

THE AMERICAN LAWN APPLICATOR

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Tom Mascaro
Turfgrass Products
P.O. Box 610366
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14 inch crabgrass plant

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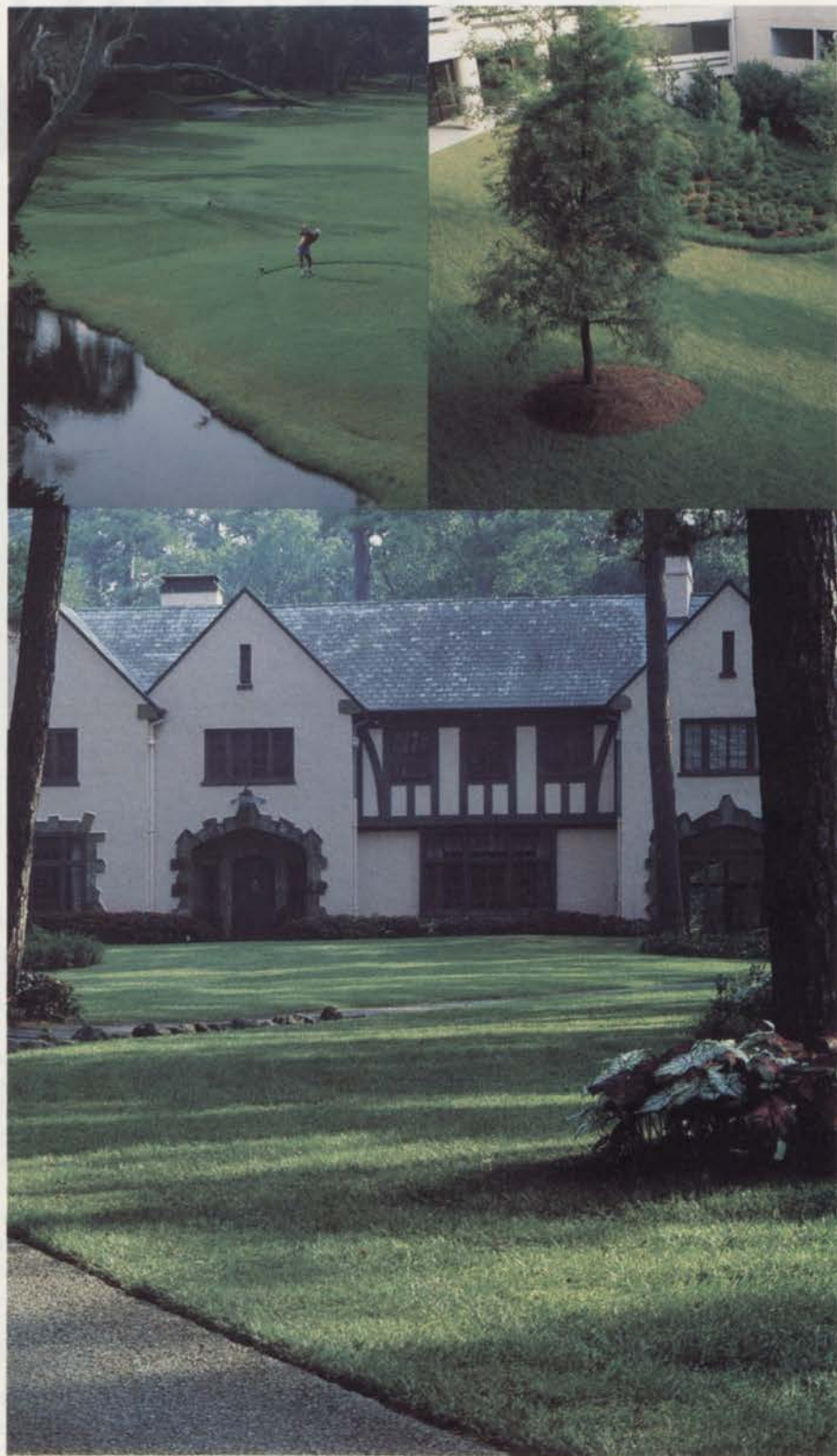
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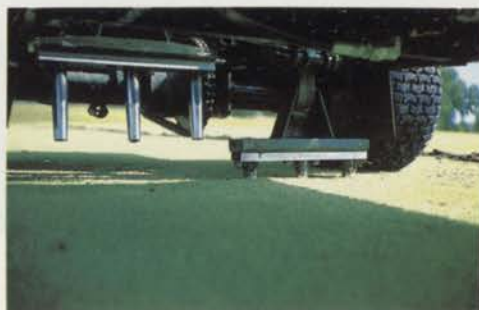
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Preemergent Weed Control

by R. P. Freeborg, Purdue University



Dr. Ray Freeborg received his PhD from Purdue University where he developed a soil test procedure for arsenic analysis. Since then he has been actively involved in turf management, Department of Agronomy, in research, teaching and extension.

*He received his Master's Degree from Washington University, Henry Shaw School of Botany, working on the allelopathic potential of *Zoysia* sp. His BS in Agronomy was in Turf Management at Purdue University.*

In the concept of preemergent weed control, the term "pre-emergent" refers to control prior to emergence or evidence of plant growth above the soil surface. The application of a herbicide before plant emergence is the major consideration. Control is obtained as the seed germinates and begins to develop its primary

root system or as emergence of the first leaf occurs. Depending upon the herbicide used, control is obtained either through root uptake or through absorption by the first leaf or shoot.

Success in this method of weed control is dependent upon proper timing of application before emergence and uniformity of application upon the soil surface. The preemergent herbicides currently available give good

control when proper application procedure and sound turf management prevail, as shown in Figure 1.

The picture, Figure 2, of one crabgrass plant, 14 inches across after a summer's growth, illustrates the unsightly problem that can occur if application is not thorough.

As previously noted, good turf management practices are necessary for an effective preemergent control pro-



Figure 1: Good preemergence weed control is shown in these two pictures.





Figure 2: Crabgrass plant 14" in diameter.

gram. A healthy, dense turf without excess thatch complements a preemergent herbicide, whereas a thin stand of turf, where the potential for weed germination is optimum, will place undue demands on the herbicide.

Generally, when preemergent weed control is discussed in the turf industry, it is in reference to the selective control of annual grasses in a perennial grass turf. In the future we should expect to see newer preemergent herbicides that will selectively prevent growth of annual broadleaf weeds in perennial grasses as well. A current example is that of Dacthal as a preemergent control in turf for Spotted or Prostrate Spurge (*Euphorbia maculata*, *E. Supina*). There is also evidence that bensulide (Betasan, Presan, Lescosan, etc.) can function as a pre-emergent control of Redroot Pigweed, *Amaranthus retroflexis*; Lambsquarters, *Chenopodium album*; Shepherds-purse, *Capsella Bursa-pastoris*, and Deadnettle (Henbit), *Lamium sp.*

Once the preemergent barrier has been established it is important that the soil surface not be disturbed. Slicing to plant seed, coring, aeration, and vertical thinning should not be done following application.

Benfin (Balan), when incorporated into the soil, also gives control of Carpetweed, *Mollugo verticillate*; Chickweed, *Stellaria media*; Knotweed, *Polygonum aviculare*; and Purslane, *Portulaca oleracea*.

This indicates that there is a potential for preemergent annual broadleaf weed control in turf. The herbicides now in use can bring about either a reduction in broadleaf weed population or a reduction in the weed's tendency to compete with the perennial turf. A major objective in current research continues to be the development of a pre-emergent herbicide for annual broadleaf weed control.

When we look at the efficacy of preemergent herbicides, one of the major concerns is that of its residual activity in the soil. There are a number of factors that influence the disappearance or degradation in the soil. These include volatilization, degradation by ultraviolet light, microbial decomposition and chemical decomposition. The relative importance of each of these factors is influenced by soil type, moisture content, temperature, microflora, and method of application.

The soil residual of DCPA, Dacthal

is greatly influenced by higher soil temperatures and moisture as these determine the rate of chemical breakdown. For example, under controlled conditions, the half-life of Dacthal at 90°F was 105 days; at 70°F, 155 days with no significant breakdown at 50°F. As Dacthal has also been shown to serve as a source of carbon for soil microbes, the soil microbial population can also contribute to its breakdown.

The term half-life, refers to the time required for breakdown and degradation of one-half of the herbicide applied. At this time a threshold concentration or level is reached where late germinating seedlings may not be controlled. Then it becomes necessary to apply additional herbicide to reestablish an adequate control level. For example, Dacthal W-75 applied at the recommended rate (14 lbs. formulation

There is a potential for preemergent annual broadleaf weed control in turf

or 10.5 lbs. 18/A) will usually provide effective season-long control of crabgrass and goosegrass in the northern states. In these areas the half-life may be 90-100 days. However, microbial activity is increased and the half-life of Dacthal decreased by high moisture and warm soil temperatures which encourage increased microbial activity. Under warm moist conditions, the half-life may be as short as 45 to 60 days. When this occurs, it may be necessary to apply a second half rate application.

Studies on the loss of benfin, Balan, from soil surfaces have established volatilization as an important source of herbicide loss. The great-

Preemergent Weed Control

est rate of loss from volatilization occurs during the first few hours of application. High soil temperatures increase the rate of loss. Balan is also degraded by ultraviolet light. Losses through volatilization and photodecomposition are minimized with the granular formulations. Balan is strongly adsorbed by the soil and is extremely resistant to movement by water. If heavy rainfall occurs, Balan is not leached from the weed seed germination zone. Organic matter in the soil is the most important factor in determining the rate of Balan required for seed control. Adsorption on the clay fractions of the soil is of less importance. Under normal conditions, recommended application rates give 120- to 150-day weed control. This will vary depending on the soil type, weather conditions and rainfall during this period. Residual activity may vary, and under extreme weather conditions may also require the application of a half rate to maintain adequate season-long control.

