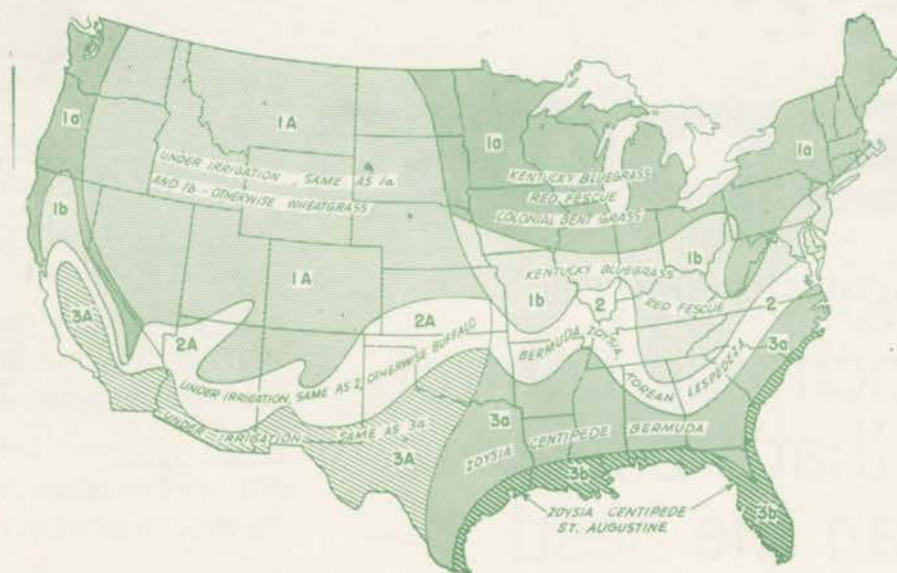


WEEDS and TURF

APRIL
1964

The grass-roots magazine of vegetation maintenance©

Area Guide for Easy Turf Maintenance



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The Hemlock Looper . . . 12

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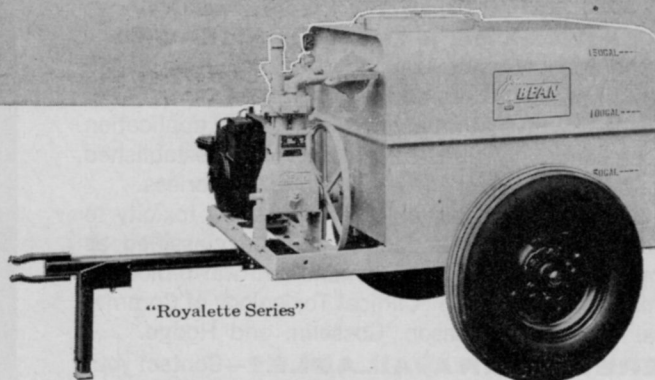
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WEEDS and TURF

April 1964

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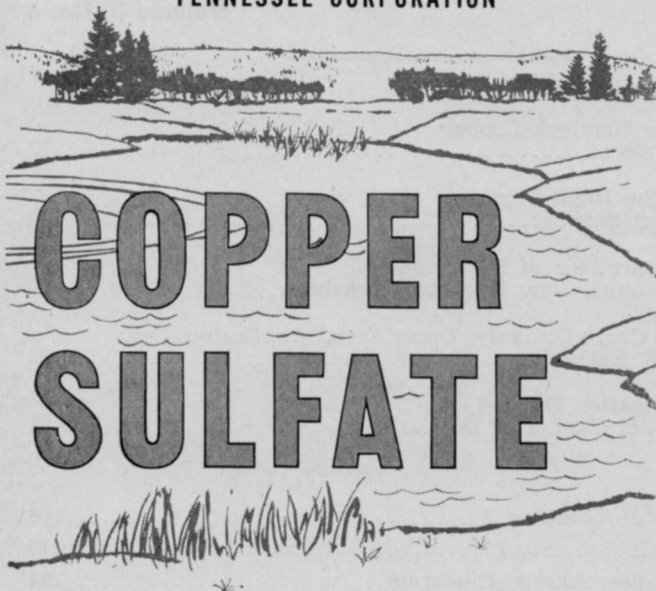
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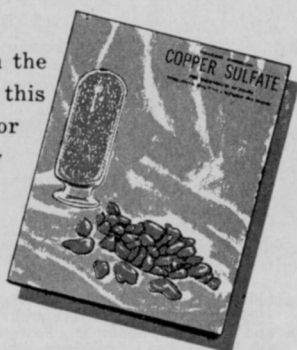
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Wishful Thinking

California health department officials are considering the possibility of requiring licenses from home gardeners before these do-it-yourselfers can apply pesticides, it was reported recently in the public and trade press.

This radical concept represents a culmination of the now-famous pesticide controversy which began nearly two years ago, a controversy marked by frenzy from the start.

Licensing of private citizens as a protective measure is not new. Obviously, automobile drivers licenses are based on the same protective premise. Poison registers in pharmacies keep track of certain drugs and chemicals; licenses are required for hunters, and permits for the right to carry weapons. But if California legislators are in fact serious about licensing home gardeners, we must advocate an extremely cautious study of the possibility.

Reason for the licensing, it is alleged, is that the average homeowner is completely unqualified to deal with toxic compounds; he doesn't understand the chemical structure, means of application, or residual nature; and he probably doesn't read the label.

But we must disagree that such licensing would solve very many problems. Drivers licenses don't stop highway slaughter, and pesticide licenses for private citizens won't stop home accidents. This whole notion is a kind of wishful thinking, that the simple issuance of a home gardeners permit will keep poisons away from children, avoid misapplication, or solve any other tendencies towards misuse.

It would perhaps be better to study the possibility of closer attention to the sale of certain more toxic compounds directly to homeowners. It might even help to investigate distribution patterns of consumer packages, with the possibility of keeping sales of such products in outlets which are managed by people who understand pesticides, their benefits, and their hazards when misapplied.

Another approach is to step up information service to consumers so they understand the real nature of lawn and garden pesticides. Thus they can perform certain simple jobs themselves, and call in the skilled professional applicator for regular service involving weedkillers and insecticides.

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WEEDS AND TURF is the national monthly magazine of urban/ industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.



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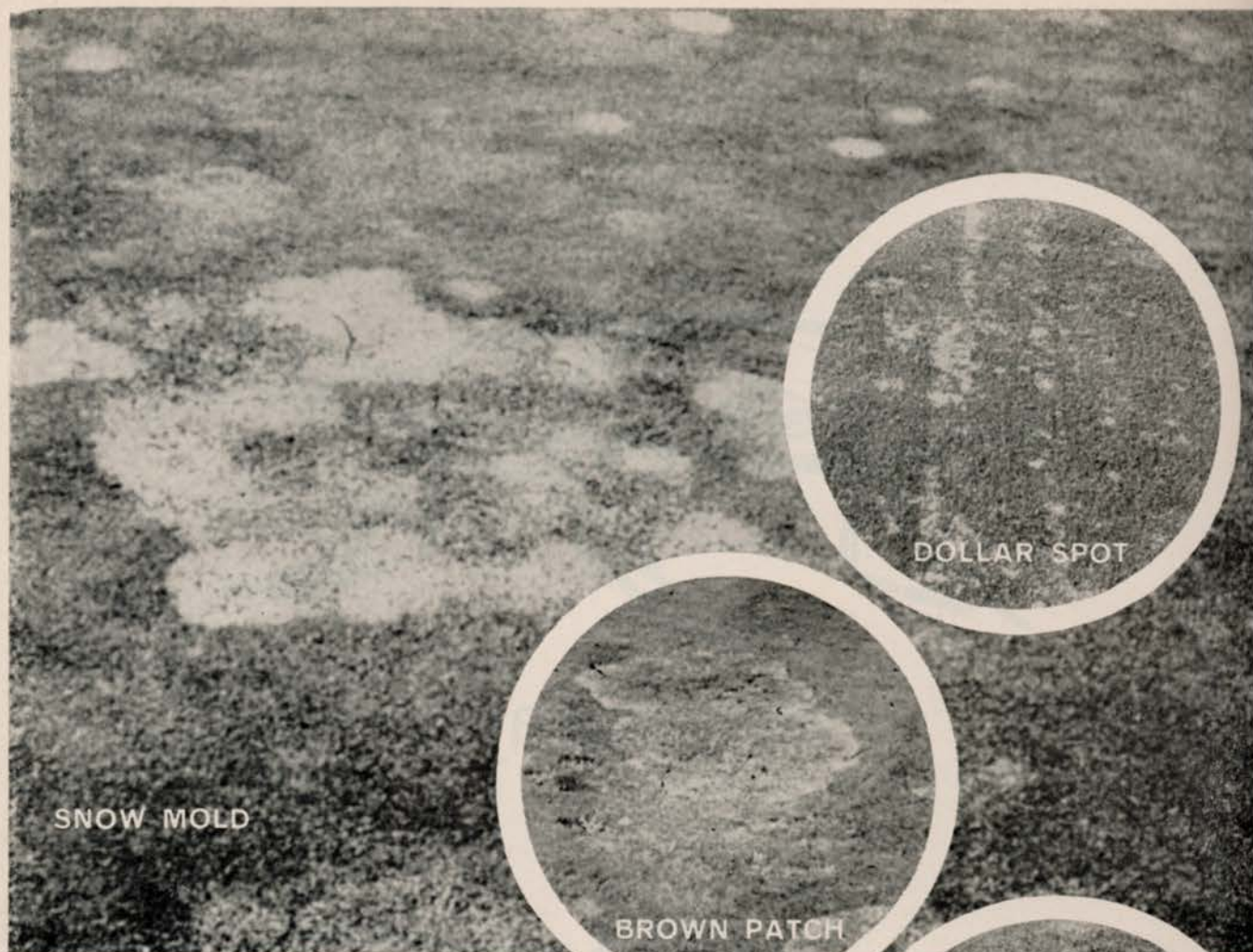


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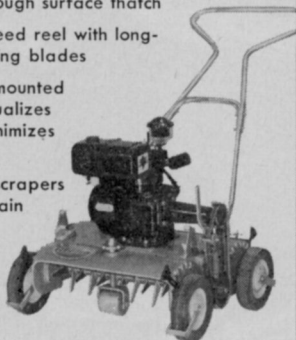
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Spider Mites in N. Y.

