

Improve your maintenance game

With the right clubs, a golfer can cut strokes from his game. And add power to his swing.

With the right maintenance products, a caretaker can improve his performance, too.

Dolge makes everything you need to achieve the best results, outdoors and in. With less labor. At less cost.

For example: *Tote* can kill any weed it hits; is non-poisonous. *E.W.T.-Plus* is a selective weed-killer. *Penetrate* improves soil porosity. *Lake Dye* colors ponds blue. *Anti-Dessicant* protects

turf from drought and snow damage. *Boost* detergent-degreaser cleans machinery. Dolge also supplies famous fungicides.

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Outdoors & In—Dolge. The Complete Caretaker

6 Stroke-Savers from DOLGE

1 TOTE non-poisonous weed killer for use where no growth whatsoever is wanted. Kills annuals, biennials, perennials on parking lots, drives, walks, gutters, courts. Finishes roots, stops seeds, sterilizes soil. 40 gallons of Tote in 60 or more of water cover a whole acre.

2 E.W.T.-PLUS selective weed-killer finishes broad-leaved weeds—kills dandelions, plantain, mouse-eared chickweed, even poison ivy—does not harm good grasses. Amine formulation: non-volatile; does not “jump” to flower beds or shrubbery.

3 PENETRATE natural, organic soil improver. Works through compacted soil; lets air, water and nutrients go deeper. Promotes deeper, stronger root growth. Encourages vigorous, beautiful turf, shrubs, trees. Prevents soil erosion and puddling of surface water. Speeds germination of wanted vegetation.

4 LAKE DYE a safe, non-toxic blue water dye for lakes, ponds, water hazards. Colors to shade of blue you desire. Apply 2 pounds to the acre, 4 to 5 feet deep. Harmless to wild life—swans, ducks, geese, fish, frogs. Harmless to grass too. Compatible with fungicides, insecticides, turf chemicals.

5 DOLGE ANTI-DESSICANT protects turf grasses and broad leaved evergreens against drought and snow. Allows plants to breathe, yet prevents loss through water transpiration. Guards against summer scald and plant shock, too.

6 BOOST detergent-degreaser for machinery. Spray or mop it on mowers, tractors, carts; hose off: clean! In the clubhouse, Boost is a real handyman for extra-heavy cleaning jobs. Great on concrete floors.

Write for your free sample copy of CLEANUP, Dolge's indispensable Bi-Monthly source of product and service news about the industry.

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GROUND BOOM



AERIAL



INDUSTRIAL

Foamspray's foaming adjuvant, for herbicides and pesticides, aids in reducing spray drift and evaporation. Provides better coverage with accurate placement of materials.

IN ADDITION:

Foamspray will *LOAN* you aerial and ground boom foaming nozzles. Easy to install on all conventional sprayers capable of 40 PSI pressure. These nozzles were developed specifically for Foamspray foaming adjuvant.

See your nearest Foamspray Products distributor, or mail in the coupon below, for complete details.

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The Public Relations of Public Spraying

By Jim Hansen

The Dow Chemical Company

SPRAYING SEEMS to have become a hazardous occupation. Not in the usual physical sense, of course, but with the 1972 spray season just starting, applicators who contract for a routine spray job along a highway or power line can set off enough controversy to provide some real headaches. How to avoid these headaches and how to ease the pain after they start has become a subject well worth exploring.

People today are concerned with anything that they think may have some adverse effect on the environment. Often that concern is almost totally uniformed and sometimes equally irrational, but it is real. The concern may be fanned by one of our current crop of "instant ecologists" who for reasons of personal advantage need to maintain a "tiltable windmill." Rights-of-way spray jobs or any spray work on public land fills the bill. It is visible. It comes under the domain of the "establishment," and it can be influenced by public pressure without trampling on the rights of the "little man."

This climate adds an element of risk to any spray operation that must be taken into account if normal maintenance is to continue.

(continued on page 23)



THE FORD DIFFERENCE

MAINTENANCE ADVANTAGES
THAT GIVE YOU LESS
DOWNTIME, MORE TIME
ON THE JOB.



Fact: Ford industrial tractors call for far less maintenance than some competitive rigs.

Look at the operator's manuals. Some manufacturers recommend oil changes as frequently as every 100 hours. Ford gives you a whopping edge: 300 hours is our recommended interval between oil changes.* Our

recommended interval between transmission oil changes is 1,200 hours. That's 200 hours longer than some other rigs.

Look at this advantage: some tractors call for daily greasing. Ford recommends greasing at intervals of 50 hours.

