Tractor reaches speed and incline which starts rollover.

Without safety bar tractor operator would be helpless.

Protective frame in this test protects dummy, but in regular operation would likely prevent serious injury or death to operator.

Anti-Roll Bars May Make Tractors Safer

More safety for the tractor operator may soon be built into tractors. International Harvester Company is testing a protective frame called an anti-roll bar at its Equipment Research and Engineering Center at Hinsdale, Ill.

Remote controls permit new model tractors to be driven at high speeds along a 42-degree bank and rolled at will. Electronic equipment records location and force of impact on the frame.

Strain gauges are cemented on the protective frame at various locations and connected to a radio transmitter. Sound is transmitted through radio telemetry on impact of the frame with the ground. The tone change occurring is read by a receiver and recorded on tape.

In the laboratory, tape is played back into an analyzer which translates the tone into forces exerted on the frame. The test also checks on design and mounting of the frame itself.

Such tests help researchers design and build a frame to give the operator maximum security should an operating tractor tip.

So-Called Fire Resistant Plants Are Not

Two Californians are warning home owners via a new publication not to rely on "fire-resistant plants" for protection during the brushfire season.

Such so-called fire resistant plants do not exist according to Joe R. Goodin, University of California agronomist at Riverside, and Richard Maire, Los Angeles County farm adviser. Any plant, they say, will burn if subjected to enough heat.

The larger a plant grows, the more potential fuel it produces, and the greater the fire hazard. As soil becomes dry, a plant takes up less water and has a lower moisture content. Irrigating can make the difference between an extremely flammable plant and one which will not burn as readily. Thus, the main protection is management.

Goodin and Maire pointed out that well-pruned, cleanly maintained, and irrigated areas did not carry fire during the California Bel Air conflagration of 1961. Sprinkler systems offered further protection.

Name of the new publication, soon to be released, is "Landscape for Fire Protection."

Sprayer Accessories Catalog Available

John Bean Division has published a 4-page, illustrated catalog describing the Division's line of "Agricultural Spray Accessories."

Shown are high-pressure guns, couplers, hoses, gauges, valves, filters, boom accessories and nozzles. Write L-1903, John Bean Division, FMC Corp., 1305 S. Cedar St., Lansing, Mich. 48910.

Non-Slip Floor Coating Resists Chemicals

A new non-slip floor coating that is impervious to most industrial chemicals is now being marketed. The new coating is called "Epoxo", produced by Falcon Alarm Company.

Tests show Falcon Epoxo resistant to most acids, chemicals, oil, grease, corrosives, and even salt water. Epoxo is so corrosive-resistant, Falcon reports, that it is used on the flight and weather decks of virtually every U. S. Aircraft Carrier in the first-line fleet.

Epoxo reduces accidents and helps prevent slips, skids and falls. It is designed for application around machinery, marine decks, oil rigs, loading ramps,

work areas, driveways, or any area that presents a slip hazard.

The new coating applies like butter with roller, trowel, brush or spray and adheres to any base. The maker reports a life of up to 5 years.

Colors include tile-red, grey, green, black, white and "safety orange". Five gallons of Falcon Epoxo cover up to 225 square feet. Cost is $17.50 per gallon for one to four gallons, and $15.95 per gallon for five gallons. Contact Falcon Alarm Co., Inc., 127 Stern Ave., Springfield, N. J. 07081.

Substitutes For Elms Recommended in Minnesota

Trees to replace diseased elms are being sougnt in many states.

In Minnesota, scientists at the University Agricultural Experiment Station have listed a number comparable in size to the American elm. All can be grown from seed.

Suggested are the American linden *(Tilia americana)* red maple *(Acer rubrum)*, sugar maple *(Acer saccharum)*, green ash *(Fraxinus pensylvanica)*, oak *(Quercus* spp.*)*, hackberry *(Celtis occidentalis)*, and Kentucky coffee tree *(Gymnocladus dioicus)*.

Smaller trees include ironwood *(Ostrya virginiana)*, pagoda dogwood *(Cornus alternifolia)*, river birch *(Betula nigra)*, showy mountain ash *(Sorbus decora)*, juneberry *(Amelanchier laevis)*, and blue beech *(Carpinus caroliniana)*.

Seven Times As Many Weeds At Low Mowing Heights

Weed counts on 2-year old turf showed 7 times as many weeds when cut at 1½" heights compared to 2½ inches in a University of Maryland study.

Dr. Elwyn E. Deal, Extension turf specialist, says that grass may not look greener and more attractive at the taller height. But it will be healthier, will survive summer heat and drought better, will have more resistance to disease attacks, and will have fewer weeds. Further, Dr. Deal reports that greater mowing heights do not require more frequent mowings. Regardless of mowing heights, the rule is to remove 1/3 or less of the height with each mowing. By following the rule, the low-cut turf needs to be cut more often.