One of my first reactions to Vol. 3, No. 1 of *Weeds and Turf* was to write and convey my interest in it as a separate publication. By chance there is in this number an article (p. 17) regarding mites. I thought you would be interested in the situation here in New York.

I refer to the remarks by Hantsberger regarding spider mites. In New York, there are quite a number of spider mite species and eriophyid mites affecting ornamentals. The most troublesome generally is the spruce mite, but many others are serious.

Generally, we have found that malathion is a good mite deterrent, but that it cannot compare with most acaricides in effectiveness of control. In New York, results have been best with Kelthane, Tedion, chlorobenzilate, and very good with Aramite, ovex, Mitox, and Genite. This has been true generally on all woody ornamentals except roses. We do not have a resistance problem to date, which is fortunate.

John A. Weidhaas

Assistant Professor of Entomology
Cornell University
Ithaca, New York

Glad to Have W&T

A magazine like *Weeds and Turf* has long been needed for this specialized field, and I am glad to see Trade Magazines, Inc., take the initiative, and especially elated to see such a splendid job done. Rarely does a magazine arouse me to the extent that I want a subscription, but in the case of *Weeds and Turf* it did just that. Keep up the good work.

Donald J. Arenberg

Agronomist and Lawn Disease
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Weeds and Turf welcomes expressions of opinions from its readers. Send ideas and comments briefly as possible to Charles D. Webb, Editor, *Weeds and Turf*, 1900 Euclid Ave., Cleveland, Ohio, 44115.

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


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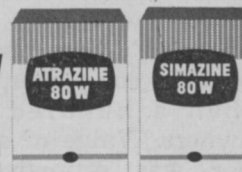
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air STRIKING the Hemlock



Helicopters were a distinct aid in the vast hemlock looper control project in Washington.

AERIAL surveys of evergreen timber in southwest Washington State brought Federal, State and private officials into emergency session: a hemlock looper infestation of epidemic proportions had been found and mapped. Unless the looper was controlled or eliminated, billions of lumber board-feet would go down the waste chute.

At stake was 71,000 acres of prime timber, chiefly hemlock. It was owned by U. S. and State agencies, three large private timber companies, and more than a hundred small-plot owners. Value of standing timber was estimated at \$121½

By **TOM BURRIER**

million; the end product value of the huge tract at \$104 million.

The hemlock looper (*Lambdina fiscellaria lugubrosa* Hulst) is a very destructive defoliator periodically appearing in the spruce and hemlock forests along the coasts of Oregon, Washington, and British Columbia. During the past 75 years six major epidemics and several minor ones have been logged. Hemlock is the preferred host, but during epidemics any "growing green" is devoured.

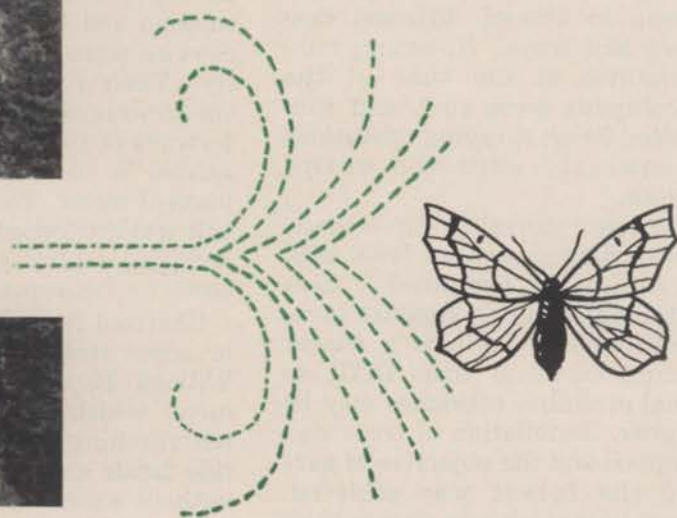
Adult loopers are fragile, buff-colored moths about 1½" from

wing tip to tip. Their larvae move by grasping with the rear legs while extending their body forward, then holding with the front legs while "looping" to bring up the rear. They're also called spanworms, inch worms, and measuring worms.

From mid-September to mid-October females lay eggs almost anywhere, but mainly on moss, lichens, trees, and underbrush. The eggs overwinter. Hatching begins late in May and the larvae crawl upward, eating as they go. They feed first on lower vegetation, but later concentrate on conifers, chiefly hemlock. By



ooper



mid-July results of the larval feeding are quite conspicuous.

The exact cause of outbreaks is unknown, but opinion consensus is that unusual climatic conditions favor looper development. Or perhaps conditions unfavorable to their natural enemies may cause an epidemic. Parasites usually control the looper, aided by predators and disease. A real epidemic may last several years, with usually three years of heavy tree defoliation, during which vast amounts of timber may be killed.

"Our only solution is to spray-kill this looper outbreak, before it can spread further," the ad-

ministrators and foresters decided.

Spraying from the air, a course unavailable in previous major looper outbreaks, was decided upon. DDT, a known saturation killer of the pest, was discussed as the pesticide to be used. But from many sources opposition to DDT spraying was immediate and vigorous.

Hundreds of creeks and streams in the infested area form rivers flowing into Willapa Bay, where commercially important oyster beds and hatcheries are long established. The oyster men feared pollution and kill of their product. Sportsmen's groups pro-

tested that spraying might kill heavy populations of salmon and trout fingerlings in the lakes and streams of this premier vacationland. Wildlife organizations feared for survival of birds and animals in the heavily forested spraying areas.

After hearings were concluded, the State Department of Natural Resources, supervising the combined-forces project, selected helicopters to do the spraying. Because of their ability to "hover" and pinpoint spraying areas, the "choppers" would leave untouched a green belt along each bank of every stream and lake in the area. Spraying would *not* be done when wind velocities touched five mph, to eliminate excessive drift of the selected pesticides.

State Fisheries men would install monitoring weirs in streams leading to salt water Willapa Harbor. Aided by private company entomologists, effect of the spraying on fish and other aquatic life would be thoroughly checked on all streams. During the operation, this was done hourly in some instances. Test fingerlings were given "before and after" checks. Every physical safeguard possible was incorporated into the Department's final plan for the Willapa Project.

About June 1 a final survey of the looper larvae was made by both air and ground teams. From these reports, it appeared July spraying would achieve maximum kill results. Two private helicopter firms, their personnel long experienced in spray operations, contracted for the job. Their combined equipment was capable of spraying 6,000 acres per day, averaging four hours of flight time daily for nine machines. This performance estimate assumed ideal weather-flight conditions.

The project staff, taking cognizance of the public hearings and protests, selected the insecticide Sevin for use on the bulk of the project. It had never been used on the looper on a wide scale, but laboratory tests, and application on similar pests,



Weirs like this were used to check for fish damage.

indicated it would control the looper. Sevin had been extensively tested by the U. S. Fish and Wildlife Service and declared "safe." It had also been applied experimentally on oyster beds to control predators. As far as effect on young salmon, Sevin had been proved 18 times safer than DDT.

In addition to Sevin and DDT, two other materials were scheduled for test against the hemlock looper, on carefully controlled test plots. The helicopters' precision work made these pilot tests possible. One of the compounds was *Phosphamidon*. Like *Sevin*, it had low residual properties and was rated less toxic to fish and wildlife than DDT.

The second experimental material was *Baccillus thuringiensis*, an insect virus. This material, nicknamed "BT," was sprayed on an isolated 300 acres on an island in Willapa Bay itself. This application was supervised by technicians from the U. S. Forest Service. Long-range outcome could be of considerable significance, in showing the way toward long-sought biological control of harmful insects.

To complete spraying quickly as possible once begun, 41 separate fueling and pesticide-supply points were established. Often during the operational spraying, which began in July, the helicopters could work but an hour or so per day, due to adverse wind and weather conditions. More than 60 men were engaged full time on the project, plus dozens of "interested observers" from a variety of organizations.

By the end of July, actual spraying was completed. Field crews of entomologists and

laboratory technicians kept careful tally of looper mortality in the different-insecticide areas, while other crews checked effects on fish and wildlife, and tested dozens of creeks for residual traces of spray.

In the project's first spraying, some 12,000 acres not draining into Willapa Bay were treated with DDT. Numerous field checks seven days later showed 99.7% looper mortality. Preliminary figure for the *Phosphamidon* experimental application, on 2,250 acres, indicated a 75.9% looper kill. These figures were not deemed conclusive, however, until longer time-period checks could be made.

Interest in the Sevin-sprayed acreage was, of course, the greatest, since here was a pesticide said to be practically harmless to shellfish and wildlife. Project technicians applied Sevin in several different dosages and ways. However, temperatures at the time of the treatments were cool, and rain halted Sevin spraying operations frequently over the entire region.

Looper mortality in Sevin-sprayed areas ranged from 80% to 87%, when measured 13 days after application. Against hemlock loopers, Sevin is a slower acting chemical than DDT, so final mortality estimates may be higher. Defoliation of trees was stopped and the objective of saving the forest was achieved. Over-wintering egg counts have just been completed, and in the majority of areas treated, egg populations were significantly reduced.

Although Sevin was giving sufficient kill to be used on more than 40,000 acres of the infested

Typical mixing station on site of the hemlock looper spray project.



forest, private foresters decided to use DDT for looper control on 14,000 acres of timber company land to utilize the compound's proven performance and faster kill.

Most heartening were the fish and wildlife reports.

Pollution Control Commission officials who headed the water monitoring activity reported little if any side effects on stream life in any area, regardless of spray type. No observable damage was noted in fish, crayfish, or caddis fly larvae in either DDT or Sevin sections, where water monitoring was most intense. There was damage to young mayfly larvae in DDT-sprayed areas, but the adult mayfly was unaffected.