The bensulide includes the products Betasan, Presan, Lescosan, etc. Residual is influenced by clay soils and soils high in organic matter (35% or more clay; 10% or more organic matter). Residual activity is prolonged in alkaline soils where the pH is 7 or higher. It is also dependent upon the rate of water percolation through the soil. The faster the percolation rate, the shorter will be the residual activity. Therefore, in pure sand, the residual activity may last only 40-55 days, whereas clay or high organic soil residual activity may last 180 days or more.

Siduron, product name Tupersan, is a urea herbicide used as a preemergent annual grass control. Siduron is most effective as a selective preemergent annual grass control when used in conjunction with a new spring seeding of perennial grasses. Selective control of the annual weedy grass occurs without damage to or inhibition of the perennial grasses. In general, the urea herbicides, including Tupersan, are of low water solubility. They are readily absorbed on clay and resist leaching. At rates applied for selective weed control they tend to remain in the upper one inch soil layer.

Table 1. Preemergent Crabgrass Control—1982.
Applications on 27 April, 10 June (43 days repeat)¹ After Initial Application.

Treatment	Rate lbs. ai/A	% Control 19 July 1982
*Dacthal (75WP)	10.5 + 7.5 ¹	100a
*Dacthal (75WP)	10.5 + 5.2	95 abc
*Pendimethalin (EC)	3.0 + 1.5	95 abc
*Pendimethalin (EC)	1.5 + 1.5	93 abcde
*Dacthal (75WP)	7.5	92 abcde
*18-5-9 + Balan	3.	92 abcde
*Urea/Balan (Prill)	2.	92 abcde
*Pendimethalin	6.	90 abcdef
*Devrinol (50WP)	6.	87 abcdefg
*Devrinol (5G)	4.	87 abcdefg
*Urea/Balan (Prill)	4.	87 abcdefg
*Pendimethalin (EC)	3.	83 abcdefgh
*Devrinol (50WP)	2.	83 abcdefgh
*Devrinol (50WP)	4.	80 abcdefghij
*Devrinol (5G)	6.	80 abcdefghij
*Ronstar (GR)	4.	77 abcdefghijk
*Dacthal (6F)	10.5 + 7.5 ¹	75 abcdefghijk
*Dacthal (6F)	10.5	73 abcdefghijkl
*18-5-9 + Benefin (GR)	1.5	73 abcdefghijkl
*Dacthal (6F)	10.5 + 5.25 ¹	72 abcdefghijklm
*Devrinol (5GR)	2.	68 abcdefghijklmn
*Presan (EC)	12.5	67 abcdefghijklmn
*Ronstar (GR)	3.	67 abcdefghijklmn
*Dacthal (75WP)	10.5	65 abcdefghijklmn
*19-4-9 + Bensulide	7.5	63 abcdefghijklmn
*Ronstar (2GR)	2.	63 abcdefghijklmn
*Devrinol (5GR)	1.	60 abcdefghijklmno
*Dacthal (6F)	7.5	53 defghijklmnop
*Balan (GR)	2 + 1.5 ¹	33 lmnop
*Balan (GR)	2.	20 op
*Control		17 p
Grand Mean	32.3	
C.V.	60.8%	

¹Averages spanned by the same letter are not significantly different using Duncan's "New" Multiple Range Test (5%).

Standard error of the mean = 11.3259

Error mean square = 384.831

Degrees of freedom = 158

Interpretation of data should include evaluation of the letters following each number. If a number is followed by the same letter, there is no significant difference in the amount of crabgrass control. For example, all numbers with an "A" following are not significantly different.

Table 2. Preemergent Crabgrass Control— 1983.
Applications on 10 May, 10 June¹ and 15 July².

Treatment	Rate Lbs. ai/A	% Control 13 July 1983
UC77892 (80W)	7	100 a
DCPA (75W)	10.5	100 a
Dacthal (75W)	10.5 + 7.5 ¹	100 a
Dacthal (6F)	10.5 + 7.5 ¹	97 ab
Dacthal (6F)	10.5	93 abc
UC77892 (4FL)	6	93 abc
UC77892 (80W)	6 + 3 ²	90 abcd
UC77892 (4FL)	6 + 3 ²	90 abcd
Betasan + Devrinol	5 + 1/treatment	87 abcde
Betasan + Devrinol	5 + 1.5/treatment	87 abcde
Betasan + Devrinol	5 + 2/treatment	87 abcde
UC77892 (80W)	5 + 5	87 abcde
Devrinol (50WP)	2	87 abcde
Devrinol (50WP)	1.5 + 1.5	83 abcdef
Ando-A	3	83 abcdef
UC77892 (4FL)	4	83 abcdef
UC77892 (4FL)	7	83 abcdef
UC77892 (80WP)	5	80 abcdefg
Devrinol (50WP)	2 + 2 ¹	80 abcdefg
UC77892 (80WP)	6	80 abcdefg
Bensulide	7.5	80 abcdefg
Benefin	2.0	80 abcdefg
UC77892 (4FL)	4 + 2 ²	80 abcdefg
DCPA (5G)	10.5	77 abcdefgh
UC77892 (80W)	5 + 2.5 ²	77 abcdefgh
UC77892 (4FL)	5	77 abcdefgh
Devrinol (50WP)	1.5	77 abcdefgh
UC77892 (80W)	4	77 abcdefgh
UC77892 (80W)	4 + 2	73 bcdefghi
UC77892 (80W)	4.5	73 bcdefghi
Bensulide	10.0	73 bcdefghi
Devrinol (50DF)	2	73 bcdefghi
Devrinol (50DF)	1.5	73 bcdefghi
Devrinol (5G)	1.5	70 cdefghi
Devrinol (50DF)	1	70 cdefghi
Devrinol (5G)	2	67 defghij
Devrinol (50DF)	1 + 1 ¹	67 defghij
Bensulide	10.0	63 efghijk
Devrinol (50WP)	1	63 efghijk
Ronstar (2G)		57 ghijkl
Devrinol (5G)	1	47 jklmno
Control		10 q
Grand mean	6.7	
C.V.	18.9%	

Averages spanned by the same letter are not significantly different using Duncan's "new" multiple range test (5%).

Standard error of the mean = .726558
Error mean square = 1.58366
Degrees of freedom = 142

Soil persistence of Tupersan is about 60 days. As with other preemergent herbicides, this will vary depending on rainfall, soil type and soil temperatures. Principal decomposition in soils is by microbial activity. Volatility and chemical decomposition contribute little to the loss. Photodecomposition may occur when the herbicide is exposed to sunlight for several days or weeks under hot, dry conditions. There are other preemergent herbicides currently on the market. They are somewhat restricted in their area of use, principally on the warm season grasses such as Bermuda, Zoysia, Saint Augustinegrass, centipede grass or Bahaiagrass. These include products such as atrazine or Aatrex, metribuzin or Sencor, pronamide or Kerb, simazine or Princep, and oxidiazon or Ronstar.

If we look to the future for additional preemergent herbicides, we find it quite interesting. There are several products already near or approaching the market that have promise. These include such products as pendimethalin (Prowl), napropamide (Devrinol) and an experimental preemergent herbicide from Union Carbide identified as UC77892 available either in a flowable or wettable powder formulation. These preemergent annual grass control herbicides have been or are under evaluation for their potential use in controlling annual grasses in turf and hold some promise for the future.

Evaluation of preemergent herbicide efficacy has been conducted yearly since the program started at Purdue University in 1950. There has been a great amount of product performance data collected. Only data from 1982 in Table 1 and from 1983 in Table 2 are included. Preemergent crabgrass control plots are maintained on a thin, mature stand of common Kentucky bluegrass, *Poa pratensis* L. Prior to herbicide application the grass on the site is scalped and vertically cut to thin the turf and develop conditions conducive to crabgrass growth. In addition, the site is irrigated excessively. Thus potential for crabgrass is very good and performance of preemergent herbicides given a good test. Control is measured as percent control observed in mid-summer.

Preemergent Weed Control

Interpretation of data should include evaluation of the letters following each number. If a number is followed by the same letter, there is no significant difference in the amount of crabgrass control. For example, all numbers with an "A" following are not significantly different.

In the Midwest, Dacthal, either as 75 WP or the 6F (flowable formulation) continues to give the best control. Other products, such as benefin (Balan), bensulide (Presan, Betasan, Lescosan) and oxidiazon (Ronstar) give acceptable control where population stress is not severe and perennial turf density is good. It is interesting to note that in the East, the opposite results are observed where the bensulide and benefin give better control than Dacthal. The newer herbicides, napropamide (Devrinol) and pendimethalin (Prowl) continue to look promising.

There is also a new experimental formulation with potential from Union Carbide, UC77892, available either as a wettable powder or flowable. In addition to its potential as a good pre-emergent, it has good early post-emergent control. In 1983, early post-emergent treatments were made at Purdue University when crabgrass was in the two to three leaf stage on 23 June, 1983 (Figure 3). Measurements were made on 12 July, 19 days after treatment. The UC77892 at 5 and 6 lbs. ai/A, controlled the young crabgrass. When applied to mature crabgrass later on 29 July 1983, it was not effective. When available, the UC77892 will be another good preemergent herbicide available to the lawn care industry. Its use will expand the time period available within which to make applications into the early postgermination period. Thus, when new customers contract for service late in spring or early summer, it can serve as an alternative to the old standards. It has the potential to control emerged crabgrass in the early stages of growth while offering the prolonged residual control desired to maintain crabgrass-free turf for the remainder of the growing season.

