times of the year. If severe, all blades and stems are killed, but in most cases, some blades and stems go unharmed. Infested blades of the grass usually remain upright but become brown in a water-soaked appearance.

**Dollarspot.** Diseased areas are usually bleached spots two to three inches in diameter. Lesions can be seen on the leaves of the grass surrounding the bleached spot. The spots may coalesce into larger areas. Dollarspot seems to be most prevalent on zoysiagrass and bermudagrass.

**Pythium.** Pythium primarily attacks bermudagrass. The affected areas are usually in streaks with the individual blades matted together and slimy in appearance. White cottony growth may also be seen on the blade.

**Helminthosporium.** The disease is characterized by an overall thinning of the turf. Lesions on the leaf are purplish to brown. In severe cases the leaves will wilt and die and the sheath may rot. Helminthosporium affects primarily bermudagrass.

**Gray leafspot.** Gray leafspot primarily attacks st. augustinegrass. Lesions occur on the leaves and may be found on the stems. These lesions are oblong with an ash center and a purpure to brown margin. The disease is most prevalent during hot, rainy weather. In severe cases the area may have a scorched appearance.

**Nematode.** Damage is characterized by a slow decline in the turf, a restricted root system and a general thinning of the area. Because the roots are affected, these areas usually become yellowish and wilt easily.

### Diagnostic Tools Used in Analyzing Lawn Problems

**Soil tube.** A soil tube can be used to take soil samples for making comparisons between good and bad areas in the lawn. Such comparisons may include the effective root depth, the condition of the roots, and the moisture content of the soil. Samples also can indicate compaction, layering, or the presence of mat or buried materials. The tube also can be used to take soil samples to determine the nutritional level and pH of the soil, or for nematode analysis. Soil tubes may be purchased from many garden supply stores.

**Hand lens.** A hand lens is useful for magnifying insects, disease lesions, and nutritional deficiencies. It is handy for examining roots for nematodes and looking at soil particles.

**Metal can.** A metal can with the bottom and top cut out is the best tool to use in determining the presence of chinch bugs in a lawn. The can is pressed into the soil and water is added. Chinch bugs then float to the top.

**Patch test.** The patch test can be used to verify the presence of nematodes, insects, and certain nutritional deficiencies. For example, if nematodes are suspected, a very small area can be treated with a nematocide. If the area responds to the treatment, this is a good indication that nematodes are the problem. If worms are thought to be present, an area can be tested with BHC or pyrethrins to bring them to the surface. If a nutritional deficiency seems to be the trouble, small areas can be checked with individual fertilizer nutrients, such as nitrogen or iron. If there is a response to the treatment, your diagnosis is probably correct.
them are servicemen involved in weed control. Six of the 13 are seasonal help in weed control. Smith says he tries to get the same six men each season. He feels it's possible when men are chosen carefully. Smith presently has a good arrangement with a retired 45-year-old policeman, who goes to Florida in the winter and works for Azo in the summer. There are four regular pest control servicemen, who double in weed control when needed, and three of what Smith calls "key carryover men," the nucleus of his service force. One of these has been with Azo for seven years.

Smith's attorney, Ed Zink, also serves as corporate secretary. Azo also employs a regular secretary who doubles as bookkeeper.

Weed control men cover the entire state of Ohio and have routes like those of traveling salesmen. They often leave Monday and do not return until the following Saturday. Such trips involve one man per truck.

How Azo Sells Services

Azo uses direct mail advertising extensively. A personal letter directed to a maintenance supervisor, along with a business reply card, invites him to ask for an inspection and an estimate.

"This direct mail method has been fairly successful," says Smith, "because weeds are eye-catchers. Since everybody with real estate has them, no one can say they don't have to control weeds."

When asked whether Azo uses salesmen, Smith replied, "We have experimented with salesmen. One winter, a key carryover man called on various businesses 'cold,' and landed a respectable number of contracts. This was fairly successful, but we feel that direct mail, for us, is more productive, per dollar spent.

