Geigy herbicides produce dead weeds and new business

There are untapped profit opportunities for you in the field of chemical weed control. Geigy herbicides enable you to realize this potential because of product superiority: a single spray works through the entire season to control most annual broadleaf weeds and grasses.

Results the easy, economical way

With Atrazine 80W or Simazine 80W, you give your clients weed control they can count on. You make one application of Atrazine before weeds are up or shortly thereafter, or spray Simazine before weeds break ground. Rainfall carries either herbicide to the weed root zone where it is picked up by germinating weeds. Weeds die soon after emergence. And, as later weeds germinate they are killed as well. No continuing control problem . . . no repeat sprays for you to put on.

Every job an advertisement for you

At every type of installation where weeds are a problem—industrial, commercial, institutional, roadside—the results of your work are seen and noticed. New business will be referred to you, as the weeds you have sprayed continue to be controlled by Geigy herbicides.

Safety added to effectiveness

Geigy herbicides, used according to label directions, deliver outstanding weed control, coupled with safety to humans and animals. Nonirritating to the skin and noncorrosive to equipment, Atrazine and Simazine can be removed from tanks and lines by flushing with plain water.

Valued service

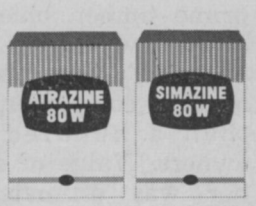
Weed control, like pest control, is a professional specialty, requiring "know-how" in choice of material as well as application technique. Select the right Geigy herbicide to solve each weed control problem, and you perform a valued individual and community service . . . one which will bring you profitable returns. For full details on highly effective weed control write to:

Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation, Saw Mill River Road, Ardsley, N. Y.

Geigy

CREATORS OF CHEMICALS FOR MODERN AGRICULTURE

Atrazine | Simazine



air STRIKING the Hemlock

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

By TOM BURRIER

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.

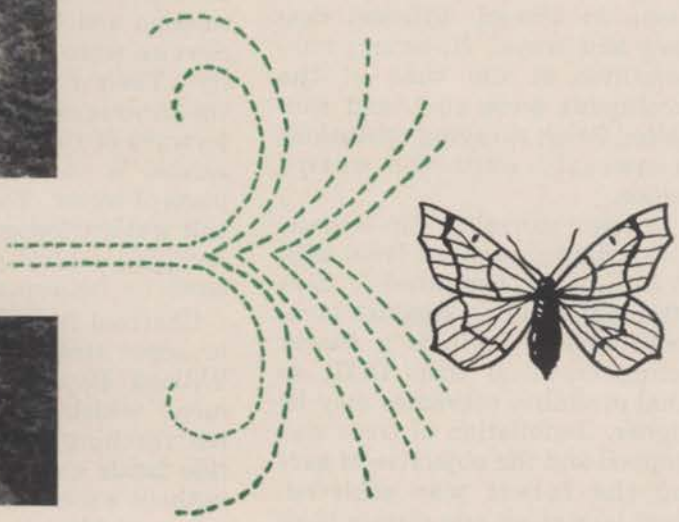
At stake was 71,000 acres of prime timber, chiefly hemlock. It was owned by U. S. and State agencies, three large private timber companies, and more than a hundred small-plot owners. Value of standing timber was estimated at $121\frac{1}{2}$ million; the end product value of the huge tract at $104 million.

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 $1\frac{1}{2}$" 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 concensus 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 administrators 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 protested 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.

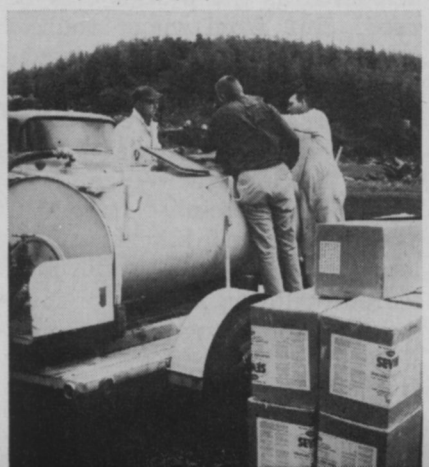
In the project's first spraying, some 12,000 acres not draining into Willapa Bay were treated with DDT. Numerous field checks seven days later showed 99.7% looper mortality. Preliminary figure for the Phosphamidon experimental application, on 2,250 acres, indicated a 75.9% looper kill. These figures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

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



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 ½ 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.

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

By DR. ROBERT W. SCHERY
Director, The Lawn Institute
Marysville, Ohio

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 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 haygrasses 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).

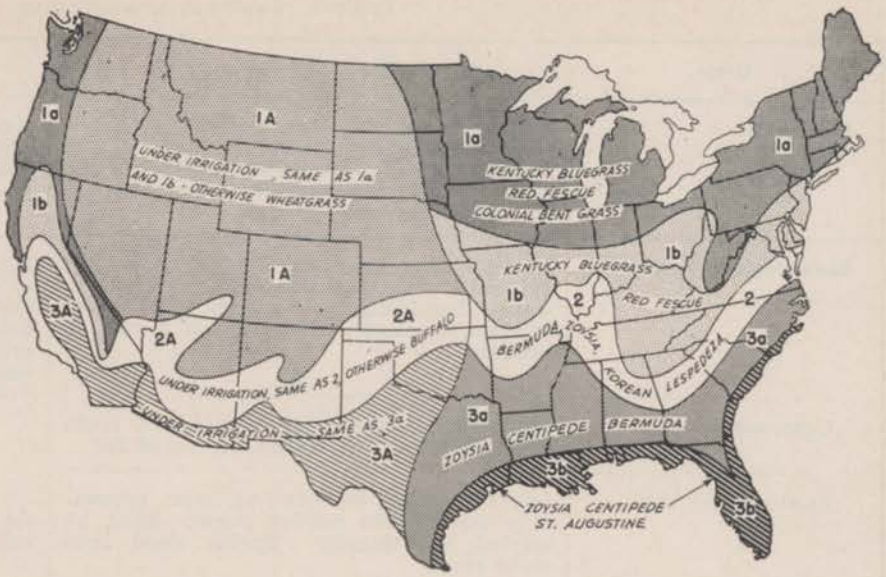
It is not surprising, then, that

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 course 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); **Berumda,** *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 phenoxys 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 considerately 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.

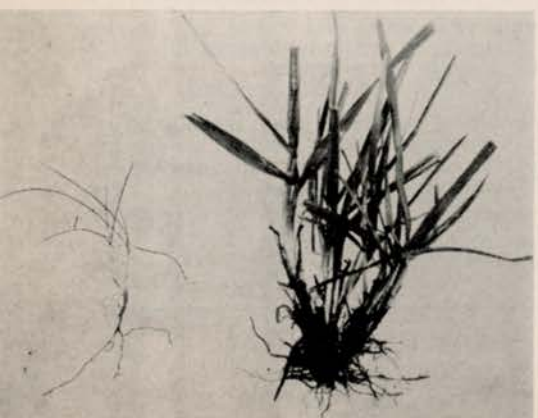
Probably the easiest way to

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, phenoxys 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.
Penncross	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 phenoxys, 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 (Helminthosporium), 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 *(Poa trivialis)*	For damp shade. A rather delicate species without wear-resistance, similar to bentgrasses.	Limited weed invasion. Treat more carefully than Kentucky bluegrass, about as considerately as bentgrass.
Fescues	Extremely rugged and drought-resistant.	About as with Kentucky bluegrass.
Fine fescues (Chewings, Creeping red, Illahee, Fennlawn, 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 mostest." 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)