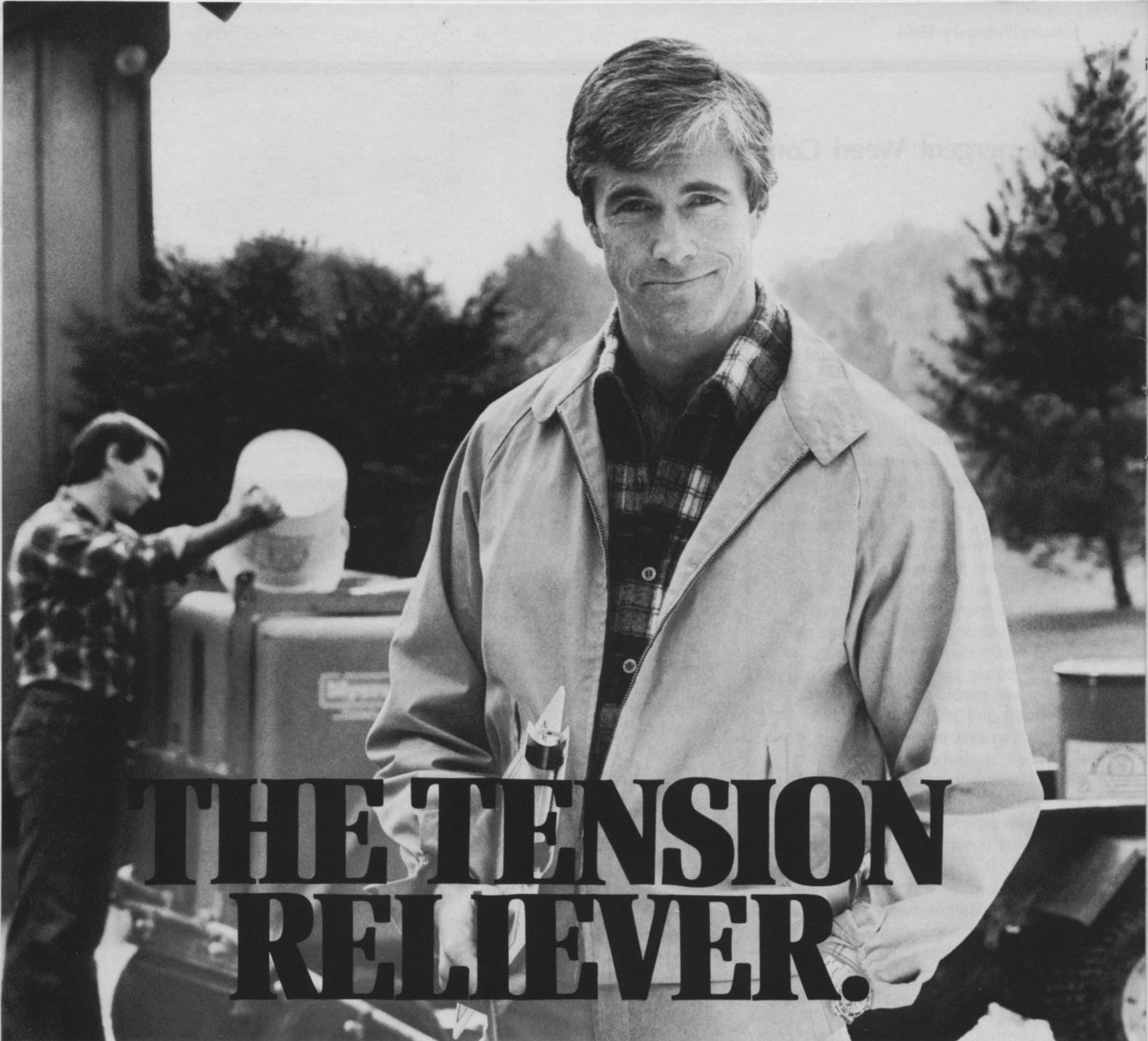


Figure 3: Young crabgrass plants that were controlled with postemergence.

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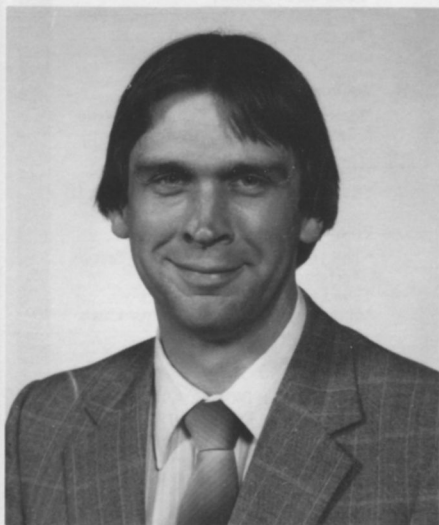
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2,4-D— Where Are We Headed ?

by Bruce E. Branham, Michigan State University



Bruce E. Branham is an assistant professor of Turfgrass Science in the Department of Crop and Soil Science at Michigan State University. He received his B.S. degree in chemistry from the University of Illinois and his M.S. and Ph.D. degrees from the University of Illinois in horticulture. Dr. Branham's research interests are in herbicides and plant growth regulators.

The last few years have seen an increased public concern and mobilization over the issue of pesticide use in the urban environment. As an example, a lawsuit was recently filed in mid-September against Michigan State University in an attempt to bar the spraying of 2,4-D for turfgrass weed control on the campus. Although the suit was eventually overturned, the University was restrained from spraying 2,4-D until the suit was settled in mid-October.

The main points in the suit of the plaintiffs against MSU were that weeds

can be controlled by proper management without the need for herbicides and an analysis of a worst case scenario of 2,4-D exposure.

The first point, as all of us in the lawn care industry know, is just not true. Proper management will reduce weed populations and perhaps prevent the invasion of a particular species, but a chemical weed control program is still required to maintain an acceptable quality turf.

The second point involved a worst case scenario for 2,4-D application. This testimony was also fraught with errors since the worst case scenario presumed an aerial application of 2,4-D with a spray height of 50 feet. It was stated that as much as 50% of the 2,4-D would drift up to 1 mile before settling onto the ground. The scenario then tried to approximate the respiratory dose received by a person walking through the spray drift. Obviously,

A law suit against MSU attempting to bar the spraying of 2,4-D on campus was eventually overturned

2,4-D is rarely applied in an urban environment with an aerial spray. The Grounds Maintenance Department of MSU applies 2,4-D with a tractor powered sprayer with a boom height of 20". The drift potential from a 20" boom sprayer is negligible. Furthermore, the calculated dose received by a 132 pound male was less than the tolerance level permitted for workers in an industrial area as determined by the EPA.

A third subject broached in the

hearing was the problem of dioxins in 2,4-D. The term dioxin has been used in many popular magazines and newspapers to describe one particular isomer of the dioxin family, 2,3,7,8-TCDD or 2,3,7,8-tetrachlorodibenzo-p-dioxin. This compound is only one member of a family of 75 possible chlorinated isomers of dibenzo-p-dioxin. 2,3,7,8-TCDD is the most toxic of all the chlorodibenzo-p dioxins tested (2) and may be the most potent toxin of low molecular weight known (3). The production of 2,3,7,8-TCDD occurs primarily in the manufacture of trichlorophenol where 2,3,7,8-TCDD occurs as a trace contaminant. Because 2,4-D is manufactured from 2,4-dichlorophenol it was reasoned that 2,4-D would also contain some types of chlorodibenzo-p-dioxins. A recent study by a group of Canadian scientists (4) using a very sophisticated analytical method identified 2,7-dichlorodibenzo-p-dioxin, 1,3,7-trichlorodibenzo-p-dioxin, and 1,3,6,8-tetrachlorodibenzo-p-dioxin in commercial samples of 2,4-D at levels from 0.08-8 PPM. They did not find 2,3,7,8-TCDD present in any commercial sample of 2,4-D and they stated that their technique was sensitive to 1 ppb (part per billion). The toxicity and persistence of the isomers of chlorodibenzo-p-dioxin found in samples of 2,4-D is much less than that of 2,3,7,8-TCDD. The di, tri, and tetra isomers found in 2,4-D are one million, fifteen thousand, and fifty thousand times less acutely toxic than 2,3,7,8-TCDD. It is also known that most dioxins including 2,3,7,8-TCDD, photodegrade on the leaf surface when formulated as a herbicide (5), and that the soil persistence of the three isomers found in 2,4-D is much less than 2,3,7,8-TCDD should go a long way to ease the fears of "dioxin" in 2,4-D.

Another point of contention con-

cerning 2,4-D that should be addressed is its carcinogenic activity. A large number of scientific experiments have concluded that 2,4-D is not a carcinogen. A 1971 joint meeting of the Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO) expert committee on pesticide residues concluded that 2,4-D was not a carcinogen (6). However, a small number of studies have shown that 2,4-D may indeed be a weak carcinogen. The United States EPA has initiated a data call-in for new data on the carcinogenicity of 2,4-D. This occurred during the reregistration process that each pesticide must undergo every five years. Therefore, the possibility exists that 2,4-D is a weak carcinogen; however, the bulk of the existing scientific evidence shows that 2,4-D is not carcinogenic.

These are some of the points on which future attacks against 2,4-D and other phenoxy herbicides will be based. The key to keeping 2,4-D on the market is education. Both proponents and opponents of 2,4-D need to be able to speak authoritatively about 2,4-D. The evaluation of toxicological data is a very difficult task and should be left to individuals trained in that area. Citing one or two toxicological studies as if their results are the last word on the toxicology of a particular compound is nonsense. The entire body of scientific literature on the toxicology of a particular compound must be evaluated by a trained toxicologist in order to determine the potential environmental hazards of a compound.

The suit against MSU received considerable media attention and some, primarily the campus newspaper, seemed to favor the plaintiffs. This kind of local action to stop pesticide usage is becoming more common throughout the nation. The anti-herbicide movement can be traced to small groups of rural citizens who became concerned about the health effects of the phenoxy

herbicide 2,4,5-T (1). One of the first groups to ban together against pesticide use is Oregon's Citizens Against Toxic Sprays (CATS).