The Maryland turf-weed study for 2-year old turf showed the following number of weeds per 100 square feet:

Mowing Height	Crabgrass	Broadleaved Weeds	Total
2½ inches	1.7	6.0	7.7
1½ inches	21.0	32.3	53.3

Weed counts on 1-year-old turf were much greater in favor of the higher mowing height. At the 2½" height, only 0.4 weeds per 100 square feet were spotted, compared to 15.3 weeds for the same sized area at the 1½" mowing height.

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Chemicals Control St. Augustine Grass In Bermudagrass Turf In Texas Tests

BY B. E. BORDEWICK
Associate Professor, Biology Department, Del Mar College, Corpus Christi, Texas.

Most all lawns and parks in the Corpus Christi, Texas, area are composed of St. Augustine grass. Though subject to disease and chinch bugs, by and large it is satisfactory for these purposes.

St. Augustine, however, is definitely not desirable as a golf course turf. Where it has accidentally become established on bermudagrass fairways or tee areas, as is common in older golf courses, it poses several problems. It gives an uneven, patchy appearance. More important, it greatly slows down the forward progress of a golf ball. St. Augustine grass is so coarse and tough as to often interfere markedly with proper execution of a golf shot. It is a strong competitor and ultimately may crowd out bermuda and other grasses. This characteristic is desirable in lawns and parks, but is a problem in golf courses.

To date, the only eradication methods have been either to dig out the area containing the St. Augustine or to kill the area with a non-selective herbicide and to reseed with bermuda. Neither is effective. Both leave unsightly denuded areas that tend to become weedy before the reseeded bermuda is established. Moreover, digging out large areas and reseeding is expensive and time-consuming. The practice also normally fails because any remaining sprig of St. Augustine can serve as the beginning of another patch. Further, in non-selective killing, many of the St. Augustine runners which have crept far out into the bermuda often are missed with the treatment because of hesitancy to destroy more turf than is absolutely necessary.

A selective weed-killer would appear to be the answer to this problem. A discussion of tolerances of bermuda, St. Augustine, and several other grasses for the methylated arsenicals (Callahan, L. M., *Turfgrass tolerances do differ*, WEEDS, TREES, AND TURF, Nov. 1966) indicates that one or more of these materials might be sufficiently effective in killing St. Augustine without being unduly destructive to bermuda.

Therefore, investigations were begun involving the effects of 3

Tiff Green-St. Augustine plot showing several treated rows. Row in left center received 1 overall and 2 spot applications of MSMA and shows no St. Augustine grass. Row in right center received 1 overall and 2 spot applications of AMA and shows several St. Augustine plants. Details on this and in succeeding pictures will be found in Tables 1 and 2 on page 24 of the sod industry section.

Rows from Jean Tiff-St. Augustine plot. Row on the left had 1 over-all and 2 spot applications of MSMA. Shows no St. Augustine plants and about 70% regrowth of bermudagrass. Center row had 1 over-all and 2 spot applications of Calar. Shows several St. Augustine plants and approximately 70% regrowth. Right row is untreated control.

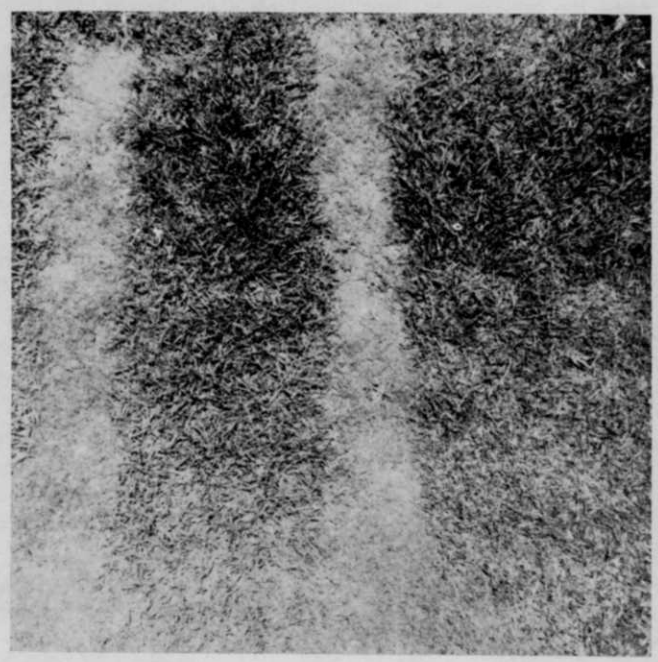

TABLE I. Number* of leaves of St. Augustine grass remaining 3 weeks after each application (numbers 50 and over are approximate)