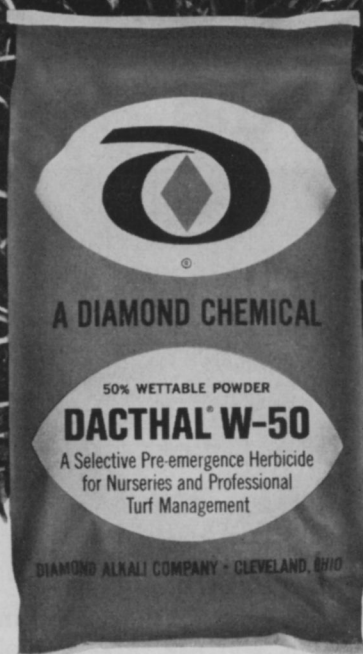
Frequent staff meetings between private timber company technicians, and staff members of the Pollution Control Commission and U. S. Public Health Service were a continuing activity. Their reports showed that the concentration of DDT in waterways of the project never exceeded 1/2 part DDT per billion parts of water. This excellent result was attributed to the precise spraying control and care exercised by helicopter pilots.

Charcoal filters were installed in some streams flowing into Willapa Bay; another "experiment" which proved that all water reaching oyster production tide lands could be purified, without excessive cost, of residual pesticides.

The lumber and timber industry in British Columbia, Washington and Oregon is one of the region's basic industries; employing many thousands of men, and turning out products worth hundreds of millions of dollars annually. It seems certain that periodic epidemics of tree-destroying insects will continue to plague the evergreen forests for some time to come.


The value of the Willapa Project—aside from saving the growing timber—is in furnishing proof that large-scale control of these insect epidemics is possible, *without* disturbing the other positive values of our wild forest land.

Weed-free turf!



DACTHAL® W-50 now available for professional applicators

Now Dacthal, the proven pre-emergence herbicide, is available in a professional package. Look for it in this bag if you do commercial application work on golf-course greens and fairways, parks, rights of way, etc. For full information, contact your distributor or write Diamond Alkali Company, 300 Union Commerce Building, Cleveland, Ohio 44114.

 **Diamond Chemicals**

A basic guide for turfgrass managers



How to Select the Right Turfgrass



EACH spring marks the beginning of a battle fought from metropolis to hamlet the nation over, against weeds in turf.

In an era of outdoor living, attractive suburbs, and increasing appreciation of quality, weedy turf is not to be tolerated. Fortunately, technology is up to the challenge, thanks to a large arsenal of selective and effective herbicides, ever more convenient applicators with which to distribute them, and increasingly capable professional turf managers.

But all of this is not yet automatic, not a push-button affair in which the weeds become annihilated with the stroke of a magic wand. There is still need for human judgement, though

By **DR. ROBERT W. SCHERY**

Director, The Lawn Institute
Marysville, Ohio

most products carry clear instructions and are largely foolproof. One still needs to know what is a weed and what is not, and then recognize if possible what kind of a weed. Not all pests fall before the same pesticides—else there would not be “selectivity,” so much a miracle of modern weed control. Selectivity, of course, separates the grass sheep from the weed goats. And, it does take brainwork even for the routine (but vitally essential) exact application of pesticides, at just the right time.

So there is no substitute for understanding something about lawns as a community of living

things, as professional turfmen know so well.

Most turf managers realize they will have to identify the more onerous weeds before they can choose the proper herbicide to control them. What they don't always realize is that they should know lawngrass types equally well. This is sometimes pretty tough, even for the expert. It is complicated because inexpensive seed mixtures often contain hay-grasses little better than weeds, and more difficult to get rid of.

In the topflight Kentucky bluegrass blends for the North, there is usually included some fine fescue, in varieties such as *Chewings*, *Illahee*, *Pennlawn* and *Rainier* (selections developed in Oregon).

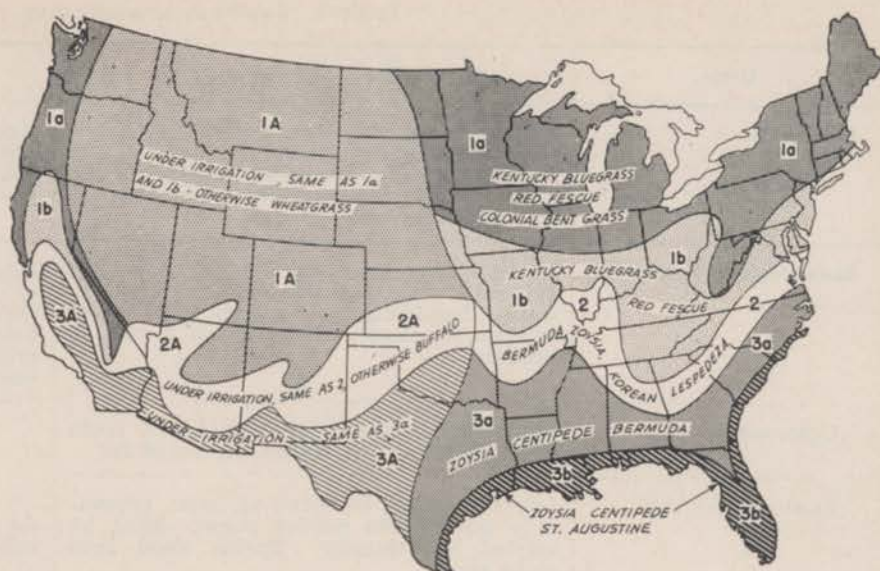
It is not surprising, then, that

individuals not thoroughly acquainted with lawngrasses don't recognize they may be introducing "weeds," when they plant seed mixtures containing a coarse haygrass fescue, tall fescue (in varieties such as Kentucky-31 or Alta). There is a world of difference between the elite fine fescues (*Festuca rubra*) and the clumpy tall fescues (*Festuca arundinacea*). The former are peers of Kentucky bluegrass, the latter a coarse bunchgrass inadmissible to the society of fine turfgrasses.

Grasses Basically Similar

Adding to the difficulty for the average fellow is the basic similarity among grasses. It is much harder to distinguish a grass weed from a lawngrass, than it is a broadleaf weed (like a dandelion) from a grass. Almost everyone recognizes dandelions, clover, plantains, ground ivy, and suchlike. But almost any rough grass has good chance of being termed "crabgrass" by the inexperienced, even the quite dissimilar tall fescue above mentioned. Certainly great disappointment is in store for the lawnsman who tries to eliminate tall fescue with a crabgrass killer! In their younger stages many annual grasses, such as foxtail, much resemble crabgrass, and even the expert is hard put to make the distinction. Nimblewill looks a lot like a patch of bent, or in border states may be confused with Bermuda. *Poa annua* is hard to tell from other bluegrasses in the spring, and the trailing *Poa trivialis* (rough bluegrass) could be confused with Kentucky bluegrass. In the South, where the wealth of weeds and grasses seems almost beyond comprehension, things can become so confusing that one dare not even generalize.

On the positive side, good lawngrass is, fortunately, easier to maintain than poor. First of all, the major lawngrasses are a pretty vigorous lot, hard to knock out, quick to recuperate. Else they wouldn't be lawn favorites. With most of the good-looking turfgrasses there is pretty good chance to find some chemical which will do the



map courtesy American Potash Institute

Figure 1. Areas where various turfgrasses are usually most effective.

Zone 1 (1a & 1b)

Natural Kentucky Bluegrass, *Poa pratensis* (including Arboretum, Delta, Newport, Park, Troy); **Red Fescues***, *Festuca rubra* (including Chewings, Creeping Red, Illahee, Pennlawn, Rainier); Clover, *Trifolium repens*.

1a only—**Merion Kentucky Bluegrass**; **Colonial Bent Grasses**, *Agrostis tenuis* (including Astoria, Highland); occasionally Creeping Bent, *A. palustris* (including seeded Seaside and Penncross, plus golf green varieties); **Rough Bluegrass**, *Poa trivialis*.

1b only—warm, difficult sites, possibly Tall Fescue; Bermudas (annually seeded, or hardy varieties such as U-3); Redtop, *Agrostis alba*.

Zone 2

Tall Fescue*, *Festuca arundinacea* (Kentucky-31, Alta); **Zoysias**°, *Z. matrella* (especially Meyer strain of "japonica" or Japanese lawngrass); **Bermuda**, *Cynodon dactylon* (seeded or vegetative); **Kentucky Bluegrass****°; **Red Fescue****°; **Korean Lespedeza**, *L. stipulacea* for temporary cover.

Zone 3 (3a & 3b)

Zoysias* ("matrella" strains; Emerald); **Centipede**, *Eremochloa ophiuroides*; Carpet, *Axonopus* sp.

3a only—**Bermudas** (seeded, and varieties such as Tiffine, Tiflawn, Tifgreen, Texturf); **African or Uganda**, *C. transvalensis*; **Sunturf**, *C. magenesii*.

3b only—**St. Augustine**°, *Stenotaphrum secundatum* (including Bitter Blue, Floratine); **Bahia**, *Paspalum notatum* (including Pensacola); Bermuda strains.

Zones 1-A, 2-A, 3-A

These are arid versions of 1, 2, 3. The same species can be used where watering is possible, or in the higher mountains. Where irrigation is limited, some of the prairie grasses may have to be used, as:

1-A—Buffalo, *Buchloe dactyloides*; Sheep or Hard Fescue, *Festuca ovina*; **Wheat Grasses**, *Agropyron* (Crested—Fairway strain; also Intermediate, Slender, Western).

2-A—Buffalo; Gramas, *Bouteloua*; Love grasses, *Eragrostis*.

3-A—Buffalo; Love grasses (Boer, Lehman, Weeping); Meadow Fescue, *F. elatior*, in Southwest.

Ryegrass, perennial; and annual, Italian or domestic, *Lolium perenne* and *L. multiflorum*, are major ingredients of "cheap mixtures" in the North and temporary "wintergrass" in South; not good turf species.

Tall fescue (Kentucky-31 and Alta) is often an ingredient of "economy" mixtures, and may have some use in middle latitudes, which have hot, dry summers. Like ryegrass, it is not a really first-rate lawngrass, and should be avoided if possible.