It seems clear that these people will continue to press for the removal of many of the commonly used pesticides from the marketplace. Most of these people are well intentioned and concerned about our environment. We must attempt to show these people that every effort is made to 1) protect the environment from chemical degradation; 2) insure the largest margin of safety to the general public when using pesticides, and 3) insure the adequate protection of spray applicators. Methods of accomplishing the above points are more difficult to define but would include a broadbased attempt to educate the general public, perhaps through newspaper and popular magazine articles, on the toxicology of the pesticides presently in use. For example, it should be common knowledge among people in our industry that 2,4-D taken into the body in small doses, is fully excreted in the urine in about 96 hours. A study done with human volunteers (7) who were administered a single oral dose of 5 mg 2,4-D per kg of body weight found that 95.1% of the 2,4-D was excreted in the urine with a half-life of 11.6 hours. Of the 95.1% 2,4-D recovered, 82.3% was the free 2,4-D acid and 12.8% consisted of 2,4-D conjugated with an organic compound. It was concluded that 2,4-D does not accumulate in the body and that there is no metabolism of 2,4-D in humans.

Environmentalists often use one or two scientific articles as the basis for their arguments. They then supplement their lists of references with newspaper or magazine articles that are not scientific in nature. An example is a book entitled, "The Other Face of 2,4-D", (8) published by the South Okanagan Environmental Coalition. This supposedly unbiased review of 2,4-D contains several factual errors while referencing

about 25 newspaper and magazine articles and over 20 unpublished papers (9). Clearly these types of publications must be refuted in an unemotional, scientific manner.

2,4-D is a herbicide that has been widely used since the early 1950's. Its safety record is exemplary. 2,4-D does not represent a health hazard to the general public as it is presently used. We have at our disposal a very safe, effective, and economical herbicide which will remain a useful tool in turfgrass management.

Much of the information used in this article was obtained from a review of the subject presented by Dr. Wendell R. Mullison at the 1981 Weed Science Society of America meetings. A copy of the review, entitled "Public Concerns About the Herbicide 2,4-D", is available from Dow Chemical USA, Agricultural Products Department, Public Affairs, Midland, MI 48640.

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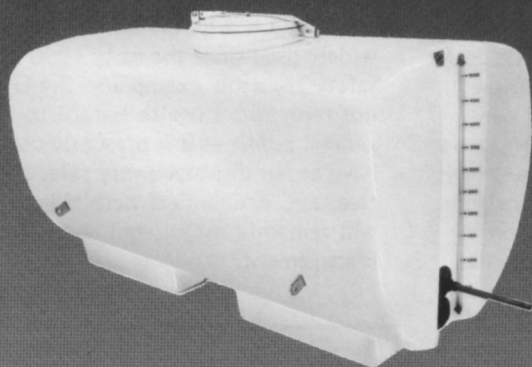
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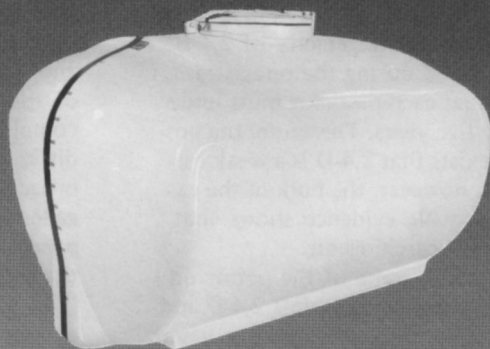
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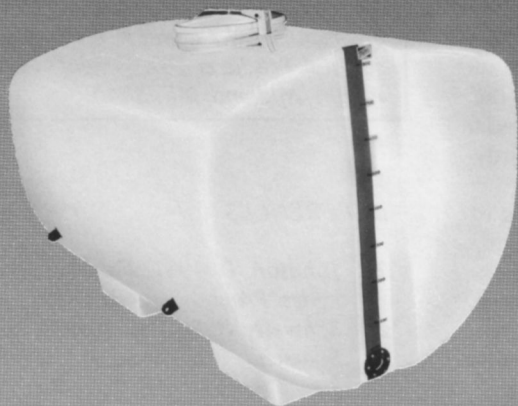
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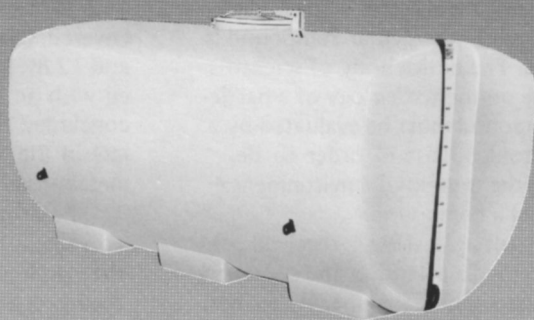
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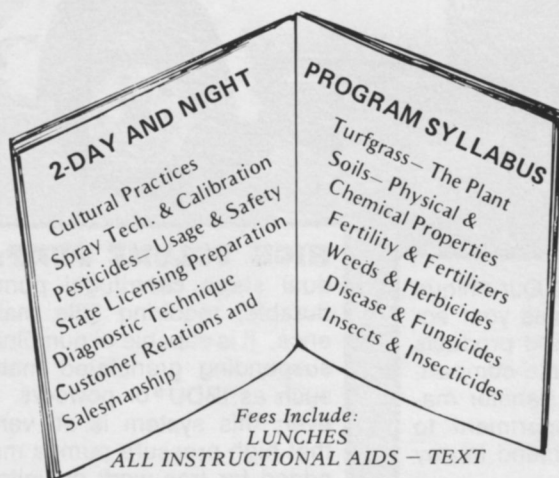
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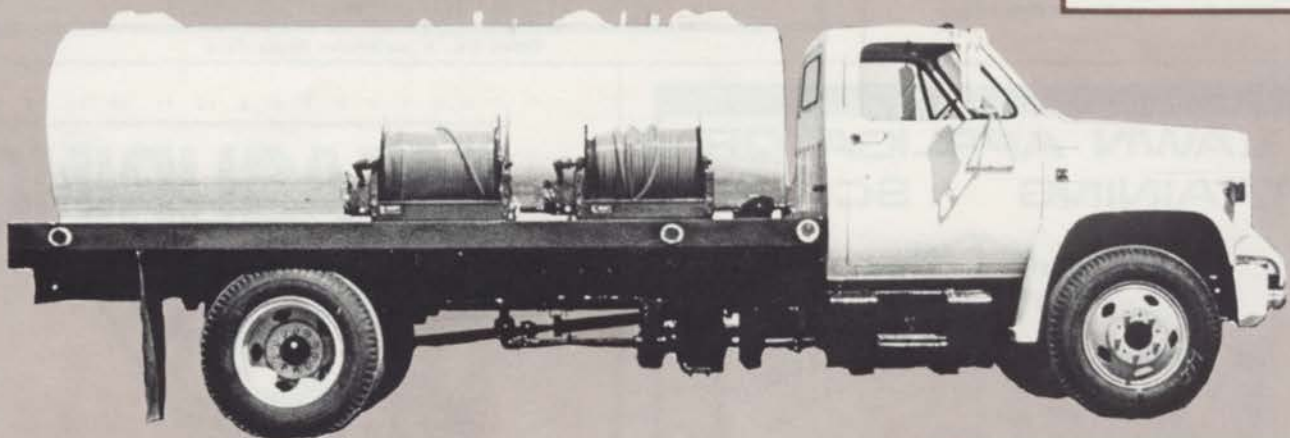
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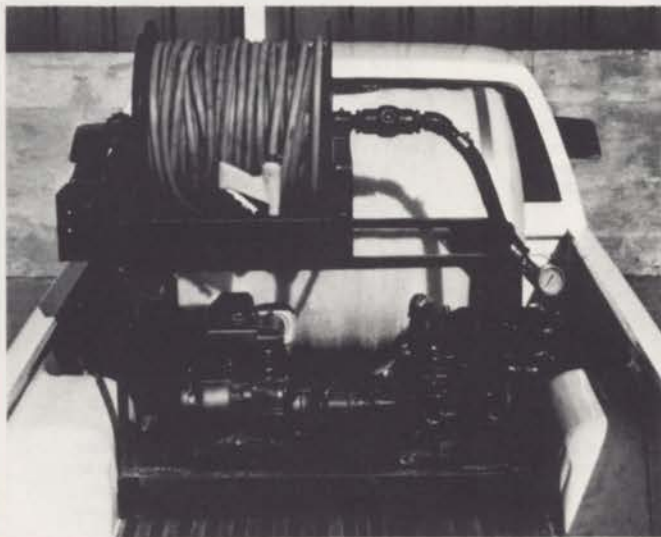
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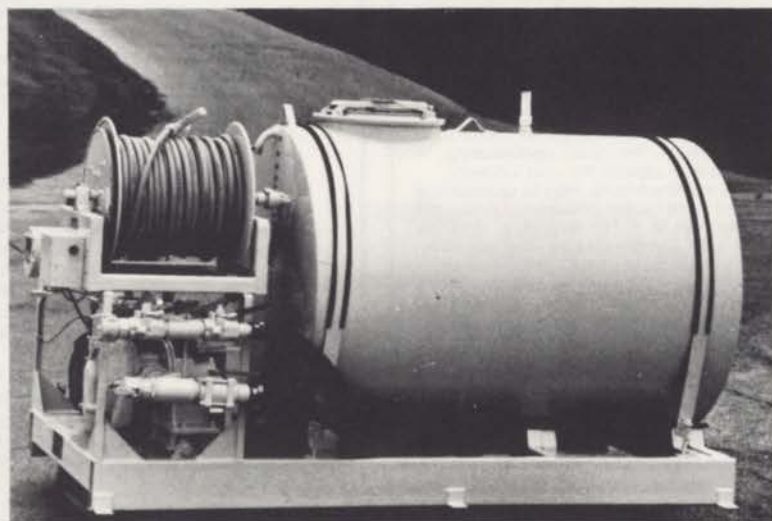


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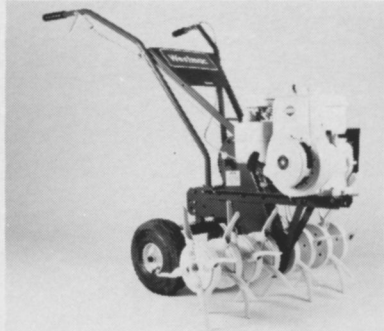
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WANTED TO BUY— Lawn spray/tree spray company or accounts. S.E. Penn., central and southern NJ. Residential, commercial and industrial accounts any size including sterilization. Contact Steve after 6 p.m. (215)357-8875, or write to Spray Associates, Box 445, Warrington, PA 18976.