CHEMICAL	DILUTION	TIFF GREEN-ST. AUGUSTINE PLOT			JEAN TIFF-ST. AUGUSTINE PLOT			COMMON BERMUDA-ST. AUGUSTINE PLOT	
		OVERALL APPLICATION	1ST SPOT APPLICATION	2ND SPOT APPLICATION	OVERALL APPLICATION	1ST SPOT APPLICATION	2ND SPOT APPLICATION	OVERALL APPLICATION	SPOT APPLICATION
MSMA	2 oz	200	36	0	100	16	0		0
MSMA	2 oz	400	200	0	500	16	0		
MSMA	4 oz	150	32	0	150	33	16(< actual)		0
MSMA	4 oz	100	50	0	150	0	0		
CALAR	2 oz	400	150	13	350	100	6(1 actual)		0
CALAR	2 oz	400	100	18	150	50	0		
CALAR	4 oz	350	100	42	200	34	0		0
CALAR	4 oz	400	100	0	250	45	0		
AMA	2 oz	600	450	150	600	50	0		42(14 actual)
AMA	2 oz	numerous	300	150	500	16	0		
AMA	4 oz	numerous	100	10	400	0	0		0
AMA	4 oz	numerous	100	0	850	50	0		

*corrected; a corrective factor was employed in each case to adjust actual counts because the volunteer St. Augustine grass was not uniform throughout any of the plots.

TABLE II. Approximate % regrowth* of bermudagrass varieties 2 months after 1st (overall) application of chemicals in the case of Tiff Green and Jean Tiff, and 1 month after 1st (overall) application in the case of common bermudagrass

CHEMICAL	DILUTION	TIFF GREEN-ST. AUGUSTINE PLOT	JEAN TIFF-ST. AUGUSTINE PLOT	COMMON BERMUDA-ST. AUGUSTINE PLOT
MSMA	2 oz	60	60	30
MSMA	2 oz	50	20	
MSMA	4 oz	40	30	10
MSMA	4 oz	30	40	
CALAR	2 oz	50	60	40
CALAR	2 oz	50	40	
CALAR	4 oz	70	80	40
CALAR	4 oz	60	30	
AMA	2 oz	70	80	30
AMA	2 oz	60	80	
AMA	4 oz	70	60	20
AMA	4 oz	70	50	

*corrected; a correction factor was employed in each case to adjust actual readings because the volunteer St. Augustine grass (and, thereby, the burmudagrass variety) was not uniform in any of the plots.

methylated arsenicals (Calar, AMA, and MSMA)* on volunteer St. Augustine grass. Three plots were set up at the turf nursery at Oso Beach Municipal Golf Course in Corpus Christi in March, 1967. One plot was composed of common bermudagrass (widely-used in this area for fairways), another of Tiff Green bermudagrass (widely-used in this area for tees and greens), and the last of Jean Tiff bermudagrass (formerly used for tees and greens). All plots contained much volunteer St. Augustine grass. Two different dilutions of each of the 3 chemicals were used and were applied along one-foot rows with a 2-gallon knapsack sprayer. The plots made up of Tiff Green bermuda-St. Augustine and Jean Tiff bermuda-St. Augustine each contained one replication of each treatment and 3 control rows. The common bermuda-St. Augustine plot was small and no replications were possible; there were 2 control rows.

The chemicals were applied in all cases to recently soaked turf approximately 2" high in sunny afternoons in mid-and late spring. Air and soil temperatures were measured before each application. The air temperature varied from 74° to 88°F. No temperature effects were noted or studied. The Tiff Green bermuda-St. Augustine and Jean Tiff bermuda-St. Augustine plots had 3 applications (one over-all and two spot treatments). The 1st spot treatment was made approximately 2 weeks after the over-all application, and the 2nd spot treatment was made approximately one month after the 1st spot treatment. The common bermudagrass-St. Augustine plot had only 2 applications (one over-all and one spot treatment), the spot treatment being made about 2 weeks after the over-all treatment. The rate of application of each material was 1 gal/150 square feet of turf or to the extent that the foliage was thoroughly soaked and dripping. The 2 dilutions employed were 2 oz./150 square feet and 4 oz./150 square feet. All plots were fertilized approximately 1 week after the first (over-all) application with Pro-Turf (5-2-0) Houactinite activated sludge fertilizer at the rate of 80 lbs./200 square feet of turf, using a fertilizer spreader for even application, and sprinkled thoroughly immediately. All plots were well cared for, but were mowed much less frequently than golf course turf customarily is.

Results of all tests are given in Tables 1 and 2. A summary of results shows that all 3 chemicals have a marked selective killing effect on St. Augustine grass. Each has a temporary burning effect on bermudagrass with MSMA causing the most burning, especially at the higher concentration. From these experiments MSMA at both dilutions in all but one case** seems to give 100% destruction of St. Augustine grass. Although severe burning of all 3 burmudagrass varieties occurred with MSMA

*Calar (or Super Dal-E-Rad) = 10.3% calcium acid methyl arsonate AMA (or Super Crab-E-Rad) = 8.0% octylammonium methyl arsonate plus 8.0% dodecylammonium methyl arsonate
MSMA (or Weed-E-Rad-W) = 35.33% monosodium acid methanearsonate (all products of Vineland Chemical Co., Vineland, New Jersey)

**As will be noted from Table 1, in one case (Jean Tiff) 2 leaves (one plant) remained after all 3 applications. It appears likely that this one plant was missed with the spray material.

at both dilutions (especially at 4 oz./150 square feet), complete and permanent killing did not occur. As will be noted from Table 2, in the rows treated with MSMA in the Tiff Green and Jean Tiff plots the burmudagrass had filled in on the average of 40% within 2 months. In the common bermudagrass plot it had filled in 20% in 1 month. In all test rows involving all 3 chemicals at both dilutions bermudagrass regrowth appeared healthy and apparently would soon cover 100%.