* stand shade well

** prefer shade
most-useful species are in boldface

Table 1. Southern Lawngrasses

Grass	Thumbnail Sketch	Pests And Most Used Pesticides
Bahiagrass	Utility lawns, not demanding great care, adapted to sandy soils along coastal plain. Medium coarse, spreading fairly slowly. Low cost, started from seed. Seedheads a mowing nuisance.	Needs usual weed control, tolerant to phenoxy's but not arsonates, atrazine-simazine, and most northern weedkillers. Disease and insects not usually serious.
Bermudagrasses, all kinds	Fast growing, excellent for both lawn and specialty turf, but needs regular care (frequent fertilization, mowing, etc.). Not tolerant of shade. Can become a pest in borders.	Like bluegrass in the North, quite tolerant of most herbicides, but avoid atrazine-simazine: choose according to the weed being controlled. DSMA gets rid of dallisgrass. Although attacked, shakes off most insect and disease complications.
Common	Somewhat coarser, easily planted from seed: looks well if reasonably cared for.	
Sunturf and U-3	Improved, finer textured varieties, reasonably hardy into border states. Must be started vegetatively. Spring dead spot some areas.	As for group. Some of the selected varieties are more sensitive than common.
Tifgreen, and similar improved selections.	Elite fine-textured varieties for superior lawns and golf greens, requiring generous care. Vegetative starts only. Thatch.	
Centipede	A medium-textured, rather slowly spreading lawngrass, especially for poor soils and low maintenance. Resents alkalinity and high fertility. Start from seed (2 years) or vegetatively.	Treat considerably with phenoxy herbicides. Avoid arsonates; can stand atrazine and simazine. Some debilitating insects such as ground pearl, but generally hardy.
St. Augustine, including Bitter Blue, Floratine, etc.	Coarse, but widely used old favorite, well adapted to shade. Moderate growing, now experiencing serious difficulties with chinch bug and disease. Must be vegetatively started.	Injured by arsonate and often by phenoxy herbicides, but tolerant of atrazine and simazine. Needs constant insecticide treatment against chinch bug (Trithion, Diazinon, Ethion, etc.) and often fungicide (PCNB, Thiram, etc.).
Zoysia, all kinds	Among best of southern turfs once established, but slow to grow. Tolerates shade, quite winter-hardy. Adapted to almost any soil and maintenance with only moderate care.	Not injured by usual lawn herbicides; tolerates preemergence use of simazine-atrazine. Weeds a serious problem with new plantings because of slow growth. Like Bermudas, attacked by but usually not seriously injured from disease and insects (except billbug in Florida).
"Japonica"	Coarser form, can be started from seed.	
"Matrella"	Finer textured, more attractive forms for deep South, started vegetatively.	As for group.
Meyer	Medium coarse variety, quite hardy in North (but poor winter color in South). Vegetative starts only.	

weeds in, without harming the lawngrass (at least more than temporarily). That's why we can take a wide range of broadleaf weeds (Dicots) out of grass these days, with the miraculously effective phenoxy (2,4-D) group of chemicals. That is why we can even separate grass from grass, as when we prevent crabgrass in bluegrass lawns by using preemergence chemicals (Dacthal, Zytron, Betasan, arsenicals, Trifluralin, etc.). Or it can be knocked out, after it gets started, with the arsonates (DMA,

AMA). Yes, ruggedness and beauty go together splendidly in most of the widely used lawngrasses.

Occasionally, because of wide dissimilarity in grass type, and marked differences in climate where grown, a herbicide that is very effective in one location may not "cut the mustard" in another. Some of the better northern herbicides, such as 2,4-D and the arsonates, injure subtropical turfs such as St. Augustine. On the other hand, St. Augustine in its turn is remarkably resistant

to certain chemicals such as simazine and atrazine, which almost sterilize a Corn Belt soil for many grasses. It will be necessary to await subsequent opportunity to take a closer look at individual grasses, their strengths and weaknesses, as far as herbicide resistance is concerned. This article looks over the nation as a whole, pointing out which grasses grow where, and the main features which must be considered in their use, and in the prevention of weeds.

Probably the easiest way to

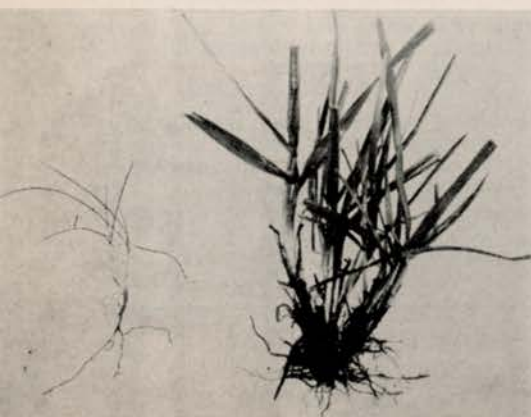
Table 2. Northern Lawngrasses

Grass	Thumbnail Sketch	Pests And Most Used Pesticides
Bentgrass, all kinds	Outstandingly attractive for close-mowed turf, but requires care (attentive mowing, ample fertilization, usually irrigation and fungicidal protection). Will thatch. Most at home in moist, coolish locations.	Various summer diseases, winter snow mold are main affliction; use broad spectrum fungicides. Typical insect and weed troubles, controllable with insecticides, phenoxy and other northern-type herbicides (use care).
Highland	Lawns and fairways, usually mowed ½-1 inch. Represents the less demanding non-creeping varieties which also include Astoria and other Colonial types. More erect, less temperamental; high-quality seed from Oregon. Highland is from a section where summers are hot and dry; should be adequately adapted to most of East.	Usually less demanding than creepers, and often less afflicted with disease. Will tolerate most herbicides, including Banvel for clover, though temporarily scorched by Zytron (sprays) and Silvex.
Pennecross	Mostly golf greens. Exquisite creeping bent, available as seed, representative of all creepers including vegetative selections. Prolific growth gives dense patches that don't mix well in other turf. Thatch is often serious. Extra and constant care needed, usually very close mowing.	Fungicides at recommended rates are safe. Be very careful or don't use phenoxy herbicides at all. Seem able to take pre-emergence treatment as with familiar crabgrass preventers.
Redtop	A coarse species used as nursegrass, seldom permanent, not a component of better seed mixtures.	Impermanent cover, not worth treating.
Bluegrasses, all kinds	Outstanding general-purpose turfgrasses, attractive, spreading, recuperative. Survive best under high mowing, and do not need elaborate care. All varieties from seed.	Weed invasion perhaps the most frequent trouble, but major weeds are easily controlled with phenoxy, preemergents and arsenicals. Sometimes sod webworm or grubs.
Kentucky, natural	A rugged performer, widely adapted, workhorse of lawn seed mixtures.	Not a prima donna; holds up well under all familiar treatments, including Zytron and Banvel sprays. Attacked by leaf spot disease (<i>Helminthosporium</i>), but seldom succumbs if mowed tall and not overfertilized.
Merion	An elite variety for lower growing turf. Heavy feeder and may thatch. Perhaps better adapted to northern than southern reaches of bluegrass belt.	As with other bluegrasses, except not tolerant of phenyl mercuries (PMAS) formerly much used against crabgrass. Leaf spot disease resistant.
Park	A sturdy variety, fast sprouting with seedling vigor. A combination of natural bluegrass selections.	As with natural Kentucky bluegrass.
Rough bluegrass (<i>Poa trivialis</i>)	For damp shade. A rather delicate species without wear-resistance, similar to bentgrasses.	Limited weed invasion. Treat more carefully than Kentucky bluegrass, about as considerably as bentgrass.
Fescues	Extremely rugged and drought-resistant.	About as with Kentucky bluegrass.
Fine fescues (Chewings, Creeping red, Illahee, Penn-lawn, Rainier, etc.)	Fine lawngrass, good companion for Kentucky bluegrass. Well adapted to shade, dry soil and minimum fertility.	Experiencing similar pests as for Kentucky bluegrass and similarly treated. Not quite so tolerant of some pesticides as is bluegrass (viz. Zytron).
Tall and meadow fescues (Alta and Kentucky-31 varieties).	A pasture species, tough and coarse, often planted on roadsides and sometimes play areas.	Few pests, and in any event seldom worth worrying about.
Ryegrass	Mainly pasture cover, but because of low cost often main component of "cheap" seed mixtures.	Wide range of diseases and weeds, but unlike with superior, perennial grasses hardly worth expense of treatment.
Annual or Italian	May be legitimately used in small quantities as nursegrass, or as temporary cover. Quick to establish, but turns coarse.	Damping off of seedlings may sometimes be serious, but preventive measures doubtfully worth cost with this impermanent grass. Weeds come as ryegrass dies.
Perennial	Finer textured, more attractive than annual, but does not make first-rate sod. Fairly long-lasting under proper conditions.	As for group.

accomplish this is through a chart. A reference chart appears on pages 18-19. Lest the weed problems seem to overshadow the positive qualities, keep in mind that any good turfgrass licks most of its own weeds. But you must give it the chance to "be there fustest with the most-est." For example, crabgrass has little chance, if through autumn and spring a tight bluegrass sod is built through correct fertilization, high mowing, and the bolstering of thin sod with good seed. Few weeds can crowd out zoysia, if this elite turfgrass has been helped through its early years by weed control, watering, and fertilization. First attention should be directed to fulfilling the lawngrass' needs. Herbicide application is a mopping-up action, to take care of what the grass has not been able to cope with. If weed problems are great and persistent, take a second look at your turf maintenance program; herbicides can't make up for faulty procedures!



Above is the vaunted Kentucky bluegrass plant as it would appear if let go to seed. Pencil points to an underground spreading stem (rhizome), responsible for knitting the tight sod so characteristic of this grass. Below are two fescues. The tall fescue to the right is unsuited as a lawn grass, while the fine-textured member of the red fescue group on the left is the peer of Kentucky bluegrass.



Speakers at this year's New England Herbicide Workshop included (left to right), front row: Roland E. Roberts, Univ. of Maine; Jay S. Koths, Univ. of Conn.; and Robert J. Schramm, Jr., Boyce Thompson Institute. In second row are Arthur Bing, Cornell Ornamental Research Lab; John Havis, Univ. of Mass.; and John Ahrens, Conn. Agr. Exp. Sta.

Present and Future Uses of Herbicides Studied at Annual New England Workshop

Current and coming uses of herbicides in ornamentals and other crops received penetrating analysis during the annual New England Herbicide Workshop at the Waltham Field Station in Waltham, Mass., Feb. 4.

More than 100 herbicide-oriented researchers, developers, applicators, and users were present this year.

Uses of herbicides in herbaceous perennial and annual ornamentals were outlined by Dr. Arthur Bing from the Cornell Ornamentals Laboratory in Farmingdale, L.I., N.Y.

"Where practical," Dr. Bing said, "we recommend preplanting treatment with a soil sterilant such as steam, methyl bromide, Vapam, or Vorlex, especially for seeds or closely set small plants."