TRACTOR/LAWN COMBINE UNITS (2) No. 179 IH Hydrostatic tractors w/10 gal. tank on tractor. Combines are stainless steel with aerators, 4 granular bins and 20 gal. spray tank. \$3,500 per unit. Call (315)637-6001 or (315)492-3217.

ACCOUNTS WANTED— national chemical lawn care company seeks accounts to acquire. Selling price open for negotiation. If interested, send name, address, phone number and number of accounts available to Dept. B, American Lawn Applicator, 31505 Grand River Ave., Suite One, Farmington, MI 48024.

WANTED TO BUY— Lawn care company in Midwest (Mich., Ill., Ind., Wisc.) area. Small to med. size. Chemical turf applications only—no mowing or tree care. Send information to Lawn Care, P.O. Box 361, Grosse Isle, Mich. 48138.

WANTED— Used four wheel self-propelled Hahn or Cushman 120-175 gallon sprayer for greens. P.O. Box 191, Brentwood, TN 37027. (615)794-6646.

WANTED— Dealers/Distributors for Ag Spray Hose. Hose is of finest quality and fully guaranteed. Receive distributor discounts and supplement your winter income. Call Dick Charles, Green Thumb Spray. (516) 485-1919.

FOR SALE— 1979 Ford tractor/loader, 545 tractor, rops, cab and box scraper. A-1, 800 hrs. (414) 387-4542 ask for Dick.

Proper Handling of Environmental Chemicals (Or How To Live a Less Stressful Life)

by Ian S. Oppenheim, Esq.

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Ian S. Oppenheim, an attorney with offices in Boston and Halifax, specializes in pesticide law. He is also a registered lobbyist who represents his clients nationally at both the legislative and regulatory levels. Mr. Oppenheim has been active in both the public relations and legal battleground of pesticide related issues. He is the executive director of Rational Approach to Pesticides, Inc. (RAP) which is the Massachusetts alliance of all pesticide users. Ian is also the executive director of the New England Pest Control Association (NEPCA) which represent most structural pest control operators in the states of Massachusetts, Rhode Island, New Hampshire, Maine and Vermont. Ian has been the featured speaker at many local, state and national user group gatherings, including PLCAA's national and regional conventions and has developed hundreds of contacts on both sides of the pesticide issue.

It is one of those days! As you walked through the door this morning, you were met by your service manager who informed you, that a new customer, who hired the company to treat his lawn, just happens to live next door to a rabid organic gardener who made the local environmentalists sound like pesticide salespeople.

3:30 p.m., a state pesticide inspector is at the door asking to examine your pesticide application records (you mean to tell me that I need to keep records in this state?). It appears that a complaint has been filed against your company alleging a pesticide misapplication and he has been assigned to the case. You try to concentrate, to think of a reply to give to the inspector, you feel trapped. What should you do? More important, how could you have prevented this? The time to plan for a visit from any kind of inspector is now—before you find yourself in an uncomfortable situation.

FIRST THINGS FIRST

One task which must be completed before you begin your first application,

is to research the laws and regulations of the state and municipalities in which you intend to do business. Most states have their own pesticide laws and regulations under which you and your business are governed. The fines and penalties for violating these laws can be very stiff. Sometimes, criminal penalties such as jail terms are allowed by statute.

Questions which you MUST ask are; whether the state has licensing requirements; what type of record keeping, if any, is required; and what type of chemicals can be used. If your company does business in more than one state, each state's laws and regulations must be reviewed and followed. While there are many similarities between states, there are also many differences which mean that doing a thing legally in one state may be illegal just across the border. Generally speaking, the state agencies which have been given the job of overseeing a state's pesticide laws are quite willing to assist anyone interested in compliance.

The job of using environmental chemicals is getting more complex and legalistic every day. Today, technical expertise is only one half of the solution to carrying on a profitable firm. The other half is knowing and following all of the legal requirements to the letter.

DO THE INVESTIGATING YOURSELF

The natural inclination is to avoid confrontations and procrastinate investigating complaints. Not only is this an unwise policy but it could put you out of business. Some state laws require a written record be made of EVERY complaint received by the pesticide user. Even if this is not the law in your state, it is recommended that you adopt this practice for your company.

Further, someone from your company should immediately contact the complainant and determine if a field inspection is necessary. If a determination is made that a visit would be even remotely helpful, take the time to conduct it. The key at this stage is to be friendly to the complainant and avoid arguments as much as possible, being

careful to neither admit nor deny error. The purpose of your field investigation is for you to be able to make a careful study of the situation, not make a positive determination of guilt.

A properly conducted investigation, can also be invaluable in cases where a dispute is unable to be resolved satisfactorily and litigation or government action follows. Be sure to make careful observation, taking samples and pictures where needed. Send an individual who has sufficient expertise to conduct the study in a fair minded and impartial manner. It will do you no good to receive a report which has been written with a bias towards you. You want to know exactly what has occurred, and the best way to learn that information is from an impartial fact gatherer.

Once back at the office, talk to the people involved in the pesticide application, and see to it that all your records accurately reflect the conditions and other factors which affected the application. Further, it is sometimes helpful to write down the comments of the complainant, neighbors, technicians and others involved in the incident.

The point is this: when notified of a complaint, don't freeze and hope it will go away. Most likely, it will remain and grow until it cannot be ignored. Better you make an attempt to resolve it quickly, than to let it develop into a matter which you may be unable to control. If after trying in good faith to resolve the issue, you are thrust into litigation or governmental inquiry, you will already have a complete file to utilize in proving your innocence to a judge or administrative officer. As for the inspector, he or she will probably be impressed with your professionalism and appreciate the fact that you have made his investigation go more quickly and easier.

There are many other tips you can use which will make your use of environmental chemicals safer, and at the same time, insure that the company will be able to make a proper response in answer to governmental inquiries or complaints. But they all center around the same points.

Never forget that you and your em-

Con't on page 24

Custom Blend Fertilizers

Spring Valley Turf Care Products, a division of Vogel Seed & Fertilizer, Inc., has been serving the plant food business for over 30 years in Jackson, Wisconsin. Bill Vogel, Vice President of Vogel Seed & Fertilizer, Inc., is an agronomist and has been in charge of the Spring Valley Turf Care Division for the past 6 years. One of the services Bill offers his customers is custom blending of dry or liquid fertilizers made to the customer's specifications. They sell their products direct to the lawn care companies, which keeps Vogel in close contact with his customers and their needs, as well as saving them money.

Besides the custom blends, Spring Valley also makes many different types of fertilizer with crabgrass preventers, such as a 34-0-10 + benefin, 19-6-8 + benefin, a 10% sprayable benefin and

a 20-5-5 + Dacthal. These fertilizers are made with different amounts of slow release nitrogen to fit different programs and budgets. They also have dry fertilizers with Dursban or Oftanol.

One of the new products Spring Valley is making is called Milorganite Extra Professional. This is a high analysis organic fertilizer with added essential nutrients. Milorganite Extra Professional has an analysis of 20-4-8 + 1% iron and is safe and non-burning.

Spring Valley also has an equipment division that supplies customized spraying equipment. For more information, contact Bill Vogel, Spring Valley Turf Care Products, 1891 Spring Valley Road, Jackson, WI 53037, or use the reply card.

Circle No. 13 on Reader Reply Card

New Spray Unit




Professional Turf Equipment has recently released a new self-contained spray unit for intermediate range pickup trucks. The spray unit comes complete with electric hose reel, electric start engine, and 100 gallon capacity. This unit can be used for tree, shrub, or lawn applications. One model is also available with split tanks. For more information, contact Professional Turf Equipment, 400 Northtown Road, Normal, IL 61761, or use reply card.

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Circle No. 16 on Reader Reply Card

Hahn Introduces the JR-4



New from Hahn, Inc. is the JR-4 walk-behind Aerifier, designed especially for the professional lawn care industry. Just 34 inches wide— to go through the typical 36 inch gate. With the self-propelled JR-4, the average operator can aerify 26,000 sq. ft. per hour, at an easy 3 mph.

This new Aerifier features a trouble free clutching system for separate reel

and wheel drives, with all controls located for the operator's convenience. The reel drive control allows the operator to aerify as fast as he cares to walk, cultivating a 20 inch swath at 56 holes per sq. yd. The wheel drive insures ease of transport and loading.

Patented Aerifier Spoons loosen the soil beneath the turf while removing cores of soil, penetrating to 3-1/2 in. Optional "open" or "closed" spoons

are available in 1/4 to 3/4 inch sizes. Up to 52 lbs. in weight bars can be added to this rugged machine when soil conditions dictate.

For more information, contact Hahn, Inc., 1625 N. Garvin St., Evansville, IN 47711, or use the reply card.

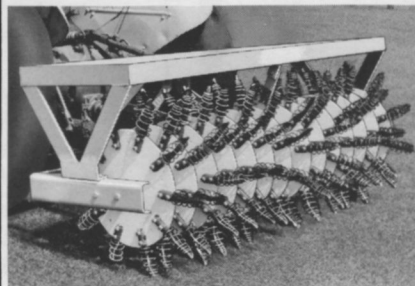
Circle No. 17 on Reader Reply Card

Hahn

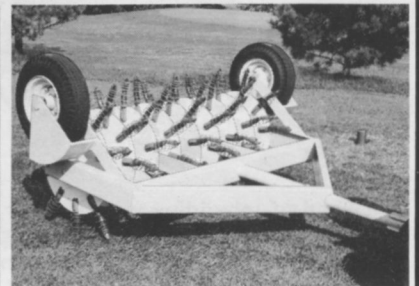
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Circle No. 13 on Reader Reply Card

How Do Customers Perceive Their Lawn Care Service ?