In all control rows both St. Augustine and bermudagrass grew abundantly and no disease or insect infestations were noted anywhere in the plots.

As can be seen further from Table 1, both Calar and AMA gave virtually 100% destruction of St. Augustine grass in the Jean Tiff and common bermudagrass plots, but did not do so in the Tiff Green plot. All plots were treated the same and were nearby, although not adjacent, so that environmental conditions from plot to plot were considered almost identical. Both Calar and AMA gave less burning of bermudagrass than did MSMA, and, as can be noted from Table 2, regrowth of bermudagrass was faster with these than in rows treated with MSMA.

Row from Jean Tiff-St. Augustine plot, showing results of 1 overall and 2 spot applications of Calar. One St. Augustine plant (with approximately 10 leaves) can be seen in the foreground.

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Turf Training Series
See Details
Page 11

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Meeting Dates

Arizona Agricultural Chemicals Association, Annual Meeting, Arizona Biltmore Hotel, Phoenix, Ariz., Oct. 12-13.

Industrial Weed Control Conference, Texas A&M University campus, College Station, Tex., Oct. 22-24.

New England Agricultural Chemical Conference, New Hampshire Highway Hotel, Concord, N.H., Oct. 24-25.

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

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

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

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

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

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

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

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

Illinois Turfgrass Conference, University of Illinois campus, Urbana, Ill., Dec. 7-8.

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

Northeastern Weed Control Conference, Hotel Commodore, New York, N. Y., Jan. 3-5.

Virginia Turfgrass Conference, Virginia Turfgrass Council and V.P.I., Golden Triangle Motel, Norfolk, Va., Jan. 23-24.

California Weed Conference, 20th Annual, El Rancho Hotel, Sacramento, Calif., Jan. 22-24.

Weed Society of America, 1968 Meeting, Jung Hotel, New Orleans, La., Feb. 6-8.

American Sod Producers Association, First Annual Meeting, In conjunction with Golf Course Superintendents Assn. Convention, San Francisco, Calif., Feb. 18-23.

ISTC Report

(from page 20)

whipped up by passing traffic. Because such problems do not fit the general pattern of pathogenic symptoms which plant pathologists and arborists normally seek, they are sometimes difficult to diagnose. Therefore, he urged arborists to keep records of weather, or at least the unusual weather conditions, of spray applications of pesticides and wood killers, of the use of wood preservatives on fences near shade trees, of the laying of gas or water lines, and the use of salt on roads near trees. Such records help since many times the non-pathogenic factor which caused the problem occurred earlier than the resulting damage. There is an answer to every tree problem, Professor Nichols said, if the clues are carefully sought out and used for diagnosis.

Woody Species Are Now Problems

Woody species which are resistant to the standard stem foliage spray of 2,4-D and 2,4,5-T have become problems on utility rights-of-way during the past few years. J. W. Kirch, Amchem Products, Inc., Ambler, Pa., discussed steps his company has taken to develop prescription vegetation control. Kirch said that with species susceptible to the standard stem sprays largely killed out, that resistant perennials such as milkweed, horsetail, and chickory, along with woody vines such as honeysuckle, kudzu and trumpetvine have taken over. Several new compounds, he said, have been found effective on these hard to kill species. Small amounts of the new compounds mixed with 2,4-D or 2,4,5-T will clear the right-of-way without substantially adding to the cost.

Cold hardiness in plants is a subject of great importance to the arborist, especially injury during the winter period. Dean R. Evert, horticultural graduate assistant at the University of Minnesota, St. Paul, Minn., reviewed physiological changes which occur as plants harden during the fall. Changes occur during a 2-stage process in the fall season. The first stage of cold hardiness begins in late summer, triggered by the decrease in day length. The second more intense stage comes with freezing temperatures. Spring growth then breaks the period of hardiness. Since little is known about winter injury, Evert reported that no strong recommendations can be made to guarantee freedom from winter injury. However, he did say that it is important to use materials which are known to be locally hardy. When this is not possible, Evert suggests selecting materials from a similar geographic area or from one which has a more severe climate. In all plants, he said, because energy is needed by the plant to harden, it is necessary to maintain a good level of food reserves during hardening. This means as much light as possible and adequate water. Finally, Evert said that the fertilizer program should be such that late fall growth is discouraged by keeping the levels of nitrogen and phosphorus low during hardening.