"We push direct mail campaigns in the fall when weeds are highest, so maintenance managers can see, when they read our sales piece, exactly what we're talking about. Also, we have a push in the spring, when the feeling of plant pride is high, you know, that 'clean up, paint up, fix up' feeling," the CA explained.

Radio Ads Swamp Business

"Besides direct mail, what other kind of selling have you done?" we asked.

"We experimented with radio ads a few years ago to drum up business for local residential lawn weed control. We broadcasted one-minute spot announcements, consisting of a singing jingle. The punch line ended with 'She knows where the yellow went; she called Azo.' Of course, the 'yellow' is a yard full of dandelions which everybody tries to get rid of. Anyway, we were so swamped with calls for service we couldn't possibly handle, we had to stop running the ads," Smith replies with only a slight tone of lament.

"At present we are not cultivating residential accounts, because we're so busy with industrial business. We're not prepared to expand temporarily for the seasonal spurt of lawn weeds; it would be better to offer complete lawn service which we don't want to do now," he adds.

For the limited residential weed work Azo does, the men use a Hardie Town & Country spray rig mounted on a Jeep. It has a 25-gallon capacity and pumps out spray at a low pressure (250 psi). They can apply either 2,4-D water-soluble amine—the nonvolatile type—(4 lbs. per gallon), or chlordane for crabgrass and turf insect control. On a chlordane job, a separate Town & Country sprayer is used because of the danger of 2,4-D carryover in the spray. If customers wish, Smith will fer-
This hat does things for you

It represents the forest fire prevention campaign serving every American business that depends on wood or wood products—your business, very likely. It's been pretty successful, too. Since this campaign began in 1942, there have been over 272 million acres that did not burn, more than 1 million fires that did not happen, and 10.1 billion dollars worth of damage that did not occur. But Smokey's job will never end, and he needs your help. You can wear that hat, too, by urging your employees and the people in the communities in which you do business to be extra careful with fire—every fire.

remember-only you can prevent forest fires

Material for posting on your bulletin board available from your State Conservation Department or the nearest office of the U. S. Forest Service.

Published as a public service in cooperation with the U. S. Forest Service and The Advertising Council

WEEDS TREES AND TURF, May, 1965
trucks are put to, saving equipment money.

A rule which Smith insists all his men follow is: “Obey the rules of the company in which you’re working.” Since many contracts involve steel plants, which have elaborate safety precautions, Smith provides the necessary brightly colored safety vests, hard hats, and goggles his men need to comply with all regulations of plants in which they work. Vehicle speed rules inside plants must be obeyed also. “After all,” Smith says, “we are indirect employees there.”

The Azo men wear company-issued clothing which they maintain themselves. The shirts have the company name over one pocket and the man’s name over the other. Also supplied are chemical-resistant, plastic-coated gloves for the men when they work with herbicides.

Who Are Smith’s Servicemen?

“We do not actively recruit weed control servicemen,” Smith remarks. “Usually there are enough calling us so we can pick and choose. Since there are very few men with any experience in weed control, we find we get along well by training our own. We attend winter short courses and hold regular meetings in the shop where we hash over problems which have come up through the summer. We get these straightened out by springtime.

“I have never hired a man who has more than a high school education, although high school is not an imperative requirement for a job here. I think the man’s personality and desire to learn and work is very important. Experience has shown me that his personal appearance is probably one of the best indicators of a man’s worth,” Smith reveals. “This is what I have been paying attention to recently. His appearance will tell me whether I want to talk further with him.”

Azo’s men are paid on an hourly rate. Smith feels that this gives men more incentive to go ahead and finish a job if he has to, rather than knock off at “quitting time” and go back to finish later. “We avoid ‘gold-bricking’ by setting quotas which the men should be able to meet,” he says.

Spray can be diverted from the cab valve by turning a gate valve near the pump which will then deliver spray to a hose and on to a hand or orchard spray gun.

Smith chooses a Hardie Model 99 sprayer for off-center spray work. It has 100-gal. capacity tank. The piston pump is powered by a 4-hp Briggs and Stratton gasoline engine. The pump develops up to 400 psi. Telvar is the soil sterilant of choice for jobs such as the drive-in theater.