Ford maintenance advantages. They mean less

time stopped for lubrication—more jobs done at the end of the day. See all the other Ford differences that *cut downtime* at your nearest Ford tractor dealer!

NUMBER ONE ON WHEELS
FORD TRACTOR

*Maintenance times are quoted under normal operating conditions. Adverse conditions may dictate more frequent maintenance.

Your Ford industrial tractor and equipment dealer is listed in the Yellow Pages under "Tractors" or "Construction-Equipment." See him for information on how to buy, lease, rent or finance.



For More Details Circle (152) on Reply Card



This is a field of certified Manhattan perennial ryegrass grown by Carey Strome, Junction City, Oregon. Notice the high uniformity of plant type and freedom of annual ryegrass. Good seed production starts with perennial ryegrass fields such as this. Photo is by Dr. C. Reed Funk.

FLUORESCENCE — NATURE'S HEREDITARY TRADEMARK

Ultraviolet Light Helps Decode Ryegrass Species

EDITOR'S NOTE: Five authors interested in the importance of perennial ryegrass to the turfgrass industry have written this article. They are: Richard H. Bailey, vice-president, Turf-Seed, Inc., Hubbard, Oregon; Dr. Henry W. Indyk, specialist in turfgrass management, Cooperative Extension Service, Rutgers University, New Brunswick, N. J.; Dr. C. Reed Funk, research professor, turfgrass breeding, College of Agriculture and Environmental Science, Rutgers University, New Brunswick, N. J.; E. E. Martin, director of the seed laboratory, Oregon State University, Corvallis, Oregon; C. R. Edwards, chief of the seed branch, Consumer and Marketing Service, U.S. Department of Agriculture.

The information presented here will familiarize the customer with ryegrass species so that he may have a better knowledge of the product he is buying.

The first section is by Richard H. Bailey.

Contamination of perennial ryegrass seed by common annual ryegrass has become an increasing problem with ryegrass breeders, producers and the customer. Although both are from the genus *Lolium*, *L. perenne*, perennial or English ryegrass is the fineleaved shorter growing, darker green, more dense, turf-type ryegrass when compared to *L. multiflorum* Lam., annual or Italian ryegrass which is generally, light green, fast growing, erect, hay or forage type.

The main concern of turf breeders and producers of the turf-type perennial ryegrass seed is that contamination from *L. multiflorum* does not become an uncontrollable problem. Few customers would want to seed a perennial ryegrass and later discover it contaminated with annual ryegrass.

While it has been known that perennial ryegrass has flat leaves in the bud and florets which are not awned, and annual ryegrass has rolled leaves in the bud and awned florets, the breakthrough in seedling differentiation comes in exposing seedling roots to black or ultraviolet light. *L. perenne* or perennial ryegrass does not reflect the fluorescence character. *L. multiflorum* exhibits fluorescence.

Some perennial types exhibit a degree or low percentage of fluorescence. This is the case where hybridization between *L. multiflorum* and *L. perenne* has taken place. Linn Perennial Ryegrass is such a variety. Somewhere in its genetic development there was a hybrid as one or more of the parent clones, which thus exhibited a fluorescence level which is still present in the variety.

The authors will examine fluorescence as related to: ryegrass recommendations, ryegrass breeding, ryegrass seed production and the Federal Seed Act.

Fluorescence As Related To Ryegrass Recommendations

By Dr. Henry W. Indyk

The turfgrass industry is experiencing a very exciting period in which many new turfgrass varieties are being developed by plant breeders and released to the seed trade for production and distribution. The recent development and availability of turf-type ryegrass varieties represents a major breakthrough in the improvement of ryegrasses. As a

(continued on page 26)

Your first step to healthier turf



1

Spring is the time to take it

Leaf Spot problems caused by overwintering spores of *Helminthosporium* spp. can spoil the health and beauty of your turf this spring. So can Rust and *Rhizoctonia*.

But if you apply TERSAN® LSR now, you can break the *Helminthosporium* spp. cycle before it becomes a costly problem. You stop Leaf Spot before the "melting" or "fading" out stage. And Rust and *Rhizoctonia* don't get a chance to damage your turf.

The application of TERSAN LSR to tees, greens and fairways in the spring is the first step in the Du Pont TERSAN 1-2-3 Disease Control Program. The program that prevents or controls all major turf diseases on all common grasses throughout the entire year.

The TERSAN 1-2-3 Disease Control Program is effective, economical and entirely non-mercurial. It has been proven by hundreds of professional turf men throughout the country.