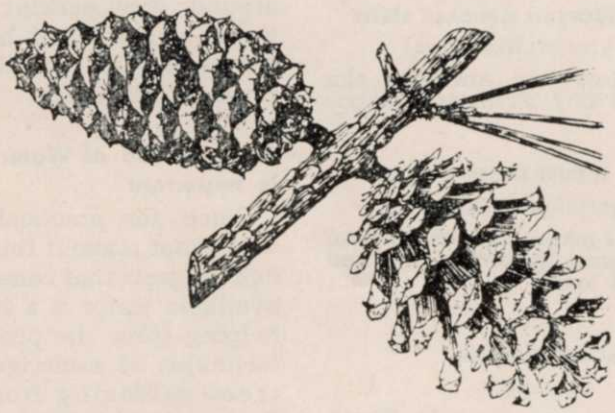
Dr. Philip L. Rusden, plant pathologist at Bartlett Tree Research Laboratories, Stamford, Conn., reports that his company has been expending considerable effort on drought effects. How this problem which has been common in eastern sections of the nation for the past several years can best be handled is of considerable economic importance to the industry. Drought can breed drought, Dr. Rusden said, the same as we can expect a series of wet seasons to breed wet seasons. Not only do the records prove these points, but meteorologists have established a scientific basis for this natural phenomenon.

To bring the problem into focus, Dr. Rusden reminded arborists that an acre inch of water weighs about 100 tons. An inch of water on one square mile amounts to about 65,000 tons. In an area such as the Northeastern U. S. where foliage normally enjoys an average rainfall of 44 inches per year, a drop in rain-

(continued on page 28)

SHORTLEAF PINE

(Pinus echinata)



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

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

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

Shortleaf pine, a member of the southern yellow pine group, is a medium-sized to large tree 80 to 100 feet in height and 2 to 3 feet in diameter. It is found on many sites, but mostly in pure or mixed stands on dry upland soils. Shortleaf pine is found in the Southeastern United States from Eastern Texas and Oklahoma to the Coast and north as far as Southern Pennsylvania. It does not grow in the Mississippi Valley region or in the peninsula of Florida.

Shortleaf pine, because of its remarkable ability to sprout after the main stem is destroyed, makes it the most difficult of all pines to control on eastern rights-of-way. In most instances the sprouts emerge from dormant buds located in the vicinity of the root collar, but when the aerial portion of the plant is totally destroyed, buds can arise on the short horizontal portion of the doubly curved tap root.

This pine may be distinguished from other southern yellow pines by its 3 to 6 inch long needles which generally appear two to a fascicle with occasionally three. Loblolly pine *(Pinus taeda)* generally has three needles per fascicle, occasionally two, and the needles are nearly twice as long as those of shortleaf pine. Pitch pine *(Pinus rigida)* needles are arranged in clusters of three. They are usually somewhat twisted and stand out at right angles to the twig. The angle of loblolly and shortleaf pine needles is more acute. Pitch pine often has tufts of needles produced in water sprouts along the trunk.

Shortleaf pine differs from Virginia pine (Pinus *virginiana)* which has short, twisted needes arranged two to a fascicle.

The twigs of shortleaf pine are reddish brown, stout, and very brittle as compared to other pines. The cones are 1 ½ to 2 ½ inches long and mature in two seasons. Mature cones are short stalked or sessile. Cone scales have slightly enlarged ends terminated by weak or deciduous prickles.

Shortleaf pine may be controlled by foliar sprays of 2,4-D/2,4,5-T providing at least 15 gallons of oil per 100 gallons water is added to the spray solution and thorough wetting is obtained. TCA (trichloroacetic acid) has been used, but the percent root kill is less than 50% unless a minimum of one hundred pounds per acre is sprayed.

Picloram at rates of one pound per 100 gallons of water has been very effective. Dicamba and 2,3,6-TBA at two pounds per 100 gallons water have also given good control.

The problem encountered with shortleaf pine is that in a right-of-way situation it is nearly always present with other conifer or hardwood species. Recently mixtures of picloram plus 2,4-D, and 2,3,6-TBA or dicamba with 2,4-D plus 2,4,5-T have given excellent root kill.

Aerial applications of 2,4-D and/or 2,4,5-T in mixture with picloram, dicamba or 2,3,6-TBA have been less effective than ground applications, largely due to the difficulty of obtaining good coverage with the low volumes normally applied by air. Thorough wetting with any material is necessary for good control of this species.

Insect Report

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

Turf Insects

FALL ARMYWORM

(Spodoptera frugiperda)

Georgia: Light on golf greens in Decatur County.

A FLEA BEETLE

(Chaetocnema sp.*)*

California: Adults heavy on dichondra lawns at Escondito, San Diego County.

A FALSE CHINCH BUG

(Nysius sp.*)*

Nevada: Heavy in yards, lots, and rangeland in southern Washoe County.

AN OLETHREUTID MOTH

(Bactra verutana chrysea)

California; Larvae and pupae heavy on 5 acres of nutgrass at Orland, Glenn County.

A SOD WEBWORM

(Crambus sp.*)*

Oklahoma: Heavy on lawns in Altus, Jackson County.

Insects of Ornamentals

AZALEA CATERPILLAR

(Datana major)

Georgia: Heavy on azaleas in Camden and Clarke Counties.

