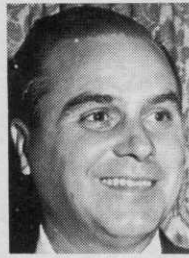


termine this adaptation and acceptance within a specific marketing area. Many of the new varieties will be similar in appearance. Positive identification on the basis of visual morphological characteristics will become increasingly difficult. The value and necessity of sod certification programs, as a means of assurance of genetic identity, will become more evident.

In addition to new turfgrass varieties, other technological advances can be expected. The necessity of staying abreast of new developments will become increasingly important. Various means of gaining turfgrass knowledge pertinent to the production of sod are presently available. Turfgrass conferences and field days, publications such as Weeds Trees and Turf, and membership in state, regional or the national sod producer organizations provide unlimited opportunity for keep up-to-date.

In order to be a part of a rapidly advancing and progressive sod industry, a sod producer no longer can afford to be content with the accomplishments of the 60s but must look forward and be a part of the changes that will be coming in the 70s.



Outlook—'70

Contract Applying

By STAN G. RAPLEE, JR., Washington Tree Service, Inc.
Past President, Pacific Northwest Pesticide Applicators, Inc.

ON OCT. 14, 15, 16, Seattle had the dubious honor of being host to a three-day hearing on the banning of DDT. While no decision will be made until the end of December, we feel there may be some restrictions forthcoming.

The hearings pointed out two things. First, there is a well-prepared group fighting the use of DDT and all chlorinated hydrocarbons. If your state has not yet gone through this, be prepared. Opponents are organized and have a big lead on us. Under such names as "environmental council," they appeal to the public. The news media, while crying they are not biased, most certainly are. They favor headlines. Secondly, we must do something to improve our public image. Because we are mostly small businesses, and unable to do much by ourselves, I

would say one of the most important things that must be done is to at least lay ground work for a national organization in 1970. Our association, Pacific Northwest Pesticide Applicators, Inc., now includes both Washington and Oregon. The job is a big one, but it's the old story of "united we stand, divided we fall."

1970 should be a good year if we do the right things. Our cancellations indicate tighter money. A lot of people still look at spraying of trees and shrubs as a luxury, but most of them will find they have become accustomed to living without insects. They will be back. In the meantime, there are literally thousands of people who aren't aware our service even exists.

The sellers' market we have had the past few years is slowing down. More attention will have to be giv-



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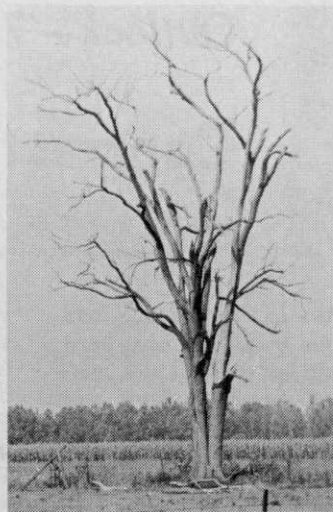


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On the Canadian Side of Lake Erie,

If you're fighting for more budget or seeking more business that's related to Dutch Elm Disease, suggest to the people to whom you're directing your plea that they take a trip across the Canadian side of Lake Erie. The ravages of DED there should easily prove your case. A trip along Highway 3 this summer afforded the traveler a poignant look at the progressive total destruction of elms. Rondeau Park, straight north across Lake Erie from Cleveland, still has a number of healthy elms. But as you travel, east on Highway

3, passing St. Thomas and Tillsonburg, the number of diseased and dying elms increases sharply. The presence of DED is more noticeable in this region because of the high population of elms. The pictures above were made between Tillsonburg and Simcoe. They were taken from one spot by rotating the camera in a full circle. Beginning from the left, the direction is northwest, northeast, southeast, southwest, and west. Elm skeletons diminish gradually as you continue eastward. They've either fallen to the ground or have been removed. A service station attendant at Dunnsville

Contract Applying

en to sales, but resist the temptation to drop prices. It's more important than ever to keep a good set of records, not just for taxes at the end of the year, but also for checking anytime to tell if you are making a profit.

Among other things ahead for us in 1970 is a new concept in education. The Washington Chapter of the Pacific Northwest Pesticide Applicators, Inc., will put on a 10-week course, financed and taught by our own industry.

We shall attempt to teach our employees more of the things we want them to know. In previous years, we have gone through the extension service. This year, because in reality no one knows better than we do which subjects are pertinent, we decided to teach the program ourselves.

If all goes well we hope to expand this into a 20-week apprenticeship course each winter.

One of the best ways to show a good public image is to perform a good service in a professional manner. To do this it is imperative that we send well trained men into the field.

What's ahead for 1970? In summary: a national association, a professional image, more education, and hopefully, of course, to show a profit!

Typical WTT Business Involves Six Operations, Survey Shows

Readers of WEEDS TREES and TURF magazine represent an industry that amasses an estimated \$5.25 billion in sales annually. This projection comes from the more than 30,000 WTT operators whose businesses accrue an average annual volume of \$175,725.