For complete details on the program and a supply of TERSAN fungicides, see or call your golf course supplier today.

With any chemical, follow labeling instructions and warnings carefully.



TURF PRODUCTS

Slow Release Herbicides

A New View In Aquatic Weed Control

By **N. F. Cardarelli**
Chief Scientist
Creative Biological Laboratory
Norton, Ohio

AQUATIC weed control relies primarily upon the chemical treatment of the water course. Plant mortality depends upon both the amount of herbicide applied and the exposure time. Usually exposure times are small, several days perhaps, and thus the amount of the chemical used must be relatively large. Natural factors, such as reaction of the control agent with the mineral content of the water, solar radiation, dilution by incoming waters and absorption by soil particles and by organic matter detoxifies the control agent. Since a quick kill is essential massive amounts of the herbicide are uti-

lized, and the target plant succumbs through an *acute* intoxication method.

Even the safest of herbicides will affect many non-target members of the biological community; fish certainly and small organisms in the food chain; perhaps birds and mammals as well. If we can reduce the total amount of herbicide needed while achieving the same degree of control, unwanted environmental effects will be lessened. The ecologists are questioning the use of ULV insecticides used at a few ounces or less per acre and we in weed control are applying pounds per acre!

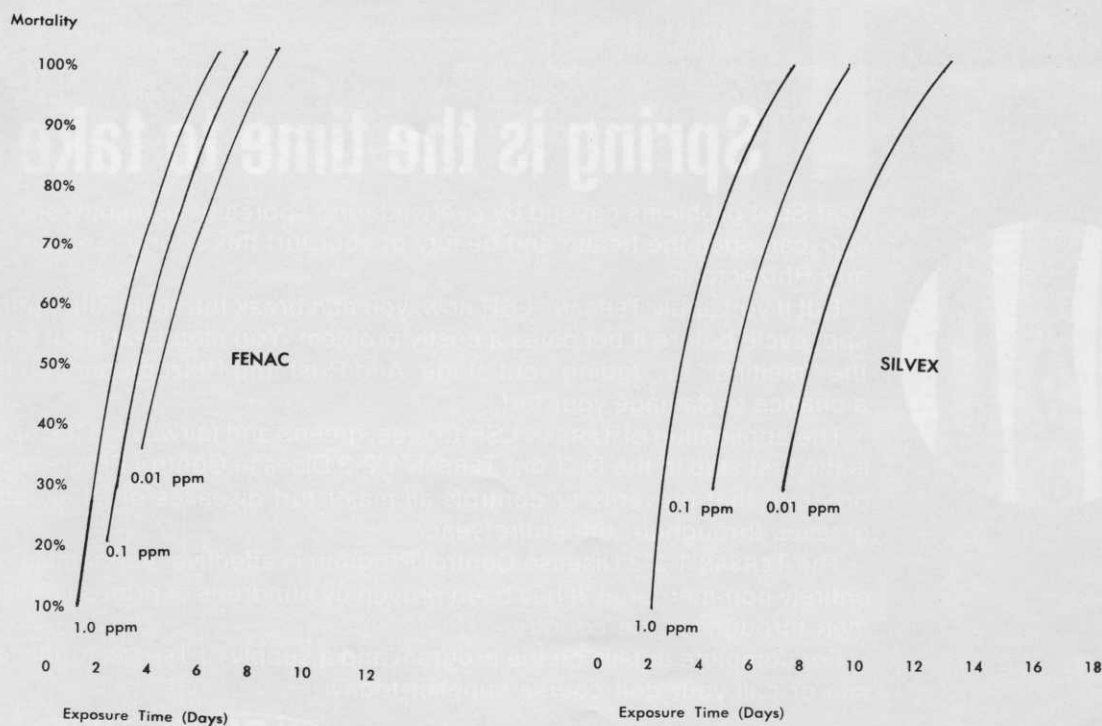
Now what can we do to satisfy

our detractors (if that is possible) and perhaps help ourselves economically at the same time?

At the Creative Biology Laboratory we are exploiting three interwoven concepts that promise economy, long term control, and much less environmental contamination. This work, sponsored by the U.S. Army Corps of Engineers, is based upon the slow release of a minute amount of a non-persistent control agent in the growth area (phytozone) of the target; such release to occur over a long period of time. Rather than destroy the pest through *acute* intoxication which re-

(continued on page 36)

FIGURE 1: Chronic Effect of Herbicides on Eurasian Watermilfoil



Eptam[®]: keeps sand traps neat and clean

Selective Herbicide

The sure, easy way to keep weeds and grass out of sand traps is to use economical Eptam granular herbicide. It saves hours of hoeing and saves a repeat application of post-emergence herbicides. It doesn't injure turf when sand is blasted onto the grass.