AZALEA LEAF MINER

(Gracillaria azaleella)

California: Heavy on azalea plants in Danville, Contra Costa County.

TEA SCALE

(Fiorinia theae)

Florida: All stages moderate on 50 percent of 200 camellias and 80 percent of 100 Burford holly plants at nursery in Longwood, Seminole County.

WHITE PEACH SCALE

(Pseudaulacaspis pentagona)

Florida: Moderate on stems of 87 nursery plants of golden raintree *(Koelreuteria* sp.*)* at Lake Helen, Volusia County.

AZALEA WHITEFLY

(Pealius azaleae)

Ohio: Moderate to heavy on 8,000 plants in Lake County.

Tree Insects

ELM LEAF BEETLE

(Pyrrhalta luteola)

California: Eggs and larvae heavy on elm in San Jacinto, Riverside County. This is a new county record. Adults heavy on cottonwood in Twain Harte, Tuolumne County. Heaviest in State for past several years. **Nevada:** Damage very heavy to elms in Caliente, Lincoln County. **Utah:** Damage heavy to elm foliage in Fillmore area, Millard County. This is a new county record. **New Mexico:** Heavy on elms in Roswell, Chaves County. This is a new county record.

SMALLER EUROPEAN ELM BARK BEETLE

(Scolytus multistriatus)

Colorado: Heavy on American elm near Canon City, Fremont County.

LOCUST BORER

(Megacyllene robiniae)

Ohio: Larval mining serious problem on black locust in southeastern and east-central areas.

ENGRAVER BEETLES

(Ips spp.*)*

Georgia: Heavy on pines in Worth and Tift Counties.

BOXELDER LEAF ROLLER

(Gracillaria negundella)

California: Severe on boxelder in Alturas, Modoc County; browning widespread.

COMSTOCK MEALYBUG

(Pseudococcus comstocki)

California: Heavy on fruitless mulberry trees *(Morus sp.)* Delimiting survey shows many mulberry trees and very few catalpa trees infested. Mulberry severely damaged.

NANTUCKET PINE TIP MOTH

(Rhyacionia frustrana)

Oklahoma: Damage heavy in ornamental pine plantings in Mayes County.

FALL WEBWORM

(Hyphantria cunea)

Wisconsin: Heavier than normal in State; many half-grown and some full-grown larvae. Webs larger than usual. **Iowa:** Heavy on elm, ash, and walnut in southeast area: up to 5 webs on some trees. **New Mexico:** Heavy on shade trees at Fort Stanton, Lincoln County; ranged 10-20 webs per tree on walnut.

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

ISTC Report

(from page 26)

fall shows the tremendous pressure placed on large trees. A lack of one inch of water can add up to a serious threat in a very short time. Man, Dr. Rusden said, appears to be somewhat guilty of accentuating drought by paving, draining land, and just walking around. New parking lots, highways, airports and housing developments all contribute to the pressure of foliage.

Conservation of Water Is Important

Since, for practical purposes, we cannot make it rain, Dr. Rusden suggests that conservation of available water is a step toward helping solve the problem. The technique of subirrigation helps trees suffering from drought. Such irrigation helps by putting water into the soil, especially when nutrients in solution are added, by aerating the soil, and by breaking up compacted soils.

Surface watering is also helpful where a source of local water is available. Mulches are familiar and help greatly by holding water loss by evaporation to a minimum and in keeping soil in the root zone cooler and more moist. Anti-dessicants or anti-transpirants in the form of plastic or wax preparations also help reduce water loss. Dr. Rusden also mentioned the use of mechanical bariers to protect plants from sun, especially during moving. Pruning can also help a drought stricken tree, Dr. Rusden said. A small root system cannot support a large crown. Thus reduction of the crown relieves pressure on the roots to supply moisture. He related that at the Bartlett Tree Research Laboratory that some trees were pruned over a 30-year period. Trees that normally would have been 40 feet in height were kept to about 12 feet. Dr. Rusden implied that more water short years are in sight and called for additional research on the problem.

Root systems of deciduous trees are quite different than most people believe, according to

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Classifieds

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

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

FOR SALE

1955 HALE CENTRIFUGAL, 60-gal./ min., 600-lb. sprayer, with approximately 200 ft. of ¾" and ½" hose and 2 guns. Brouse Bros. Nursery, Potshop Rd., R.D. 1, Norristown, Pa. 19401. Phone 275-5682.

HELP WANTED

FORESTER. B.Sc. 1963. Single, age 27. Military obligation fulfilled. Seeks position in right-of-way maintenance utilizing chemical brush control and total vegetation control experience. Résumé and references on request. Write Box 28, Weeds Trees and Turf magazine.

Head Greenskeeper—City of San Jose. $7,848-$9,552. Position involves supervision of construction, care and maintenance of Municipal Golf Course. High school graduation, plus 5 years' experience in golf course maintenance, including one year in a supervisory capacity. Apply Room 211, City Hall, 801 N. First St., San Jose, Calif. 95110. An Equal Opportunity Employer.