The railroad power handcar, mentioned at the beginning, is another Smith innovation. His custom, steel-wheeled railroad trailer carries a Hudson Peerless 100-gallon power sprayer which tags along behind the power handcar on which two men ride. The sprayer has attachments for either boom or gun application of soil sterilant to railroad ballast.

For highway transit, both the power car and railroad trailer are towed behind a pickup truck on a balanced two-wheel trailer. When the two-wheel trailer is pushed onto a grade crossing, it can be tilted so the railroad treating rig can be winched up the ramp. The railroad wheels are chained to the highway trailer to keep the treating unit in place. Two men can easily level the loaded trailer because it is balanced, and maneuver it to the trailer hitch on the pickup truck.

Calibrate Sprayers, Not Men

“There are some men who can never spray lawns, because their treating speed is too erratic, or they can’t maintain a steady pace through all their jobs,” Smith claims. So he has painted a 1,000-sq.-ft. area on the bricks in the parking lot in front of the office where he tests a man’s lawn treating ability.

“Instead of trying to make the men conform to a working speed of a machine, we calibrate the...
machines to the men. When we find a man's steady speed, where he will not tire or slow down at the end of the day, we set the dilution rate for the chemical, then measure how much liquid he takes from the tank. This way we can fairly accurately measure and apply at the same time,” the Canton CA details.

Smith says his calibration is \( \frac{3}{4} \) inch of liquid for 1,000 sq. ft. That is, he will lower the liquid level of a Town & Country sprayer \( \frac{3}{4} \) inch when he treats 1,000 sq. ft. “So I have to make my dilution accordingly to apply the proper percentage of 2,4-D in that \( \frac{3}{4} \) inch of chemical dispensed. Each man has his own sprayer that he always uses; we don't switch men or sprayers. If we get a man who can't maintain a steady pace at any level, we find another job for him to do; if he's good at that, okay; if not, he goes,” Smith admits.

Smith finds a Rolatape, Model 400, foot measurer an indispensable aid for measuring both square and linear footage on jobs. Footage is as important on residential work as it is for treating railroad track. This is how Smith makes estimates.

A length of fire hose is a handy aid to have along on industrial weed jobs, he found. Smith points out that most industrial plants have their own private fire-hydrant systems. Azo gets permission to fill up from these. The fire hose will load a 100-gal. tank quickly and save time on the job.

"Each man on an industrial job, when he has to refill his tank, will have a premeasured amount of weedkiller in a labeled plastic jug. This will be just enough to make the right concentration in 100 gallons of water. The jugs save space and are easier to handle than large drums of concentrate. There is also less danger of spillage and waste,” Smith tells us.

"Where can this industry go; what do you see as the future of weed control?" we asked.

"You see those small businesses;" he pointed to several concrete block buildings along the highway, “their lots are pretty weedy, and there's no one around to service them. Yes, I've got myself into some large businesses like steel mills and the like. My operations aren't geared for small accounts. An aggressive seller and a good workman could offer weed control to these small businesses and make a good living. The jobs are there for the asking; your 'salesmen,' the weeds, are as plain as the nose on your face, and they're standing right outside your customers' doors."

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Greenfield Prints Brochure

A new brochure which describes technical assistance and gives detailed information on products for turf production and maintenance, has been recently made available by Greenfield Research Center.

For a copy of Greenfield’s Commercial Landscaping Plan, write to Elanco Products Co., Box 1750, Dept. WT, Indianapolis 6, Ind.

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To dispose of drums: return them to the formulator, sell them to a cooperage equipped to decontaminate them, or destroy them according to procedures recommended by the U.S.D.A.

Play it safe and you do a great deal to ensure the efficient and profitable performance of any pesticide.

National Agricultural Chemicals Association
A new, one-piece, 200-gallon spray tank said to be virtually indestructible has been introduced by the Century Engineering Corp. Named the Poly No. PT-200, the tank weighs one-third less than steel tanks of same size and will handle all kinds of chemicals. More details can be obtained from Century Engineering Corp., Cedar Rapids, Iowa, 52401.