Spread Eptam, rake it in sand and water it in lightly and the job is done. You'll keep out more than 30 kinds of weeds for sure. Eptam controls many pestiferous plants, including nutgrass, quackgrass, chickweed, crabgrass, barnyardgrass, pigweed, purslane, foxtail and many others.

Eptam granular formulation	Rate* per 1,000 sq. ft.	
	Annual weeds	Nutgrass, quackgrass
5-G	2.75 lbs.	5.5 lbs.
2.3-G	6.5 lbs.	13.0 lbs.

*For granular applicator settings for one or two time applications per year, see Stauffer for details.

Biodegradable Eptam provides long-lasting weed control without injurious soil residue. Use it once or twice a year. See your local supplier now for Eptam. Stauffer Chemical Company, Agricultural Chemical Division, Westport, CT 06880.

Eptam[®] from



Turfgrass Retardation With Chemicals

By D. M. Elkins
Associate Professor
Plant Industries
Southern Illinois University
Carbondale, Ill.



D. M. Elkins, associate professor, and Ted Kitowski, graduate assistant, compare Kentucky bluegrass sprayed with a growth retardant (right) and an untreated control.

THE USE of chemical growth retardants on turfgrasses offers a number of exciting possibilities in the not too distant future. These chemicals could be used widely for both agricultural and non-agricultural purposes. Good chemical growth retardation of grasses have these possibilities:

(a) roadbank stabilization of long stretches of the interstate highway system — good chemicals have the potential to reduce overall costs of maintenance, making wide-

spread use of retardants feasible

- (b) retardation of grass growth in parks and recreation areas, "short roughs on golf courses, and vegetation on grounds of industrial plants, airfields, cemeteries and similar areas
- (c) reduction of grass growth in lawns of homeowners — this would be useful throughout the peak periods of grass growth, but would be a particular asset when the home-
- (continued on page 30)*

Table 1. Height of Kentucky bluegrass,¹ color ratings, and dry matter yield as influenced by growth retardant treatments.

Treatment	Rate (lb/A)	Grass Height (cm)		Color Rating ²			Dry Matter Yield
		14	No. Days After Treatment		19	49	g/44 sq. ft.
			28	42			
Untreated control		9.4	10.3	11.8	9	9	363
MON-820 ³	1	6.5	7.0	9.0	8	8.5	168
MON-820	2	6.0	6.1	6.8	7	7	125
MON-820	3	6.1	6.0	7.1	7	8	137
MON-820	4	6.5	6.0	7.2	7.5	7	132
Slo-Gro ⁴	1	8.2	8.9	10.2	8.5	8.5	304
Slo-Gro	2	8.2	8.4	9.9	8	8	256
Slo-Gro	3	7.3	7.4	9.5	8	8	237
Slo-Gro	4	7.9	7.4	9.4	8	8	218

¹ Low nitrogen level plots, Adequate P and K supplied but no N applied during growing season

² 0 = dead, 10 = best color

³ Experimental compounds from Monsanto Company

⁴ Maleic hydrazide formulation manufactured by Uniroyal Chemical

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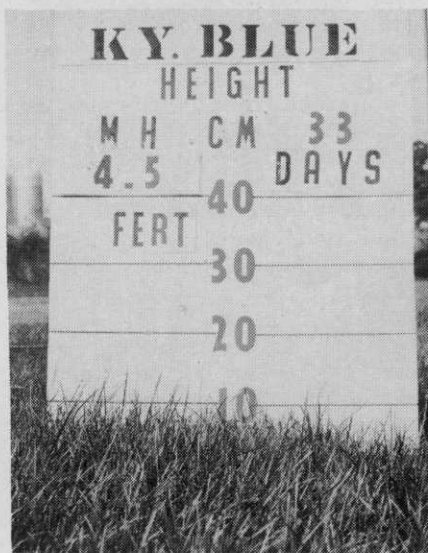
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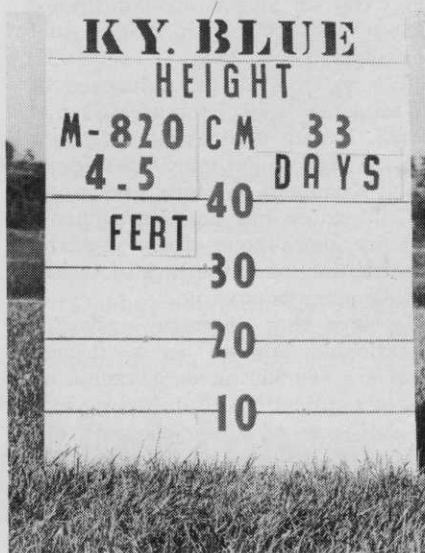
**ART EDWARDS
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Untreated control plot of Kentucky bluegrass. The three photos here were taken 33 days after grass was mowed to an initial height of 5 cm and sprayed.