Preplant treatments with EPTC, Trifluralin, and some experimental materials, have been successful with such ornamentals as dahlia, marigold, and petunia. EPTC incorporated at 10-15 lbs. active ingredient per acre shows great promise for the control of quackgrass and Artemesia, Dr. Bing reported.

Use of herbicides in commercial nursery plantings were detailed by Dr. John Havis from the University of Massachusetts in Amherst. He has found that the one material most useful in commercial nursery stock is simazine.

Dr. Havis said that 1½-2 lbs.

active ingredient per acre of simazine will give adequate control for many weeks in nurseries.

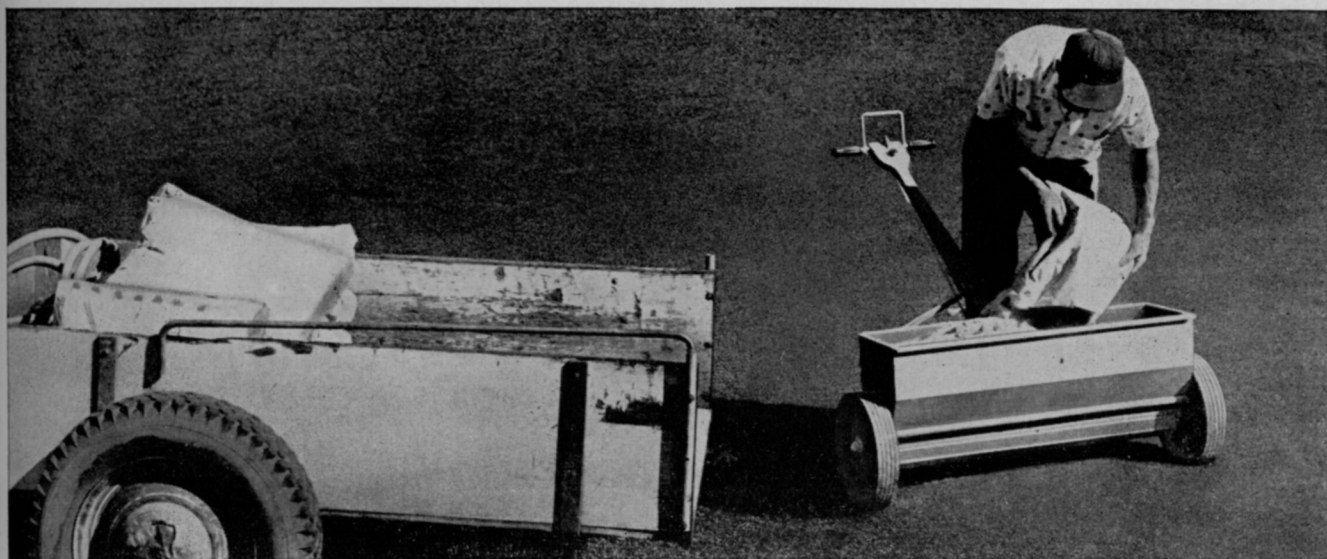
Fall applications of simazine have proven to be more beneficial than spring in that a lower rate of application has given adequate control of weeds during the spring season, the Massachusetts researcher elaborated.

One of the coming uses of herbicides listed by Dr. John Ahrens from the Windsor Field Station of the Connecticut Agricultural Experiment Station dealt with an application under a mulch. Simazine applied under a mulch of salt hay or plastic film has increased the growth of young apple trees as much as 75%, Dr. Ahrens indicated. Of interest to *Weeds and Turf* readers is the fact that this technique might have wide application in the establishment of ground covers on slopes such as highway embankments.

Dr. Ahrens commented on the situation where one resistant weed species tends to become a problem with the use of a single herbicide. Combinations of 1 to 2 lbs. simazine plus 3 lbs. diphenamid or 6-8 lbs. Dacthal or 3-4 lbs. EPTC, have shown some promise and may replace straight simazine applications in the future.

Research has shown that activated charcoal, when applied to the soil, will inactivate simazine, thereby making it safe to plant

(Continued on page 31)



Grounds keeper applying a new dieldrin-fertilizer mix. He's getting two essential Spring jobs done in the time it used to take to do one.

WORK-SAVERS:

New dieldrin-fertilizer mixes give you season-long control of all major turf pests—save time and expense of special insecticide application

Dieldrin controls Japanese beetle grub, white grubs, sod webworm, ants and other pests that feed on grass roots, cut off moisture and nourishment, cause browning and bare spots.

Dieldrin also controls annoying, health-endangering surface pests such as ticks, fleas and chiggers. And now, getting this essential job done is easier than ever.

Now is the time to size up your turf insects problem and do something about it. If you cannot start healthy, vigorous grass growing in certain areas, or if you have bare patches, soil insects could be the cause.

Turn up some sod in these trouble spots and sift through the dirt. See if you don't find grubs or some other evidence of soil insects.

If these soil insects are your problem, you can control them with dieldrin.

A single application lasts for a year or more. It protects roots—lets them utilize moisture and nourishment.

No special application

Dieldrin is now available in ready-

made fertilizer mixes. They let you get two essential Spring jobs done at once. You avoid having to make a special insecticide application, save time and money.

However, if you prefer, dieldrin can also be sprayed on turf as a liquid or applied in granular form with a fertilizer spreader.

Controls ticks, fleas and chiggers, too

Dieldrin also controls ticks, fleas and chiggers. These pests are not only annoying, but also are public health problems.

In addition to applying dieldrin to turf, to get maximum control of these

above-ground pests, treat weeds, the ground around low-growing shrubs and buildings—anywhere these pests might take refuge.

Where to get dieldrin

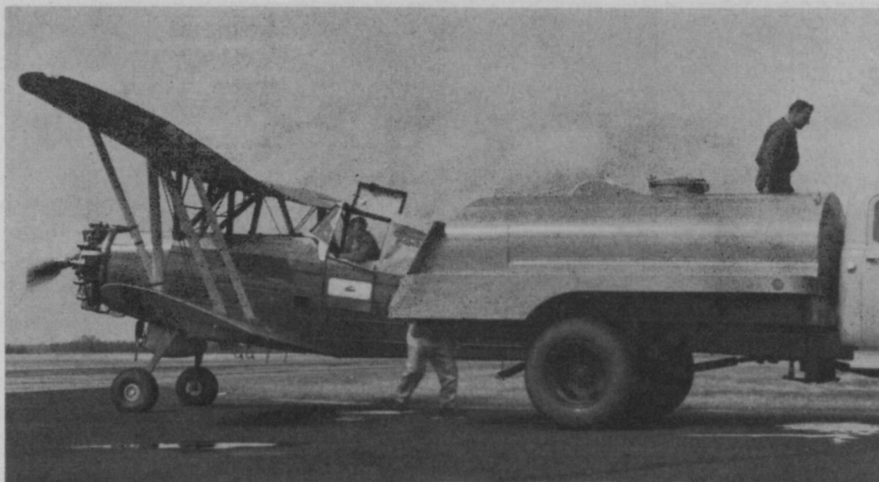
Dieldrin is available from your local insecticide dealer under many well-known brand names. Accept no substitute. Check the label or the ingredient statement on the formulation you buy for the name *dieldrin*.

For additional information on turf insect control with dieldrin, write: Shell Chemical Company, Agricultural Chemicals Division, 110 West 51st Street, New York 20, N. Y.



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Grumman AgCat stopped to refill with pesticide during the Texas aerial application exhibition.

Major Pesticide Curbs Unlikely, Texas Aerial Applicators Hear

By **GEORGE L. EARLE**

Assistant Editor, Department of Agricultural Information
Texas A&M University, College Station

No major state or federal legislation to restrict the use of chemicals on food products is foreseen by John C. White, Texas State Commissioner of Agriculture. The official was a speaker at the Thirteenth Annual Agricultural Aviation Conference and Short Course on Pest Control Feb. 23-25 at Texas A&M University, College Station.

White's comments were part of a varied program offered delegates to the annual affair, which seeks to increase the technical competence of a growing number of companies which practice aerial application of pesticides, including custom applicators.

Also on the program was a talk by Minneapolis, Minn., attorney L. L. Schroeder, who detailed the legal liabilities which aerial contract applicators are subject to.

First thing for the flying applicator to do, Schroeder said, is to study local, state, and federal laws relating to the use of airplanes for applying chemicals to plant life.

Schroeder said that the remedy for many hazards is adequate insurance, although applicators must continually seek to reduce the instances in which such insurance would be necessary.

How do pilots get proficient?

One obvious method is through training schools, advised Nicholas C. Merrill, who's Director, Agricultural Aviation, Department of Aviation, Ohio State University, Columbus.

Only two continuing agricultural pilot training courses exist in the United States today, Merrill said. One is at Ohio State; the other is the Agricultural Aviation Academy at Minden, Ohio.

The two U.S. schools produce only 50 pilots a year, though the need is for many more, Merrill observed. With the increased use of aerial application, more qualified pilots must be trained.

While agricultural pesticide drift, whether from ground or aerial application, cannot be completely eliminated, it can be significantly reduced, delegates

A Piper Pawnee agricultural airplane (right) showed how it operates emergency dumping apparatus during the annual conference. Below, a helicopter hovered over the field prior to a spray demonstration.



heard in an address on this problem.

"Generally the greatest cause of drift is inefficient application of chemicals," according to Norman B. Akesson, professor of Agricultural Engineering with the University of California, Davis.

Careless application causes a high degree of drift and makes it necessary to use more pesticide, he elaborated.

Dust applications of pesticides have been popular for many years but their use is declining for two basic reasons, Professor Akesson revealed. First, the control residue deposited on the plants is 1/4 to 1/3 that of a comparable spray when applied by airplane. Dusts also drift farther from the application area than do sprays.

Dusts, however, continue to be used by aerial applicators because they have greater effectiveness in certain insect control programs. Also, since dusts require no mixing or formulating at the application site, less labor is needed to handle and apply this form of pesticide.

There is evidence that some pesticides are more toxicologically effective as fine-particle dusts than as sprays. Agricultural dusts consist of particles with a size range of roughly 0.1 to 25 microns, with an average size of about 5 to 10 microns. These fine particles are about 25 to 30 times smaller than a fine spray and will penetrate plant foliage and deposit on the back of leaves, while larger spray particles will not.