Sevin Is Subject of Folder
An illustrated folder discussing application of Sevin carbaryl insecticide for insect control on turf, trees, and grounds was recently released by the Olefins Div., Union Carbide Corp.

The folder explains why Sevin provides an answer to insecticide drift and residue problems encountered by custom spray operators, park superintendents, and municipal authorities.

Copies of the folder may be obtained from Olefins Division of Union Carbide Corp., 270 Park Ave., New York, N. Y. 10017, by requesting booklet F-4198.

Green Lawn Testing Service
New for Turf Managers
Availability of professional soil testing for turf managers has been announced by Green Lawn Laboratories of Skokie, Ill.

Designed for turf maintenance companies, parks, golf courses, industrial grounds, and similar installations, the tests include recommendations of specific fertilizer or pesticide procedures, or other practices to help improve problem turf areas. Green Lawn agronomists will test soil and plant samples for a fee and recommend action based on test results, according to Green Lawn's Donald Arenberg.

A supplementary service offered turf professionals is the custom formulation of fertilizers and pesticides to fit specific needs as determined by tests.

More information is available from Green Lawn Laboratories, 4944 Main St., Skokie, Ill.

New Ansul Plant Attains Capacity Production
A new chemical plant, capable of producing 20,000,000 pounds of weed-killing organic arsenicals a year, is now operating at capacity, Robert C. Hood, president of The Ansul Co., Marinette, Wis., announced recently.

The new $750,000 plant began production about March 1, and is expected to operate at capacity until the end of the selling season late this summer, Hood said.

Plant product is monosodium methanearsonate (MSMA) in a variety of forms, and sold under the name of Ansar-170. The company reports it to be particularly successful in the control of johnsongrass and other weeds in the cotton fields of California and southern cotton states, without sterilizing the soil or damaging crops.

Daxtron Is New Dow Herbicide
Discovery of a new, highly active weed and grass killer described as a systemic herbicide with potential applications for both industrial and agricultural uses has been announced by The Dow Chemical Co., Midland, Mich. The new product has been trademarked Daxtron.

Dr. E. R. Laning, of the Dow field research station, Davis, Calif., said further research and development is needed to fully define the material's potentials.

Laning said work to date has indicated that Daxtron is especially effective for the control of grasses, although johnsongrass appears a tolerant problem species.

Daxtron is absorbed in phytotoxic amounts by both roots and foliage. Dow research indicates that the material has a moderately long residual life in soil but is subject to moderate leaching in coarse-textured soils under high-rainfall conditions.

Extensive toxicological testing indicates that application at rates used for vegetation control pose no hazard if simple precautions are taken to prevent ingestion and prolonged exposure to spray mist.
You need as little as four to eight gallons of Tritac to treat an entire acre for a season or more.

This powerful liquid herbicide sinks deep into root zones to control bindweed and other problem perennial growths such as Russian knapweed, Canada thistle and bur ragweed. Use it along fence rows, roadways, bridge abutments, on industrial sites and other noncrop land.

Tritac is not corrosive to standard equipment. It is safe to handle, as its toxicity towards mammals is low.

Choose from three. Tritac is the basic formulation. Tritac-D obtains quicker foliage top kill. Tritac-10G is a granular formulation.

Liquid Tritac is available in cartons of six 1-gal. cans; also in 5-gal. cans and 30-gal. drums. Granular Tritac is packed in 25-lb. bags.

For more information, please write Agricultural Chemicals, Hooker Chemical Corporation, 405 Buffalo Avenue, Niagara Falls, N. Y. 14302.
**Know Your Species**

**OXEYE DAISY**
*(Chrysanthemum leucanthemum)*

Oxeye daisy is a perennial which reproduces by seeds and by sprouting of a short rootstock (E) or rhizome. It is otherwise known as a white daisy, white weed, field daisy, and the poorland flower. It is found in meadows, pastures, old fields, waste places, and lawns; it seems to thrive in soil of low fertility where competition is weakened.