A research study, sponsored by Mobay Chemical Corporation, indicated that the majority of those who use a professional lawn care company are satisfied with the service.

The research, designed to obtain information about lawn insects and products, consisted of 505 telephone surveys completed by homeowners who lived in suburban areas and had lawns ranging from 5,000 to 15,000 square feet. Almost half of those respondents, 222, reported they either rely only on a lawn service or they use a service and do some of the maintenance themselves.

When asked if they were satisfied with their service, 82 percent responded positively. Their comments imply that prompt service and reliability are all-important attributes of a lawn care company. It is significant to them that the lawn care professional be courteous and show concern for the health of their

lawn. In addition, they want to feel like their business is appreciated.

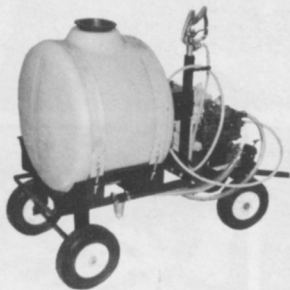
Only ten percent indicated dissatisfaction. Comments made by this group suggest that careful scheduling would reduce the number of cancellations and minimize customer complaints. Seven percent responded that they didn't know because it was too early to judge the results.

The research also included in-depth group interviews with consumers and lawn care representatives. According to this study, convenience is the most important reason why a homeowner uses a professional lawn service. Neighbor peer pressure also affects their decision. The findings revealed that although customers prefer to spend their leisure time doing other activities, they are proud of their lawn, they want their lawn to enhance their image and the image of the community.

A second consideration in the decision to use a lawn service is safety. Responses which indicated concern about possible harmful side effects suggest that some customers would like educational information and relevant instructions about the products used on their lawn.

By design, Mobay directed that the interviews and surveys be conducted the person who is actually responsible for making decisions regarding lawn care. This provided a demographic profile of lawn care customers as affluent, having an annual household income of \$25,000 plus, and typically aged 35 or older. Of those surveyed, 52 percent were female and 48 percent were male.

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Circle No. 35 on Reader Reply Card

Con't from page 21

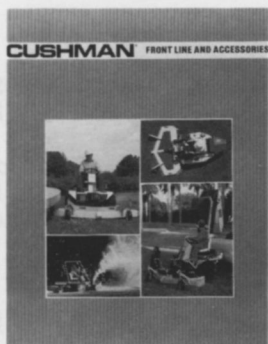
Proper Handling...

Employees are constantly using potentially dangerous chemicals. The public at large, and your customers specifically, are greatly aware of their potential effects. This concern has been heightened by numerous scare stories and other tactics of those who oppose all use of environmental chemicals. You should be well aware of this atmosphere of fear. The plain and simple truth is, that when your company uses environmental chemicals in accordance with label instructions, and your employees treat them with the respect they deserve, their use is completely safe. Your task is never to lose sight of this fact. Rather, make these realizations a constant part of your job and act professionally at all times.

The industry is far past the stage of lobbying against all state laws which control the use of environmental chemicals. Now, your task, is to know and obey the laws that are already in force and take an active role in adopting or modifying laws which will help you do your job better and more professionally.

+++

New Cushman Catalog Available



OMC Lincoln has announced the availability of a completely new catalog covering the Cushman, Front Line mower.

The new catalog, in full color, details the features and benefits of the 3-wheel Front Line mower and its Grass Caddy system. The catalog also shows a wide range of options and gives specifications on the units. For a copy, write Cushman Front Line, OMC Lincoln, P.O. Box 82409, Lincoln, NE 68501, or use the reply card.

Circle No. 18 on Reader Reply Card

Olathe Athletic Field Machine



Olathe has combined 3 of its popular models into one compact unit with the idea in mind to provide total professional conditioning to ball parks and playing fields. This "Package Deal" scarifies and drags infields, sprays fields, and transports people, satisfying several

maintenance needs with one economically priced "Machine". For more information, contact Olathe Manufacturing, Inc., 100 Industrial Parkway, Industrial Airport, KS 66031, or use the reply card.

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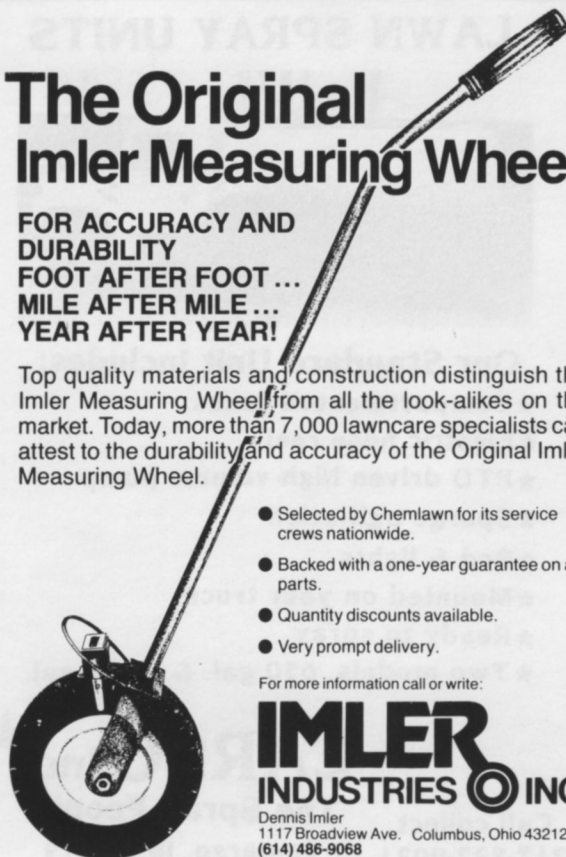
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Top quality materials and construction distinguish the Imler Measuring Wheel from all the look-alikes on the market. Today, more than 7,000 lawncare specialists can attest to the durability and accuracy of the Original Imler Measuring Wheel.

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Dennis Imler
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Circle No. 20 on Reader Reply Card

Broyhill's New 1984 AG Catalog



A new 68 page color catalog represents the Broyhill line of liquid application equipment. Designed to make it easier to read and order, the 1984 Ag Catalog is broken down into the following standard models: tractor mounted carriers; trailer sprayer models; rope applicators; 3-point models; truck/pickup sprayers; and 60/80 foot boom sprayers. Also represented is their special use application equipment and standard booms, along with tanks and specifications. For more information, contact The Broyhill Company, North Market Square, Dakota City, Nebraska 68731, or use the reply card.

Circle No. 21 on Reader Reply Card

Bajaj Tractor Trailer



Bajaj America presents a 5 wheel mini-tractor trailer. The Bajaj tractor trailer has proven ideal for nursery and landscaping applications. It features a narrow 48" wide, highly maneuverable vehicle with a 1600 lb. payload. For more information, contact Bajaj America, Inc., 1237 Gadsden St., Columbia, SC 29201, or use the reply card.

Circle No. 22 on Reader Reply Card

Calendar of Events

MAY

1984 ARIZONA TURF, LANDSCAPE AND IRRIGATION CONFERENCE & SHOW—

May 3-5. Phoenix, AZ. Contact William R. Kneebone, Dept. of Plant Sciences, Univ. of Arizona, Tucson, AZ 85721 (602) 621-5323.

NORTH CAROLINA TURFGRASS AND LANDSCAPE FIELD DAY—

May 23, NCSU Turf Field Plots, Raleigh, NC. Contact J.M. DiPaola, 1126 Willimas Hall, NC State University, Raleigh, NC 27650. (919) 737-2657.

TENNESSEE TURFGRASS MANAGEMENT RESEARCH FIELD DAY & EQUIPMENT SHOW—

May 29. University of TN Turfgrass Management Research Field Plots on the Agricultural Campus at U.T. Knoxville. Contact Dr. L.M. Callahan, Ornamental Horticulture and Landscape Design. (615) 974-7324.

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2232 Attend Ohio Show

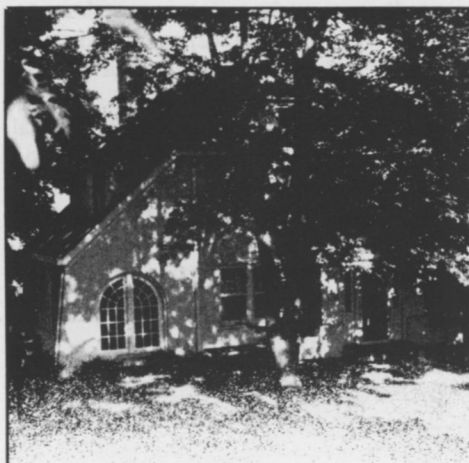
The Ohio Turfgrass Conference and Show, held recently in Cincinnati, once again broke attendance records as over 2000 gathered for the four day show. Sponsored by The Ohio Turfgrass Foundation, The Ohio Cooperative Extension Service, Ohio State University and The Ohio Agricultural Research and Development Center, the show is the largest regional in the country and draws people from all facets of the industry.

The show encompassed golf course, lawn care and grounds maintenance sessions, as well as ornamental, turfgrass and mechanic (small engine repair) workshops. Exhibit space on the convention floor was a sell out. One hundred and sixty exhibitors filled the 257 booth spaces, which was an increase over last year of 57 booths.



Next year (1984) the show moves back to Columbus and will be held December 3rd through 6th. If you would like information about attending the show or joining the Ohio Turfgrass

Foundation, contact Dr. John Street, Ohio State University, The Agronomy Dept., 2120 Coffey Road, Columbus, OH 43210.



Thanks to trees, we can cool the rays of the sun. When trees shade our homes, the temperature drops substantially. That means our air conditioners won't have to work so hard in the summer. We save energy, and money as well.

Conservation Trees do a whole lot more. Planted on steep hills, the trees' roots keep the land from

washing away when it rains. And in the country, trees can be planted as shelterbelts keeping the soil from blowing away.

Find out how Conservation Trees can help you. For your free brochure, write: Conservation Trees, The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.

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A cool shaded home and a searing landscape may seem worlds apart, but the only difference between the two are trees...

Conservation Trees that can turn a desert into a cooling oasis.