There's an "ANSAR" weed control product to meet your needs!

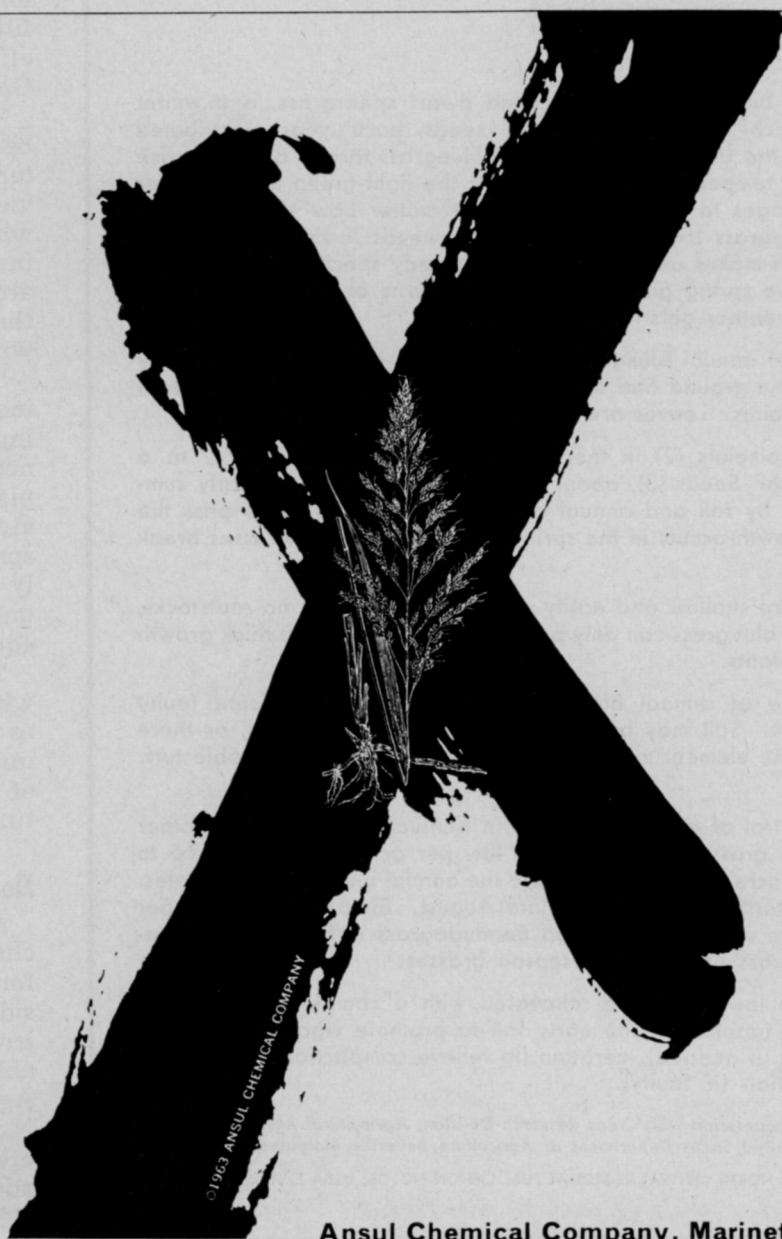
Look for the "Ansar" name and trademark on herbicides and weed control products. They're proven in use . . . backed by the world's largest manufacturer of organic arsenicals. Write . . . tell us your requirements! Part of our service is personal, problem-solving consultation.

"ANSAR" 184 D.S.M.A for selective control of crabgrass and Dallisgrass in turf.

"ANSAR" 170 MONOSODIUM METHYLARSONATE a concentrated solution with properties similar to D.S.M.A.

"ANSAR" 138 CACODYLIC ACID a highly effective non-selective herbicide that produces no residual effect.

"ANSAR" 290 METHYLARSONATE + 2, 4 D a combination herbicide effective on both broadleaf and grassy weeds.



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ANNUAL BLUEGRASS (*Poa annua*)



Annual bluegrass (1), also called dwarf speargrass, is a winter annual which sprouts anew from seeds each year. Distributed throughout the United States, annual bluegrass thrives on moist, rich soil in cool temperatures. This weed is the light-green lawn invader which manages to form seed heads no matter how short it is cut. Annual bluegrass is unique among lawn weeds in this respect. The factor which makes annual bluegrass a weedy species is that following its active spring growth, it sets seed, turns brown, and dies out when the weather gets hot and humid.

Stems of annual bluegrass are one to 12 inches high; they may run along the ground and turn up at the ends. They sometimes root from stem joints. Leaves are light green and very soft.

Small spikelets (2) in the panicle, or seed head, bear 2 to 6 flowers each. Seeds (3), about $\frac{1}{16}$ inch long, shed in the early summer, sprout by fall and annual bluegrass forms rosettes to pass the winter. Growth occurs in the spring before most other grasses break dormancy.

Roots are shallow and easily pulled up. There are no rootstocks, and annual bluegrass can only produce a dense sod by a thick growth of single plants.

Presence of annual bluegrass on a lawn may indicate faulty maintenance. Soil may be too wet, it may be compacted, or there may be some element missing which is weakening the desirable turf-grasses.

For control of annual bluegrass in Kentucky bluegrass and other cool-season grasses, Dacthal at 10 lbs. per acre or Zytron at 15 to 20 lbs. per acre may be used before the annual bluegrass germinates. It usually starts germination in late August. Simazine at 1 lb. per acre may be used in Zoysia and Bermudagrass turf, but not in Kentucky bluegrass or other cool-season grasses.

Infested lawns may be renovated with a complete program of fertilization (applied in the early fall to promote vigorous desirable turf), liming (if needed), aeration (to relieve compaction), and drainage correction (if faulty).

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)

Turf-Water, Irrigation Devices Studied at U. of Calif. Turf Day

"Infiltrometers, which test how deeply water penetrates turf, in combination with aerators, can help one revive turf areas which hold water after irrigation because of compaction," Fred Gorman, Farm Advisor, San Bernadino County, Calif., asserted in his address to the University of California Turf Conference, Feb. 11, at the Davis campus.

When 5-inch-deep aeration holes are placed 2 inches apart, water seeps into soil at the rate of 2½ inches per hour. Before aeration, Gorman showed, the rate was 1/16 inch per hour.

Movement of water in the top 4 to 6 inches of soil is essential for healthy roots and turf. Infiltrometers help indicate the efficiency of aeration operations, Gorman indicated.

"Water efficiency on turf can be controlled effectively by water sensitive (hydrostatic) devices such as the tensiometer, which shows how much water is in the soil," Dr. Sterling J. Richard, Soil Physics Professor on the Riverside campus showed with results of 1962 research.

"A gardener applied 60.5 inches of water to a plot by judging when he thought the turf needed water," Dr. Richard explained. "But a plot with a tensiometer, which activated sprinklers when the turf actually needed moisture, only required 40.2 inches of water to an equal sized plot."

The tensiometer indicates when soil tension becomes high as a result of dryness. Richard implied that a saving of 20 inches of irrigation water over large turf areas is significant.

New Folder on Amitrole-90

A new 6-page illustrated brochure on the use of Amitrole-90 for control of weeds along roadsides, in industrial areas, and in irrigation systems, is now available from American Cyanamid, Agricultural Division, Princeton, N.J., and will be mailed to readers who write the firm at that address. Ask for bulletin PE-5287.

make a killing with **TRITAC**TM

Profit from this powerful new herbicide for control of bindweed, Canada thistle, Russian knapweed, hoary cress, leafy spurge

Bindweed on May 23, 1963, just before Tritac treatment . . .



looks like this on August 14, 1963. Rate: 15 lb. (7½ gal.)/A.



You can effectively custom-treat an acre for a season or more with as little as four to eight gallons of Tritac.

Used along highways, fence rows and other noncrop land, this economical new herbicide controls certain deep-rooted perennial weeds under a wide range of climatic conditions.

When you want quick foliage top kill or want to prevent seed

formation, use Tritac-DTM—the basic formula plus 2,4-D.

Both Tritac and Tritac-D are noncorrosive and low in toxicity to mammals.

Tritac, for the first time, is now available in a new granular form called Tritac-10G.

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

granular Tritac is packed in 25 pound paper bags.

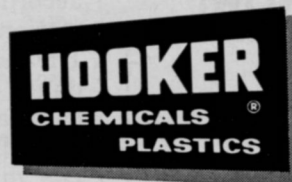
Hooker sodium chlorate. This original one-shot weed killer is available in steel drums of 50 and 100 lb. net.

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**Business Clinic, Plot Tours to
 Mark 3rd Annual Fla. Turf Show**

A detailed series of talks on small-business management, and a half-day tour of turf research plots, will highlight the Third Annual Florida Turf-Grass Trade Show April 30-May 2 at the Hotel Seville, Miami Beach.

Tours of turf plots at the nearby Plantation Field Laboratory in Ft. Lauderdale will be broken down into the following fields of major interest: lawn maintenance; parks, cemeteries, athletic fields; sod growers; golf superintendents; garden supply dealers; and horticultural spraymen.

An extensive show of newly developed turf maintenance chemicals and equipment will run throughout the affair in the Hotel Seville.

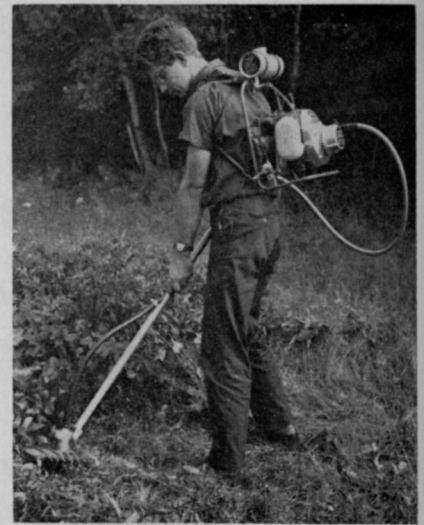
More than 500 registrants are expected, according to Walter D. Anderson, Executive Secretary of the Florida Turf-Grass Association which co-sponsors the event along with the Horticultural Spraymen's Association of Florida, and the Florida Society of Golf Superintendents.

Several lunches, dinners, and other social get-togethers will accompany the technical sessions, Anderson told *Weeds and Turf*. More information is available from FT-GA offices at 4065 University Blvd. North, Jacksonville, Fla. 32211.