Stems are erect and smooth, branching more in the upper portions (A). Stems may reach 3 feet high. Each stem bears only one composite flower head.

Leaves are alternate and lobed, especially the basal leaves which are more broad than long. Near the top, leaves are more lance-shaped, but they still are somewhat scalloped. All leaves are fuzzy.

Flowers resemble other daisies. The inner cone of disc flowers is yellow, each small flower (C) has a single petal. The sterile ray flowers (B) around the outer edge are white. Each small flower within the head bears one seed (D). It is oval and curved. One side is nearly straight and the other convex. There is a knot or tubercle where the flower parts were attached to the seed. The seed is black with several gray or white ribs or ridges.

If oxeye daisy becomes established, it can be a serious weed problem, because it can spread by underground rootstocks. Vigorous, well-fertilized turf can crowd this weed out. Sometimes the plant will have a somewhat horizontal growth when mowed in turf. If grasses are weak, the broad daisy leaves smother surrounding grasses. It manages to bear flowers and seeds even in this flattened condition. It is said to be moderately tolerant to most herbicides at standard strengths. Apply treatments of 2,4,5-T and 2,4-D at the highest rates recommended for perennial weeds when the weeds are in the early bud stage and while plants are actively growing. Treatments repeated annually will reduce stands.

Spot treatments with arsenicals or ammonium sulfamate will kill the daisies, but treaters are advised to restrict these materials to the daisies, since contact with grasses will kill them, too.

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)
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Highway Vegetation Control
Seen as Construction Trend

Growing use of vegetation control contractors and greater emphasis in planning and construction of roads from the standpoint of low maintenance costs for vegetation control, were highlighting statements at a recent meeting of the American Road Builders Association. Predicting these important developments for the vegetation control industry were Clyde A. Bryant and Bernard P. Thomas, Dow Chemical Co. specialists, as they addressed the meeting held in Washington recently.

They went on to forecast that mowings would be reduced by more than half because in the next 10 years effective growth retardants will be on the market. More attention to choice of desirable plantings is expected.

Bryant and Thomas said new technology promises significant achievements in safety, beauty and economy of roadside landscaping. Progress in roadside vegetation control in recent years has been “modest for a number of reasons including the fact that we have had to teach ourselves the technology involved with this new tool.”

They did add that “almost unlimited capabilities” exist today to create or to tailor products and techniques for vegetation control “if we understand your needs.”

Probably the most significant concept that will lead to future growth is programming, they said.

“Today we seldom see the individual who wants to sell or the customer who wants to buy a one-chemical, one-treatment, one-year approach; rather, we see on an orderly basis three- to five-year programs coming into being. Within these programs, one or several chemicals may be utilized depending upon the climatic factors, the vegetation problems, the needs and desires of the engineer.”

Already in wide-scale usage, they said, are these methods:

- Removing broadleaved weeds from desirable grassy areas,
- Complete vegetation control around guardrails, signs, delineators, culverts, bridge abutments, rural mailboxes, and parking, maintenance, etc.
- Selective crabgrass control in medians, roadside edges, rest areas, and parks.
- Grass and weed control in the expansion joints, transition strips, passing lanes, and roadside edges on macadam roads.

A DIVISION OF
UNIVERSAL AMERICAN CORPORATION

Aircraft pilots engaged in agricultural spraying operations in 12 northeastern states converged upon Cornell University, Ithaca, N.Y., to attend the first conference ever held for aerial spraymen, March 23-24. Of the 76 pilots and college specialists attending the meeting, five were found inspecting one of the specially equipped planes displayed at Tompkins County airport. They are Prof. George B. MacCollom, University of Vermont; Prof. A. A. Muka, Cornell University; Prof. Roy A. Kriner, Rutgers University; Alton E. Robinson, pilot from Accord; and Terrell P. Kirk, Jr., Elmira, test pilot of agricultural airplanes for Grumman Aircraft Engineering Corp.

WEEDS TREES AND TURF, May, 1963