The Bulk Pesticide Concept

by Gary M. Clayton, Bulkkem Corp.



Gary M. Clayton received his Masters Degree in Turfgrass Science from the University of Illinois where he was a Research & Teaching Assistant. He received his Bachelor of Science Degree from Illinois State University. Gary is the Operations Manager for the Bulkkem Corporation. He also serves as the Director of Professional Turf Equipment's Lawn Applicator Training Seminar.

Lawn care has inherently grown to be a highly visible industry. It has manifested this image through intense marketing, which includes equipment passing through residential areas, constantly in the public eye. Even though the portion of pesticides applied by lawn care companies is a small fraction of the sum total of all pesticides used, the lawn care industry remains the most apparent and has the greatest impact on public opinion. The lawn care industry has an obligation to educate itself to the specific pesticides applied on turf so that any potential negative attitudes may be answered. In the same respect, there becomes a second obligation to develop innovative means to operate within the safety parameters of handling, storing, and disposing of pesticides and its by-products. With the tremendous growth lawn care companies have enjoyed during the past several years, these parameters have become a great concern to the industry at large.

One method that has been employed to satisfy these operational concerns is the bulk system. The scope

of this article is to introduce and present information relative to the current trend for bulk handling of pesticides in the lawn care industry.

A bulk system consists of a pesticide station comprised of one storage unit per product and a dispensing method. The system is economical, eases daily operation, and offers many other benefits. When compared to smaller containers, the greatest benefits derived from the bulk system are cost, time, and safety. The highlighted cost and time savings includes the elimination of triple rinsing, the expense of properly disposing of drums, the facilitation of inventory control, and the reduction of warehouse space. The safety factor is of direct concern. With the bulk system, there are no containers to (1) lift and handle, (2) upset and spill, and (3) pour from, thus reducing exposure.

The United States Environmental Protection Agency issued a policy applicable to the Bulk Concept since, "It has come to our (EPA) attention that an increasing practice among manufacturers and distributors of pesticides in-



The Bulk transporter has been redesigned to assure safety of pesticide delivery.



Bulk storage tank within a diking system.



An assortment of tank sizes available for bulk storage.



Bulk storage eliminates the requirement of triple rinsing and proper disposal of drums.



Meters with totalizers allow for accurate measurements and inventory control.

volve the transport and transfer of pesticides in large quantities, i.e. 'bulk' for the purpose of the policy the EPA has termed 'bulk' as any volume of pesticide greater than 55 gallons liquid or 100 pounds dry material held in an individual container."

This policy, issued in 1977, cites the EPA reasons for preference to handle pesticides in bulk rather than in small individual containers. The reasons are basically the same as the aforementioned reasons, but the policy goes on to state, "In the interest of energy and resource conservation, and of improved safety measures in pesticide handling, it is incumbent upon the agency to encourage and endorse these purposes insofar as they are consistent with the broad purposes of FIFRA (The Federal Insecticide, Fungicide and Rodenticides Act.)"

An enforcement policy is defined in regards to bulk shipment and transfer practices. It is the philosophy of Bulk-kem, and should be that of the end user, to institute these practices in accordance with regulations. Among the pertinent is included FIFRA Section 3 (A) [U.S.C. 136A (A)]. It states that no person may distribute, sell, offer for sale, or hold for sale, to any person, any pesticide which is not registered with the Administrator. The purpose of the registration is to provide a vehicle for review, tracing, identifying, and assur-

ing that a labeled product is accountable.

The lawn care company, as an end user, requires no special registration (i.e. establishment of product registration) for the storage and use of bulk pesticides. Yet, regulations that are applicable to the general usage of pesticides should be enacted. If a bulk purchaser, however, transfers the product he purchased in bulk into a smaller container for resale, the registrant could not be held accountable for the product, nor would the transferred product be considered registered. The lawn care company could be subject to enforcement under Sections 12 (A) (1) (A) and 12 (A) (1) (E) for selling and dis-

tributing unregistered and mislabeled pesticides.

A lawn care company should exercise caution if the movement of pesticide is required for either relocation or to supplement the needs of another branch. The Department of Transportation requires placard identification markings depending on the product and quantity which is transported.

PLANNING A PESTICIDE STORAGE AREA

The strategy around planning a pesticide storage area should emphasize both safety and day to day operations. Recommendations and regulations generally focus on the proper storage of pesticides, regardless of whether the pesticide is in a small container or a bulk tank. Whether a single bulk tank or a complex pesticide station is employed, many considerations should enter into the planning of a bulk facility. Some such considerations to take into account are accessibility, growth, proper selection of bulk system materials, and precautions. Bulk tank placement and set-up require a conceived plan since its design is for ease of daily operations. Plumbing should be selected to serve the particular need required. A metering system



Material being dispensed at bulk tank is being metered at transporter with printed ticket for accurate measurement of delivered amount.



Seals and bands assure product integrity.

Bulk Pesticide Concept

should match the quality of work it will have to perform. Many lawn care companies utilize a meter system with a totalizer to allow a quick reading of material used.

The storage area should have the essential equipment that is near any chemical storage. This equipment includes protective handling gear, eye wash, a sink or shower, first aid kit, and assorted material. An emergency procedure with phone numbers should be posted. The National Fire Protection Agency publication 43D publishes a code for storage of pesticides in portable containers which is an excellent reference for guidelines. These guidelines include building location, separation of pesticides, posted signs, storage arrangement, and other storage area requirements.

Spills from leaks are unlikely, yet should a spill occur, dikes prevent a loss and a potential pesticide issue. Walls should be high enough to contain the volume stored in the tanks. Spray tanks from which the material is applied to lawns may also serve as another source of containment if needed. Even though dikes are generally not required by law, a local ordinance could force diking around storage areas whether it is a large liquid fertilizer tank or small containers of pesticides. Pesticides of particular note are Xylene based compounds which are classified as combustible liquids (i.e. Bensulide). The National Fire Protection Agency publication NFPA 30—Flammable and Combustible Liquids Code, provides these as a Class II liquid. This code defines the standards of storing these liquids with, for example, storage arrangement for protected palletized or solid pile storage of liquids in containers and portable tanks, preventative fire requirements and so forth. Lawn care companies storing these liquids should refer to this code. This code does address the control of spillage of Class II liquids on preventing accidental discharge from endanger-

ing important facilities, adjoining property, or reaching waterways by remote impounding or by diking.

Most of the regulations regarding storage of pesticides are well designed and well serve their intended purpose of promoting safety to humans and the environment. The regulations subject to interpretation, or those being generated on a local level will, to a certain degree, reflect the industry's future. The Bulk Concept offers you an alternative to the way you store, handle, and dispose of pesticides and their by-products.

REFERENCES:

1. A.E. Conroy, II, Director Pesticides & Toxic Substances Enforcement Division. 1977. United States Environmental Protection Agency Memorandum Subject Enforcement Policy Applicable to Bulk Shipments of Pesticides. Washington, D.C.
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2,4-D Where Are We Headed ?

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JANUARY/FEBRUARY 1984 ISSUE

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The above numbers correspond to advertisements appearing in this issue. Circle appropriate number and mail card if you wish additional information on any product.

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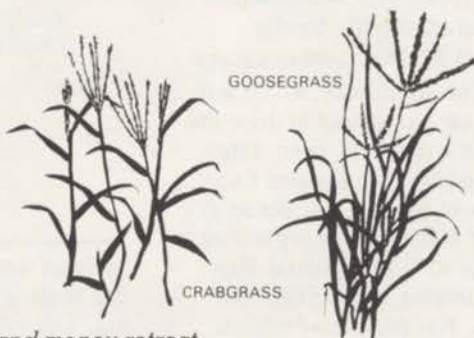
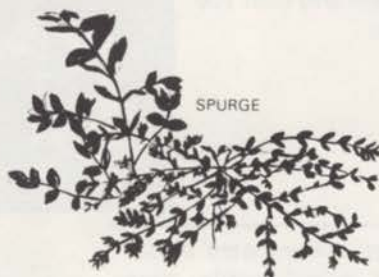
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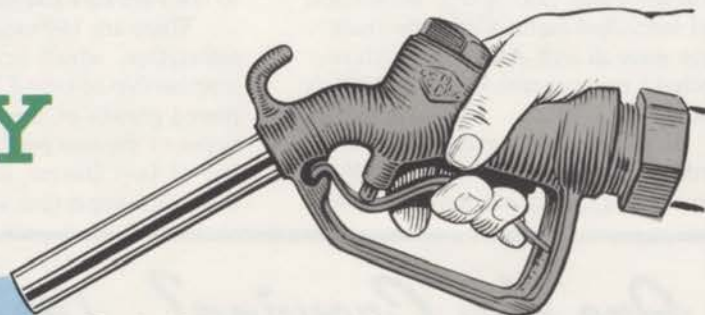
This year don't spend your time and money retreating! You can again receive the reliable control of crabgrass, spurge, foxtail and other weeds with the convenience of pumping a liquid into your tanks.

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DACTHAL[®] FLOWABLE



Dacthal[®] is not only back but it's now available in a flowable form. For years Dacthal[®] has been the standard of the industry when it came to pre-emergence weed control, and now Bulkem offers you Dacthal[®] Flowable.

Save money and contact Bulkem for Flowable Dacthal.[®] Available in bulk quantities of 200 gallons or more.

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BULK SUPPLIERS OF LAWN CHEMICALS

THE BULKEM CORPORATION • 400 NORTHTOWN ROAD • NORMAL, IL. 61761

4th Annual PLCAA Show Indianapolis, November 8-10, 1983

Over 1,000 turf professionals gathered recently for the fourth PLCAA conference and trade show. The attendance, which was up over last year, continued to draw the owners and managers of lawn care companies together. Jim Brooks, Executive Director of the PLCAA, did an excellent job of planning and organizing this year's show. Governmental Regulations, Organizing at the State and Local Levels, National Pro-Pesticide Support, as well as "whats new" in Tall Fescues, Nitrogen Fertilizers, Fungicides and Equipment were some of the topics included in the three-day program. Panel discussions, workshops, and individual lectures and the trade show were all well attended, which reflected a true concern for the industry's future.