Plot sprayed with 4 lbs./A of Slo-Gro, a maleic hydrazide formulation.



Plot sprayed with 4 lbs./A of MON-820, an experimental chemical.

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A light-duty rotary cutter that's built to last . . . is our secret to making small jobs more profitable, year after year. Both the six-foot Saturn VI and the five-foot Saturn V give you continued savings throughout the life of the cutter in the form of lower operating costs . . . and minimum maintenance and downtime.

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A rear view of the injection rig crossing a fairway. Tractor speed is set at six miles per hour. Note the cuts made by the machine.

FLORIDA APPLICATOR SAVES OWNER \$45/ACRE

Injection System Keeps Nematodes In Check

A CUSTOM applicator in Orlando, Florida is injecting a nematicide in large turf areas at a cheaper cost than the price of the same chemical formerly used as a soil-drench.

Jack Russell, owner Soil Fumigants Inc., and his son John II, have applied Nemagon on 15 golf courses totalling approximately 500 acres this past summer in Florida with excellent results.

"On large turf areas we have been charging \$50 an acre for material and application," Russell says. "This is figured as \$25 for material, \$15-\$20 for overhead and 10-12% net profit."

Russell, who has been selling nematicides for many years, says that costs are variable. It's possible that costs in the future for treating may be cut even more.

"New and more efficient machinery could be a factor in reducing this cost. We are now developing a new

injection unit that if successful, should be much more efficient than the coulter and shank unit we are now using," Russell comments.

He said Nemagon applied with soil injection results in a deeper rooted and healthier turf which requires less irrigation and less fertilization. It suffers less from winter kill than infected turf.

"Also, a healthy turf free of nematodes will flourish to the point of crowding out most weeds, greatly reducing the need for herbicide application," Russell says.

In 1969, Dr. Vernon Perry and associates in cooperation with Shell Chemical Co. and the Gainesville Country Club, applied liquid Nemagon in fairway turf plots using a simplified two shank tractor drawn applicator with gravity feed.

The tool consisted of coulters set 12 inches apart to cut the sod fol-

lowed by thin shanks to further open the soil to an average depth of four inches.

A delivery tube was attached to the back of each shank to permit the metered Nemagon to dribble into the cut to the four inch depth. A packer wheel or a fairway mower followed to seal the cut. Sometimes both were used.

Afterwards, a light sprinkling of water from the irrigation system helped insure there would be practically no loss of chemicals.

"Results from these tests indicated not only that the injected fumigant was far more effective than the drench application, but also that a much lower dosage of active Nemagon could be used, thus lowering the cost of application," says this businessman.

Russell further explains that preliminary data from Dr. Perry's tests indicated that about 20-25 pounds of actual Nemagon would give adequate nematode control for 12 to 24 months for established turf on sandy soils.

Using results from Perry's plots as a guide for dosage and methods, Russell developed a larger commercial rig to inject the chemical.

The first injecting unit had eight coulters and shanks set 12 inches apart on a heavy tool bar. Behind each shank was a heavy packing wheel to seal the cut.

"We soon learned that with eight shanks we could not adequately penetrate the soil so we cut back to six shanks and added 1,000 pounds of weight to the rig, Russell says. "This gave us the turf penetration needed; but we had to go to a heavier tractor to handle the weight."

Large balloon tires replaced conventional bar treads. Russell found he could operate over soft fairways and even on slopes around greens and across tees with minor turf markings.

"We inject at a ground speed of six miles an hour. Pressure is set at 40 psi. Nozzle orifices of sufficient size are used to deliver 25 pounds of actual Nemagon per acre," he says.

"Calibration has been so accurate that we have been using material consumption as a method of determining acreage covered."

He says that chemical costs for nematicides applied as a drench often are \$60-\$80 an acre excluding cost of application. By injecting into the soil, cost of materials with excellent results has been reduced to \$25 an acre.

The high investment for equipment—\$10,000 to \$12,000 is usually prohibitive to the superintendent

(continued on page 44)