Ky. Lists Crabgrass Controls

Four chemicals useful for crabgrass control in Kentucky have been recommended by scientists at the Kentucky Agricultural Experiment Station in Lexington. They should be applied in early April, or in late March.

Preemergence treatment is recommended for best control, according to James Herron, a station weed control researcher. The materials suggested are Bandane, Dacthal, Zytron, and calcium arsenate. These are active ingredients in several commercial mixtures, and are available in dry form for application with either a fertilizer spreader or a cyclone-type seeder.



Rotary Weed Cutter can be used on slopes and banks, has multiple power sources.

New Vandermolten Weed Cutter

A new machine to cut weeds on slopes and ditch banks, and under trees, hedges, etc., has been introduced by the Vandermolten Export Co.

Called the Tarpen-Flex weed cutter, the machine is attached to a flexible driveshaft of 12 or 15 feet so the unit is operable within a radius of 12 or 15 feet from the engine, which is built on wheels. Or the same flexible shaft can be attached to a power take-off shaft of a garden tractor.

Vandermolten also offers a mobile power unit, the Porta-Clipper knapsack engine, which has a 6-ft. flexible drive shaft. This unit, the company says, is ideal for working in wooded areas, on hilly terrain, on steep banks, etc.

The Rotary Weed Cutter has an 8-inch blade, turning 5000 rpm. It is said to cut anything from grass to heavy weeds, up to and including thin brush. It has underwater applications for aquatic weeds, the firm claims.

For heavy brush, Vandermolten has a Rotary Brush Cutter which cuts up to 3-inch wood.

For more information on these and other Vandermolten machines for weed and brush control, write Vandermolten Export Co., 378 Mountain Ave., North Caldwell, N.J.

**Next month in W&T
 Brush Control**

Set Hyacinth Control Meet For June 28 in Tallahassee

Weed controllers dedicated to the destruction of the waterhyacinth and other weeds which choke southern waters will converge on the Holiday Inn at Tallahassee, Fla., June 28-30, 1964, for the fourth annual meeting of the Hyacinth Control Society.

Herbert J. Friedman, president of Southern Mill Creek Products, and secretary-treasurer for the group, told *Weeds and Turf* recently that experts from Louisiana to the Carolinas will participate in the annual program.

New developments from research will be presented. Successes in controls this past year will be discussed along with the problems which cropped up along with the successes.

Those who wish to know more about the upcoming conference can get more information by writing to the local chairman, John W. Wood, Hyacinth Division, Florida Fish and Game Commission, Tallahassee, Fla.

Water-Soluble Hyvar Developed

A new soil sterilant herbicide that is water soluble for easy application, said to provide long-term weed control, has been developed by E. I. duPont de Nemours & Co.

Called "Hyvar" X-WS bromacil weedkiller, the new water-soluble powder is the second formulation of bromacil now being marketed by duPont for industrial weed control.

Since it is water soluble, duPont says, Hyvar X-WS offers several application advantages. A pound of product can be dissolved in a gallon of water through mechanical or hydraulic agitation. Once dissolved, no further agitation of the spray is needed. Solutions of the new water-soluble herbicide also have wide compatibility with other herbicides for combination treatments, duPont maintains.

For control of annual weeds and grasses, 5 to 10 lbs. of the product per acre is recommended. Many perennial species are controlled by 10 to 20 lbs.,



Low center of gravity and three agitators are features of the new Imperial Model Bowie Hydro-Mulcher.

Bowie's New Hydro-Mulcher Called Aid to Better Turf

One-step "hydro-mulching" made possible by the new Imperial Model of the Bowie Hydro-Mulcher provides turf managers with faster, better turf, according to spokesmen of the Bowie Machine Works, manufacturers of the machine.

The new unit carries 1500 gallons and incorporates extra mixing power (3 agitators are supplied) as well as lower center of gravity for the load, the company reports. The machine can spray, in one operation: (1) fertilizer; (2) seed or sprigs; (3)

while hard-to-control species such as Johnsongrass, Bermuda-grass, etc., require from 24 to 48 lbs. per acre.

DuPont says the new weedkiller is most effective when applied during or shortly before the period of most active growth. More details are available from the I & B Department, E. I. duPont de Nemours & Co., Wilmington 98, Del.

Herbicides Stay, Study Shows

Researchers at North Carolina State College, Raleigh, indicate that soil treated with certain preemergence herbicides may be mechanically cultivated without the once-feared loss of effectiveness of the chemical.

In fact, scientists believe that final analysis will show that stirring treated soil actually increases the effectiveness of some

mulching material such as all brands of paper fiber; and (4) moisture for carrying the mulch and for helping germination.

Each unit is supplied with a large complement of fire-type nozzles which permit long throws as well as closeup sprays, Bowie says. The new machine enables operators to plant large quantities of mixed slurries at a rate of one-half acre every 8 minutes, with sprays up to 200 feet.

More information will be sent to turfgrass management personnel who write the company at the Bowie, Texas address.

herbicides. "This discovery represents a major advance in the technology of using herbicides," Dr. R. P. Upchurch, associate professor of crop science, says. "Much research is now under way to explore its ultimate meaning."

Has pH Preference List for Turf

A list showing the pH preference of 19 popular lawn grasses is now available free of charge to turfgrass managers.

Sudbury Laboratory, producers of soil test kits, says the list is useful because some soils are acid, some alkaline, and it is necessary to know the pH range in order to plant, fertilize, and cultivate lawn grasses properly.

For a free list, write Sudbury Laboratory, Lab D, Sudbury, Mass.



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730 Delegates at Ohio Short Course Study Turf Diseases, Weed Control, Irrigation

A concise but detailed program for the annual Ohio Short Course for Arborists, Turf Management Specialists, Landscape Contractors, Garden Center Operators, and Nurserymen attracted a record 730 delegates to the Columbus Plaza Hotel in Columbus, Jan. 27-30.

A highlight of the yearly seminar was an address by Dr. Houston Couch, of Pennsylvania State University, on turfgrass diseases. Dr. Couch reminded delegates that although hard to recognize, *Helminthosporium* fungi cause more trouble than all other turf diseases combined.

The best control of all such ills is prevention. Dr. Couch listed the following fungicides as particularly effective when used in preventive maintenance: Actidione-Thiram; Dyrene; Maneb; Dithane M-45; Tersan OM; or Thimer.

Apply every 7-14 days from July through August for Zonate Eyespot and *Helminthosporium* Leaf Spot, the Pennsylvania expert suggested. All other diseases of this same group can be controlled with applications at the same intervals in April through June. Use manufacturers' suggested rates.

Dr. Robert W. Miller from Ohio State's Department of Agronomy discussed irrigation of turf and problems so involved.

Overwatering is a hazard, Dr. Miller warned, and results in exclusion of air from roots, while underwatering results in shallow rooted turf. Apply enough water to penetrate at least 6 inches or 12 inches in light textured soils each time the turf is watered.

Another Ohio agronomist, Dr. Edward Stroube, lectured the group on weed control practices. Annual grasses such as goosegrass, foxtails, and crabgrass succumb to preemergence applications of Zytron, Dacthal, Bandane, and Treflan, Dr. Stroube commented. The chloranes and arsenicals are sometimes erratic in preemergence use, although they do have a long

Meeting Dates



3rd Annual Florida Turf-Grass Trade Show, Hotel Seville, Miami Beach, April 30-May 2.

International Shade Tree Conference Western Chapter Meeting, Ben Franklin Hotel, Seattle, Wash., June 21-24.

Hyacinth Control Society Fourth Annual Meeting, Holiday Inn, Tallahassee, Fla., June 28-30.

American Society of Landscape Architects Annual Convention, Hotel Baker, Dallas, Tex., June 28-July 1.

American Association of Nurserymen Annual Convention, Statler-Hilton Hotel, Boston, Mass., July 19-22.

International Shade Tree Conference, Shamrock Hilton Hotel, Houston, Tex., August 15-21.

National Agricultural Chemicals Assn. Annual Convention, The Greenbrier, White Sulphur Springs, W.Va., Sept. 8-11.

Midwest Regional Turf Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.

Society of American Foresters Annual Meeting, Hilton Hotel, Denver, Colo., Sept. 27-30.

residual effect, he continued.

Seeding practices were analyzed by Dr. Kenneth Bader, also an OSU agronomist. The best time to sow seed is late summer or early fall, with spring a second choice, he commented. Some thought could be given to late fall or early winter seedings.

Dr. Bader suggested that turf managers roll the area lightly after seeding to establish good soil-seed contact.

Final speaker, Dr. Richard Davis, from the Ohio Agricultural Experiment Station in Wooster, examined turf fertilization techniques. Soil testing is the first step to correct fertilizer management, the scientist urged, whether one is seeding a new lawn or caring for an established one. Soil tests should be repeated every 3 to 4 years.

Dr. Davis concluded with a mention of the 1964 Ohio Lawn and Ornamental Days, open to all horticulturists and the public, which are to be held Sept. 15-16 in Columbus.

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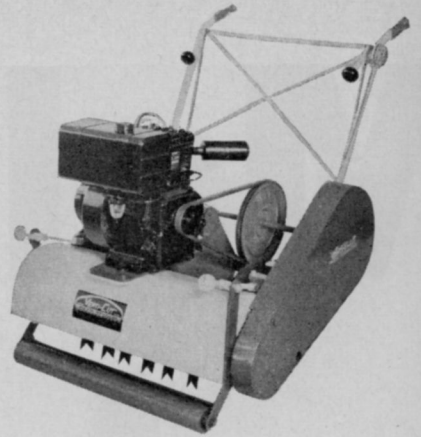
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Myers also makes a full line of sprayers with pump capacities from 2-50 GPM, pressures to 800 PSI, tank sizes from 12½ to 1,000 gallons. See your local Myers Sprayer Dealer for details.



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Praise Water-Soluble Diquat For General Home Weed Control

"Water-soluble Diquat is an effective contact herbicide for control of young annual weeds, and temporarily controls herbaceous perennials," according to J. B. McHenry in the January 1964 issue of the University of California's Ag Extension Service *Pest Control Review*.