PARK MAINTENANCE MANAGER, Fairmount Park Commission, City of Philadelphia, Salary $10,175-$12,691. Administrative divisional head position, under general supervision of Park Director in large diversified city-wide park system of seven thousand acres. Involves planning and directing maintenance services for grounds (parkways, fountains, drives, streams and river frontage, squares); buildings (including historic homes and museums); and recreation facilities (five golf courses, swimming pools, nine day camps). The manager is responsible for supervising specialized subordinates who direct a large trades force and related personnel. Some budgetary knowledge necessary. Applicant should possess a college degree with major course in park management, horticulture architecture or a related field, and three years of experience in management or supervision of the maintenance and upkeep of a large park system, including a variety of park facilities and buildings. Additional experience in lieu of the required years of education will be considered. Forward applications to: Andrew Dehel, Personnel Officer, Fairmount Park Commission, Belmont Office, West River Drive, Philadelphia 31, Pennsylvania.

ISTC Report

(from page 28)

Dr. Benjamin B. Stout, of the department of horticulture and forestry, Rutgers State University, New Brunswick, N. J. Dr. Stout exploded two common myths which people believe about trees. First is the dumbbell concept of shape. Most people, he said, conceive of the tree as having comparable sized crown and root systems which are about the same shape. These form the bells, and the trunk forms the handle. Beyond the seedling stage, there is little evidence to support this, he said. The second myth is that every tree has a taproot. Such is not the case, according to Dr. Stout. In his studies at Harvard Black Rock Forest, Cornwall, N. Y., he found that rooting systems vary greatly between species and within the species itself. The root system largely depends on the site where the tree is growing.

Generally, Dr. Stout said, the lateral spread of the root system is greater than the spread of the tree crown. Crown spread is usually less than tree height, which is less than root length. Further, the direction of root spread is not predictable. It may be evenly distributed around the trunk but is more likely to spread toward the more favorable moisture supply.

Grafting of roots between trees depends largely on density of roots within a species, nearness to base of the tree, and depth of soil. For example, Dr. Stout reported on 2 white oaks growing only 4 feet apart. More than 20 root grafts were counted. But 5 feet beyond the base of these trees no grafts were found. Roots from nearby trees of other species did not graft with the white oaks even though their roots grew through the white oak systems.

Of 25 trees in one study, Dr. Stout found that the lateral spread of the root systems averaged 4½ times the crown spread. He believes that rooting habits, both depth and lateral, are related to species and site. Generally, he said, rooting depth proved to be quite shallow, usually 4 feet or less with roots concentrated in the upper one foot or so of soil. Because of this relationship and balance, Dr. Stout speculated that shade trees planted along streets frequently sit for years before making any significant growth. Both crowns and root systems have been severely pruned and are presumably in balance. But the large vascular system probably requires almost all the energy captured in photosynthesis for maintenance. Little is left for growth. Thus, Dr. Stout suggested that a tree needs to be balanced in 3 parts, rather than 2, the 3 being transpirational surface, vascular system, and the root system extent.

At the combination conference of ISTC members and National Arborist Association members, staged Aug. 27-Sept. 1, more than 795 persons registered. This figure included exhibitors and guests in addition to members of the two organizations.

ISTC members of the Board of Governors elected Freeman L. Parr, Parr and Hanson, Inc., Hicksville, N. Y. as president to succeed outgoing President Richard J. Campana, University of Maine, Orono, Me. Parr who last year was vice-president and normally would have moved into the president-elect position was elected president by virtue of the resignation of the 1966 president elect, C. Elmer Lee, Southern California Edison Co., Los Angeles, Calif. Keith L. Davey, president of Keith L. Davey Tree Surgery Co., Limited, San Francisco, Calif. was named president elect. Richard E. Abbott, Ohio

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Power Co., Canton, O., was elected vice-president. Succeeding Davey on the board of governors for the Western Chapter was Jack R. Rogers, Los Angeles.

Among meeting invitations tendered for coming ISTC conferences was one extended by Davey for 1969 to Portland, Ore., and one to Long Beach, Calif., for 1972, to be held on the Queen Mary which has just been purchased by that city. Invitations were also extended to the group to meet at Miami, Fla., and at Montreal, Canada. The 1968 session will be held August 11-16 at Chicago, Ill., with headquarters at the Pick-Congress Hotel.

The National Arborists elected Kenneth P. Soergel, of Kenneth P. Soergel Arborists, Gibsonia, Pa., as president. He succeeds past president Harry A. Morrison, Wilmette, Ill. Edward C. Shearer, Farrens Tree Surgeons, Inc., Jacksonville, Fla., was named 1st vice-president; Paul R. Walgren, Jr., Walgren Tree Experts Inc., Hamden, Conn., 2nd vice-president; William A. Rae, Frost & Higgins, Arlington, Mass., secretary; and William P. Lanphear, Forest City Tree Protection Co., Cleveland, O., treasurer. Hyland R. Johns, Asplundh Tree Expert Co., Jenkintown, Pa., was named to the NAA board.