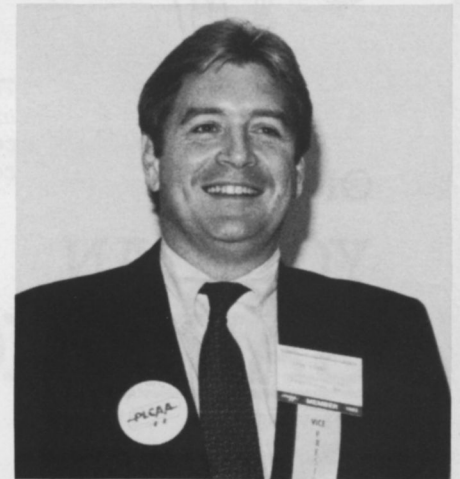
Hundreds turned out for the early bird registration cocktail party on Monday evening, giving everyone a chance

Trade Show area with 106 exhibitors.



to relax and get reacquainted before the trade show opened Tuesday morning. 106 exhibits helped to jam the trade show area. Chemical and equipment companies with "show specials" offered price discounts and gave away everything from coffee mugs and pens to lawn mowers and back pack sprayers.

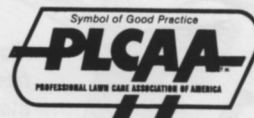
There are 140 new members in the association, which brings the total membership to over 470. With the continued growth of the association, the hopes of the new president, John Kenney of Turf Doctor, are: to continue their very important work on govern-



John Kenney, Turf Doctor, Framingham, Mass., newly elected president of the PLCAA.

Are You Growing?

Are you participating in and using the services of your Association?



- REGIONAL SEMINARS AND CONVENTIONS— Meeting with your peers to exchange ideas and share experiences gives you as a PLCAA member the opportunity to find out "what does and doesn't work."
- TECHNICAL RESOURCE MANUAL— An industry reference source to assist in the day-to-day operation of your business.
- INSURANCE PLANS— Are you taking advantage of the Association's Casualty, Workmen's Compensation; Life and Health programs?
- NEWSLETTER— "Turf Talks," a periodic publication that keeps members up to date on the latest thinking and activities affecting their business and industry.
- INDUSTRY VOICE— Let your voice be part of industry's voice, when we address regulatory groups at federal, state and local level, on behalf of the industry. The more members, the stronger the voice!

Tell me more!

The Professional Lawn Care Association is growing! Together we can make things happen. Grow with us. Complete this application for further information and mail it today.

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

Mail to: PLCAA, 1225 Johnson Ferry Rd., Suite B220, Marietta, GA 30067

Invest in
your
Association
now for
better
management
and
profitability!

mental regulations; increase membership; and continue the work of past presidents in delivering worthwhile services and products to its members. The association is continuing its efforts to have medical coverage available for its members soon, possibly this month.

Once again, we would like to thank Rhone Poulenc for a delightful evening. The Bluegrass Festival was one of the highlights of the convention. Everyone who attended had a great time listening and dancing to the bluegrass music. We truly enjoyed ourselves, as I am sure everyone did.

Next year, the PLCAA Show will be held in Tampa, Florida. If you have never attended one of the shows, then by all means, plan now to attend. The show will open November 12, 1984—mark your calendar! Also, if you are not already a member, use this membership form and join the organization that is doing something to help you and your industry.

+++

HOW TO SELL LAWN DISEASE CONTROL, AND DELIVER IT.



HELMINTHOSPORIUM LEAF SPOT



SCLEROTINIA DOLLAR SPOT



RHIZOCTONIA BROWN PATCH



FUSARIUM PATCH

Turn disease problems into profits with CHIPCO® 26019 fungicide.

Selling disease control is a great way to boost profits and attract new customers.

And CHIPCO® 26019 is the ideal product to help you do both.

The selling proposition: a beautiful, disease-free lawn.

Everything you do for a customer is designed to create a beautiful lawn. Turf diseases look bad...and that can make *you* look bad. A programmed approach includes an effective, long-lasting fungicide like CHIPCO 26019 keeps your customers satisfied.

CHIPCO 26019 is the only fungicide you need.

It can be used safely on all lawn grasses nationwide to control the major turf diseases like leaf spot, dollar spot, fusarium and brown patch. Highly effective and long-lasting, CHIPCO 26019 fungicide fits into your treatment schedule and reduces callbacks.

In short, when you've got CHIPCO 26019 on the shelf, you're ready for *business*.

Send for FREE booklet on how to sell disease control.

We've put together a booklet that details lots of effective techniques and tools for selling disease control to your customers...and delivering it with effective, long-lasting CHIPCO 26019 fungicide.

Turf Fungicide®
CHIPCO 26019

TAKING CARE OF BUSINESS

Send to: Rhône-Poulenc Inc.
CHIPCO Fungicide Lawn Care Center
P.O. Box 125 Black Horse Lane
Monmouth Junction, NJ 08852



Please send FREE *How to Sell Lawn Disease Control* booklet to:

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Acme Lawn Care Products

PBI-Gordon Corporation has announced that its new line of Acme Professional Strength Products is now being expanded, according to Don Newhart, Product Manager for the firm's Acme Lawn and Garden division. In addition to Professional Strength Weed-No-More, other Professional Strength formulations include Betasan and Dursban, with Professional Strength Turf Ester being introduced for 1984. One gallon is the standard size for herbicides; the Dursban insecticide comes in one-half gallons.

"The Professional Strength concept was very well accepted by lawn and garden product retailers as well as our targeted end user, the small professional lawn care operator," Newhart reported, "Our Professional Strength product concentrations and package sizes are tailored to their needs, and many of these



buyers find it more convenient to purchase their requirements at a retail outlet in their local trade area." Retailers reportedly have been impressed with the acceptance of Professional Strength Products among commercial accounts, such as cemeteries, estates, schools, and even small golf courses. "This type of business has long been welcomed at garden centers, nurseries, farm supply and hardware stores," Mr. Newhart pointed

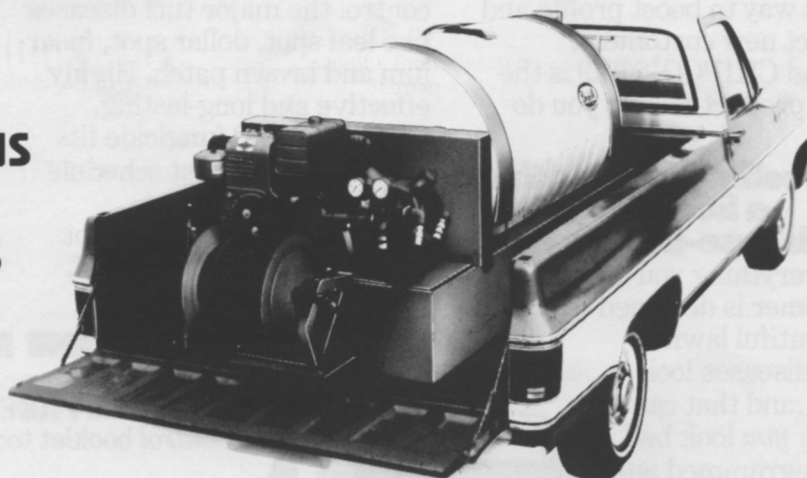
out, adding, "and now the dealer has more to offer these serious buyers." Acme Professional Strength lawn care products are available to retailers through their regular Acme lawn and garden distributors.

For further information, contact the Acme Division, PBI-Gordon Corp., P.O. Box 4090, Kansas City, MO 64101, or use the reply card.

Circle No. 27 on Reader Reply Card

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Fertilizers from top of the line to economical general use, plus custom grades that are prepared to exact customer specifications.

Shaw's product excellence is maintained and guaranteed by strict quality control throughout blending, packaging and shipping.



19-5-9 Turf Food

Shaw's 19-5-9 turf food contains Nitroform, a long lasting organic nitrogen for all season long feeding. It's 4-1-2 ratio along with Shaw's micronutrient additive makes a perfect combination for the highest quality fertilizer we offer.

- Nitroform
- Sulfate Potash
- Trace Package
- Covers 9,500 sq. ft.



28-5-8 Turf Food

Shaw's 28-5-8 analysis is the most economical nitrogen source we know. It contains 7% slow release urea and yields 4.3% sulfur, derived from sulfur coated urea, providing a season extended release of Nitrogen.

- Economical
- Balanced N-P-K
- Contains 25% CSRUN
- Covers 14,000 sq. ft.

All SHAW'S Products are available at these quality distributors:

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(414) 623-2529

Consumers Supply
Storm Lake, Iowa 50588
(712) 732-2922

Eagle Green Corp.
Omaha, Nebraska 68144
(402) 334-8848

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(309) 944-4661

Indiana Seed Co.
Noblesville, Indiana 46060
(317) 773-5813

Lake-Cook Farm Supply
Lake Villa, Illinois 60046
(312) 356-9600

Turf Supplies, Inc.
Taylor, Michigan 48180
(313) 291-1200

UAP Products
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For additional information, write or call:

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In Ohio



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(614) 436-9066

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And you can rest easy with Proxol. Customer's children and pets are not exposed to



TUCO

Division of The Upjohn Company
Kalamazoo, Michigan 49001

a granular residue left on the turf. Proxol is easy on the environment, too. No unpleasant odor to offend customers. No long-term residual buildup in the soil.

Proxol kills grubs and surface feeders. Fast! Over 150 U.S. distributors and 8 regional TUCO Distribution Centers assure convenient product availability. These same sources also have Acti-dione, a TUCO broad spectrum fungicide, long used by golf course superintendents, to stop turf disease problems before they start.

For more information, call toll-free:
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Inside Michigan (collect) —
616-385-6613



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TUCO • Dept. 9510 • 7000 Portage Rd., Kalamazoo, MI 49001

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&

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