Diquat is currently registered as a seed crop desiccant, a general weedkiller, and an aquatic herbicide. Action of Diquat is such that it is absorbed only through leaves. Since it is deactivated by contact with soil it cannot be absorbed by roots of desirable plants. By directing spray onto leaves of weeds under trees, around gardens, in patios, and on walks, selective control is attained.

Availability of the 2 lbs. of active cation per gallon is to professional applicators only. California Chemical Co. does not presently formulate a preparation for homeowner use.

California Extension Service

recommends the addition of 6 to 8 ounces of surfactant to each 100 gallons of spray mix to enhance the phytotoxic action of Diquat herbicide. The fact that Diquat is water soluble, odorless, and will not stain painted or masonry structures makes it desirable for use around homes, the report maintains.

Bark Beetle Fungi Fell Pines

Pine trees usually succumb after an attack by bark beetles only indirectly because of the beetles, according to Dr. M. H. Farrier, entomologist at the North Carolina State College, Raleigh.

Real culprit is the blue-stain fungus which both the southern pine beetle and the Ips engraver beetle carry. Even though the beetles may be killed after infesting a pine, the fungi they have carried plug the water-carrying vessels of the tree, and the tree dies from drought.

Only sure control for the blue-stain fungus, Dr. Farrier recommends, is adequate prevention before beetles strike.

New England Herbicide Workshop (from page 20)

more susceptible species, Dr. Ahrens further reported. Assuming a simazine residue of 1 lb. per acre, 100 lbs. of charcoal could be used to prevent the expected simazine injury when susceptible species are to be planted.

Final speaker on the program was Prof. Jay S. Koths who discussed herbicide usage in greenhouses. Principle use in this area is on the floor to control weeds and the pests that survive or build up in numbers on the weeds, the expert commented.

Only nonvolatile, long-lasting herbicides should be used for this purpose, he continued. These include monuron, diuron, neburon, simazine, and atrazine.

In accordance with the policy of rotating areas of interest in this New England Herbicide Workshop, there is a possibility that turf will be one of the subjects to be discussed next year, Professor Koths told *Weeds and Turf*.

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One Aphid Is Danger Sign

Discovery of a single aphid on ornamentals is an indication that spraying should begin immediately, according to William Hantsbarger, extension entomologist at Colorado State University, Fort Collins.

"Usually too many people wait too long," Hantsbarger points out. "When aphids and plant lice are so numerous that leaves of plants begin to curl, irreparable damage has already been done."

Aphids, or plant lice, feed on most plants, including annuals, perennials, shrubs, and trees. Either malathion or lindane may be used as a controlling spray, Hantsbarger reports. "Repeated spraying will probably be needed throughout the summer."



New, all-purpose 10-gallon power sprayer from Root-Lowell Corp. features 4-cycle, 2-hp. gasoline engine with recoil starter. Fully adjustable power spray gun attaches to a 3-nozzle hand boom for small trees, high shrubs, and dense plantings; an easily mounted 4-nozzle lawn boom is also available for wide-swath lawn spraying, the firm reports. For more information contact Root-Lowell Corp., 445 N. Lake Shore Dr., Chicago 11, Ill.

Henderson Reveals New Multi-Use Power Turf Maintenance Tool

A new 28-inch self-propelled power lawn tool which either mows, renovates, or sweeps (as separate operations or as one) is now available from Henderson Manufacturing Co.

Called the Henderson Contour 28 Turf-Tool, the machine possesses fingertip controls which adjust depth of cut and permit variations of travel speed for both mowing and renovating. Dual cutting blades are individually bolted to a patented hexagon tubular shaft. These cutting blades are accessible without tilting or lifting the machine.

Henderson says the dual cutting blades, which may be replaced on the job by the operator, offer the advantage of lighter weight, which reduces impact and consequently reduces machine damage and the chance of injury.

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Turf management specialists who want to know more about the new Henderson combination tool should write to E. P. Shapland, Henderson Manufacturing Co., 612 West Hessel Blvd., Champaign, Ill.

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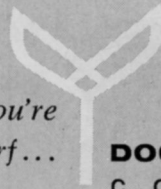
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A potassium salt formulation containing 2½ lbs. of MCPP per gallon. Made available through Fisons research in England. Developed especially for use on fine turf grasses where control of chickweed (common and mouse-ear), clover, and knotweed has heretofore been difficult to accomplish without injury to bent grasses, bluegrass, and fescues. Because of its safety features, it is slow-acting; full effects from treatments are not visible for about three weeks.

Also available — FISONS DSMA 100 AMA for crabgrass control as well as FISONS DSMA 100 for control of Dallis grass.

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60% Mercurous Chloride, 30% Mercuric Chloride. Suspension type fungicide based on combination of mercury chlorides for positive long-lasting control of Large Brown Patch, Dollar Spot, Snow Mold.

75% Thiram

FISONS TURF-TOX

Wettable powder 75% Thiram, a proven fungicide for the prevention and control of Brown Patch, Dollar Spot, Snow Mold, Fisons TURF-TOX may be safely mixed with mercury to your own specifications. Apply to prevent disease or to control it after it occurs.

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One convenient wettable powder formulation that eliminates the need for on-the-spot mixing. Fisons TURF-TOX MC combines the widely used turf fungicides, Thiram, Mercurous Chloride and Mercuric Chloride, for the prevention and control of Dollar Spot, Brown Patch, Copper Spot, and Snow Mold.

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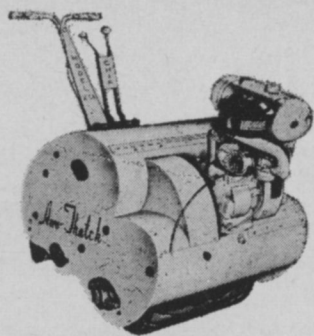
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Cornell Sells Color Photo Guide to Turf Problems

Twenty-four common turf problems, such as leaf spot disease, chinch bug damage, drought, and fertilizer injury, are presented in glossy color photos along with a written description of each condition in a handy pocket-sized guide, produced by Cornell University, called "Picture Clues to Lawn Troubles."

The booklet is written by Norman J. Smith, Nassau County Extension Agent, in collaboration with Professor John F. Cornman, Horticulture Department, Cornell University.

Although the booklet contains no specific recommendations for control or correction, general suggestions are made, and it is an excellent aid to one who may not be familiar with the overall looks of some of the lawn ills.

It costs 75 cents and can be obtained by writing either to the Mailing Room, Cornell University, Ithaca, New York, or the Nassau County Extension Service Association, Agricultural Department, 1565 Franklin Ave., Mineola, Long Island, New York.

New Bulletin Gives Aquatic Weed Control Specs for Ill.

Illinois State Department of Conservation recently published a booklet, "Aquatic Weeds, Their Identification and Methods of Control" by Albert C. Lopinot, Fishery Biologist.

This 47-page booklet discusses the case against aquatic weeds and various control methods of the past. Included also are instructions to determine areas to be treated, dosage needed, and application means.

Since identification is essential, the greater part of the booklet is turned over to plant drawings and descriptions of those weeds found in Illinois. A chart of recommended chemicals and dosages accompanies each species.

A copy may be obtained free by writing for Fishery Bulletin No. 4, to Division of Fisheries, Room 102 State Office Building, Springfield, Ill.

Trimmings

A fresh new crop. Turf maintenance companies or turfgrass supervisors need not fear that the burgeoning industry will be insufficiently manned in the years to come, we're prompted to comment after reflecting on February's International Turf-Grass Conference in Philadelphia. Conspicuously on hand were 50-plus blazer-clad, bright-eyed turf management students from the University of Massachusetts, down to Philadelphia to get an advance peek at the nature of their chosen jobs. Also in evidence was a flock of earnest student-scientists from Dr. Joe Duich's renowned turfgrass school at Pennsylvania State University. If the representation of these two schools alone is any indication, turf managers of the future will have benefitted from fine schooling, enthusiastic guidance, and some down-to-earth experience with practical aspects of the profession. We congratulate these two schools, and the others like them, on a fine job which will be a keystone in building America's turf industry to soaring new heights in the next decade!

* * *

Tarheel Titan. Each year the Southern Weed Conference has an essay contest, and we're informed that for the second year in a row, North Carolina State College has provided the winner. He's Horace Dean Skipper, whose efforts have been soundly commended with a \$500 scholarship to continue his graduate studies. Title of this titan's essay? "Career Opportunities in Studying Herbicide Residues." Quite a feather in the Tarheel school's already feathery cap.

* * *

Turf and surf. We've just learned that the turfgrass industry on the island of Oahu in Hawaii is a million-dollar-a-year industry, and turfgrass people there have just formed the Oahu Turfgrass Council which will seek to collect, preserve, and disseminate information on development and maintenance of turfgrasses. This is interesting news indeed, and we're wondering if first hand investigation of this phenomenon isn't in order. Perhaps some footloose readers would like to join us in the First Annual Weeds, Turf, and Surf Tour of Tantalizing Technology, for an on-the-spot look at turfgrass maintenance in our 50th State!

* * *

Let us spray. Down in Ft. Lauderdale, we hear, one Sydney Kirkpatrick has a going enterprise which encompasses power spraying, fertilizing, landscape service, and care of palm trees and shrubs. "Kirk" has a unique customer service which we think is worthy of passing on to other readers. He mails periodic news bulletins to his customers in which he outlines the biology of some common lawn pests and details how they're to be treated, at the same time reminding everyone that his company offers professional services for homeowners who don't want to trust themselves. "Let us spray," Kirk's flyer concludes. An effective combination of public education and salesmanship!

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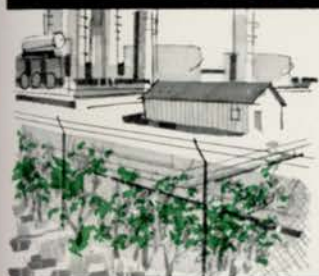
THE PROBLEM:
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THE ANSWER:
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weed killers provides effective,
low-cost control of weeds and
grasses for a whole season.



THE PROBLEM:
Deep-rooted perennial
weeds— morning glory,
leafy spurge, Canada
thistle and others.

THE ANSWER:
Easier control of noxious weeds
than ever before with TRYSBEN®
200 weed killer. Also
controls some woody plants.



THE PROBLEM:
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brush on plant sites,
roadsides, drainage
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THE ANSWER:
Economical control of brush with
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