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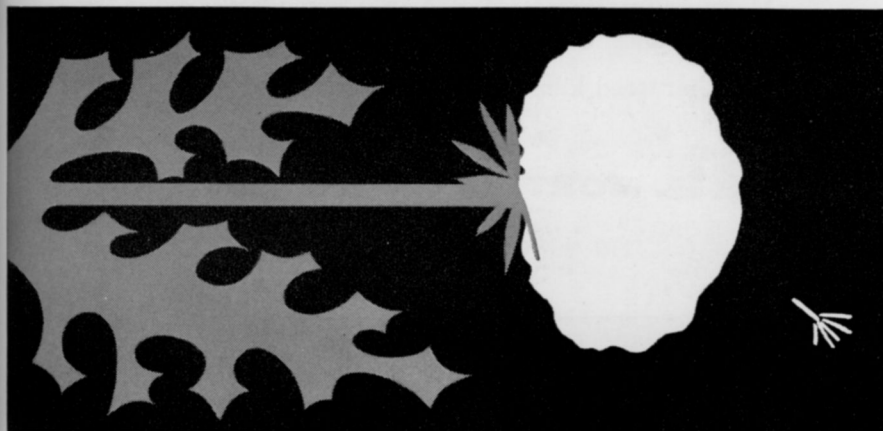
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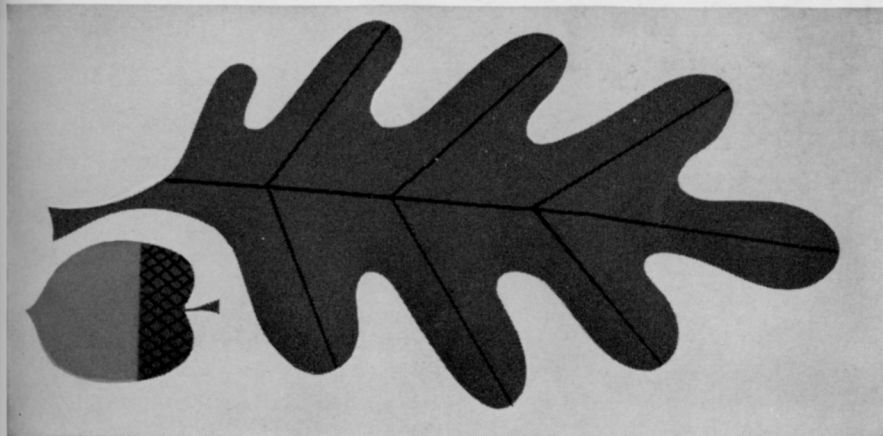




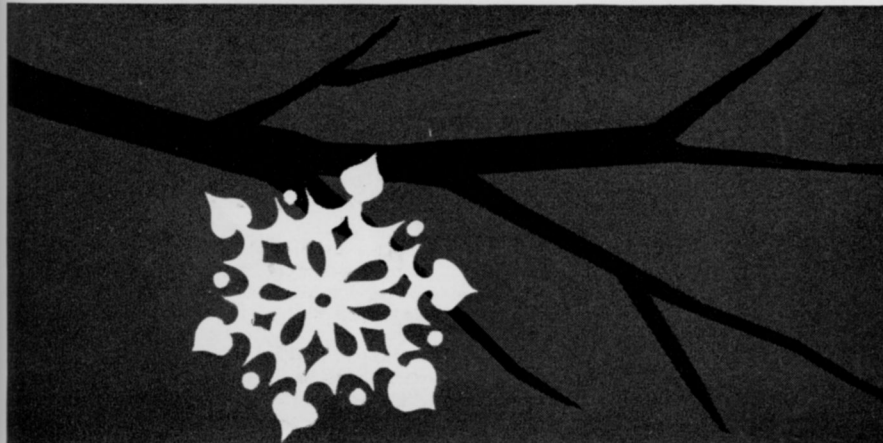
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