Awards presented by the ISTC were as follows: Author's Citations, Dr. Spencer Davis, Rutgers University, N. Y. and Dr. Curtis May, USDA, both for sustained publishing of research in shade tree and ornamental plant pathology; Awards of Merit, Mrs. L. B. Johnson, Washington, D. C., for initiative, leadership and influence in developing the National Beautification Program, and to the Honorable Harold E. Hughes, governor of Iowa, for leadership and support of research in Dutch elm disease and development of the Elm Research Institute; Honorary life memberships, Max Watson, San Jose, Calif., E. A. Sanford, Freeport, O., and R. J. Campana, Orono, Me.; Past president's plaque was awarded outgoing President R. J. Campana; Special award made "only every 30 years" according to Dr. Campana who made presentation to Dr. and Mrs. L. C. Chadwick "in grateful appreciation for 30 years of dedicated service to ISTC, 1937-1967;" and a portable TV set for tree identification contest, Herman Porter, Bartlett Tree Expert Co., N.J.

The NAA awarded honorary memberships to Paul Tilford, Wooster, O., and to Russell Whitten, Delaware, O. Safety awards went to Blume System Tree Experts, Houston, Tex., accepted by Lynn Partee, for Class I (100 employes or more), and to Irish Co., Inc., Warren, Mich., accepted by Ed Irish, for Class II (25-100 employes). This was the 7th consecutive year the award has been made to Blume and the 4th year to Irish.

Ortho Paraquat Now OK for Non-Crop Use

Paraquat, a liquid contact herbicide, now has federal registration for use on noncrop areas such as roadsides, highway margins, or around buildings and commercial facilities, its developers, Ortho Division, Chevron Chemical Co., report.

Paraquat controls a variety of annual weeds including Burclover, Chickweed, Filaree, Groundsel, Knotweed, Lambsquarters, Mallow, Nettle, Pigweed, Plantain, Puncturevine, Purslane, Red Clover, Shepherdspurse, Thistle, Wild Mustard, Wild Radish, Wild Oats, Bluegrass, Cheatgrass, and Crabgrass. It also is effective for suppression of perennial weeds such as Bermudagrass, Johnsongrass, and Morning-glory, Ortho claims.

Recommendations are to apply 1 to 2 qts. per acre (50 to 100 gals. dilute spray per acre.) The product is said to be most effective on succulent young weeds and grasses. It is reported to be completely water-soluble, nonvolatile, nonexplosive, and nonflammable in aqueous solution.

More information on Paraquat is available from Ortho Division, Chevron Chemical Co., 7524-42 Hickman Rd., Des Moines, Iowa 50303.

Trimmings

Early Sod Producer. Charley Capozello, longtime sod producer at Capozello Turf Farms, Hightstown, N. J., says he may retire next year. Charley told us his father was one of the earliest sod producers in the nation, having started in business shortly after the turn of the century. We found sod producers in this area happy with the 1967 rainy season, after suffering with drought last year.

* * *

Fairmount Park Is Unique. *We enjoyed a visit last month with Harold Schick, director of Fairmount Park, a 4000-acre complex in the heart of Metropolitan Philadelphia. Schick who hosted the ISTC and NAA members during the recent Conference field demonstration is making great strides in maintaining and upgrading Philadelphia's already impressive arboriculture program. Schick asked for 10 copies each month of WEEDS TREES AND TURF magazine. He reports his supervisor and foremen constantly have to improve their knowledge of new technical methods.*

* * *

South Dakota Growers Form Association. South Dakota bluegrass seed has been harvested and processing is well underway. We learned in a conversation with C. J. Wilber that a group of producers have formed the South Dakota Kentucky Bluegrass Association. Wilber is serving as secretary-treasurer. Headquarters for the group is P.O. Box 823, Huron.

* * *

Plaudits To Michalko. *John G. Michalko, Cleveland, O., commissioner of shade trees believes a city should take the lead in civic beautification. His record bears out this thinking. Cleveland regularly plants 4000 trees each year. Michalko says that during his 37 years with the City, more than 150,000 trees have been established for the public. He started as a tree trimmer with the city in 1929, later becoming assistant horticulturist and then commissioner.*

* * *

Bartlett To Study Capitol Trees. The F. A. Bartlett Tree Expert Company of Stamford, Conn., has been hired as the consulting agency to study the 300,000 street trees in Washington, D. C. During the coming year, Bartlett will determine the status of the Capitol tree population, recommend any remedial programs needed, and map procedures for future programs.

* * *

Landscape Contractors "Cleared." Michigan landscape contractors are smiling again. Big death losses along highways of Pinus Strobus, Malus and Cratabus had them puzzled. Investigation showed losses last winter due to rabbits and salt. Michigan's big snowfall shut off the normal food supply of the rabbits and they turned to the bark of roadside plantings. Salt spray whipped up by traffic also helped kill those plantings within the salt pattern of the highway. Henceforth, the highway department will drop these more susceptible species from specifications.