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 year 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.

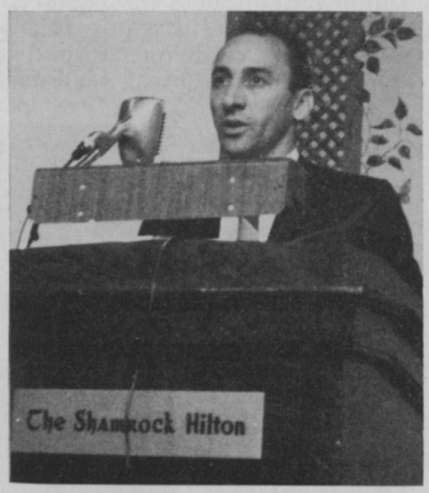
Nematodes, Far Out Pests

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 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.



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

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

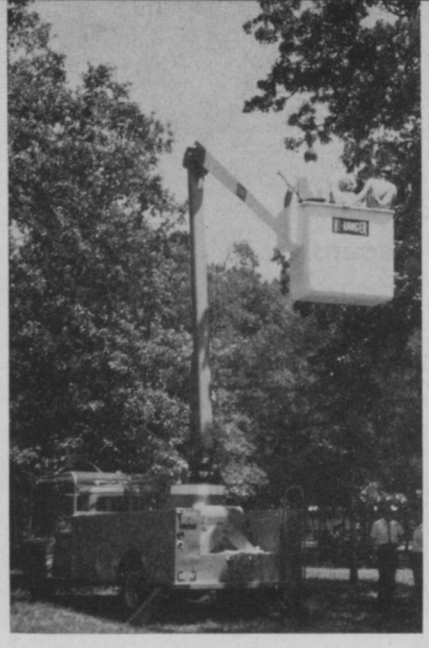
Another on Thursday's technical lineup was Dr. Ray R. Hirt who discussed evidences of decay in trees. Dr. Hirt is Professor Emeritus, State University College of Forestry, Syracuse (New York) University.

"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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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 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.

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.

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 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.

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.

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, Waverly 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

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 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.

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.

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 Reulke, 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 throughout 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.