The figures were disclosed in an industry survey conducted this summer. Questionnaires were sent to

2,000 readers, selected at random by computer. A 22.5% response was achieved without follow-up.

The composite business employs 22 persons, indicating a labor force of more than 700,000 in the industry of vegetation management.

Respondents indicated that their businesses are engaged in an average of six different operations. These functions are listed in Table 1. Golf

TABLE 2: TYPES OF OPERATIONS

Question: Which operation listed accounts for the major portion of your business?

	Percent*
Golf Course Superintendent	21.9%
Custom Pesticide Applicator	20.6%
Rights-of-Way Maintenance	16.4%
Arborist	16.4%
Park Maintenance	15.1%
Commercial Turf Maintenance	11.0%
Residential Turf Maintenance	10.5%
Sod Production	6.5%
Other (Miscellaneous)	2.3%

Total 120.7%

*Multiple answers account for the percentage greater than 100.



Dutch Elm Disease Moves Steadily Westward

indicated that town's residents have only memories of elms. Pointing behind the station, he said: "There used to be a whole line of elms along that lake. I don't think there's one in town now. They're working hard on the problem in Ottawa, but I guess they don't have it whipped yet."

The westward march of DED in the United States prompted the Environmental Sciences Council of the Pikes Peak Region to study the problem last year. The group's first report was published in September. The study echoes the apparent frustration at Ottawa — that the history of

Dutch Elm Disease is one of man's inability to prevent its spread. Lacking a cure, the Colorado group advises these delaying tactics: (1) Sanitation practices that will eliminate diseased elmwood where the beetle breeds; (2) a vigorous tree health maintenance program, including, fertilizing and watering; and (3) spraying to coat the bark with a chemical that will kill every visiting beetle and inhibit infection. One state law now in the book in Colorado requires that the bark be removed from any kind of elm wood stored for fireplaces, or any other purpose.

course operation and custom applying account for the greatest portion of business, with other services as indicated by Table 2.

In service-type businesses, the homeowner contract was cited by 37% of the respondents as the fastest growing segment. Twenty-one percent listed governmental contracts from county to federal level. Others listed were: Industrial weed control, 15%; utility rights-of-way, 10%; industrial ornamental horticulture, 7%; and municipal contract, 6%.

Chemicals and fertilizer are widely used and are big annual cost items. Respondents giving figures reported purchasing a total of \$6.4 million in chemicals or an average of \$22,787 per operator. About half of the operators use herbicides and insecticides; 40% use fumigants; 20%, miticides; 14%, soil fumigants; and 9% nematocides.

Operators disclosing fertilizer expenditures reported a total purchase of \$4.7 million or \$17,713 per operator.

Forty-one operators reporting from the random sampling engage in aerial application. Of these, 63.4% use fixed wing; 48.8%, helicopters.

Vegetation management takes a wide range of costly equipment. Op-

erators were asked for the dollar value of their equipment at 1969 prices. Those answering listed total inventory at \$36,192,526, or \$137,093 per operator.

The composite business has this strange array of equipment: 2 aerial bucket lifts, 1 automobile, 1 brush chipper, 1½ golf carts, 1

automatic irrigation system, 1 underground irrigation system not automatic; four mowers of which two are reel and two are any one of five other types, 2 chain saws, 1½ of any one of four different types of sprayers, 1½ tractors, 8 trucks, and any number of 43 other pieces of equipment.

TABLE 1: TYPES OF OPERATIONS

Question: Which of the following operations fit your business?	Percent*
Pesticide Application	69.2%
Fertilizer Application	63.6%
Tree Care	58.1%
Insect Control	57.0%
Turf Management	53.4%
Tree Planting	52.2%
Landscaping	52.2%
Ornamental Care	51.0%
Brush Control	41.1%
Soil Preparation	34.2%
Irrigation Installation	26.0%
Aquatic Weed Control	25.3%
Sod Installation	24.2%
Sod Production	14.0%
Other (Miscellaneous)	5.7%
Total	627.2%

*Multiple answers account for a percentage greater than 100, indicating that an average of more than six different operations are significant in the typical vegetation management business.

Texas A&M Conference Covers the Question:

What Kind of Weed Control?



Industrial weed control isn't a question of "whether" but of "what kind, how much, and what cost?"

Answering the latter three questions often becomes the responsibility—and the opportunity—of weed control specialists, for industry management isn't always certain of what kind of control is needed.

That's a summation of the Fourth Annual Industrial Weed Control Conference sponsored by Texas A & M University, College Station. About 150 persons representing the various aspects of the weed control industry met to contribute toward the conference's three-fold objective of the kind, degree and cost of weed control.

Before the nuts and bolts sessions got under way, a U.S. Department of Interior official stated his agency's policy on pollution, a watchword for the entire chemical industry during the 70s.

Victor W. Lambou, of the Interior's water pollution section, said the policy is this:

—Restrict pesticide use to situations where there is no suitable alternative;

—Use the safest pesticide at the lowest effective rate;

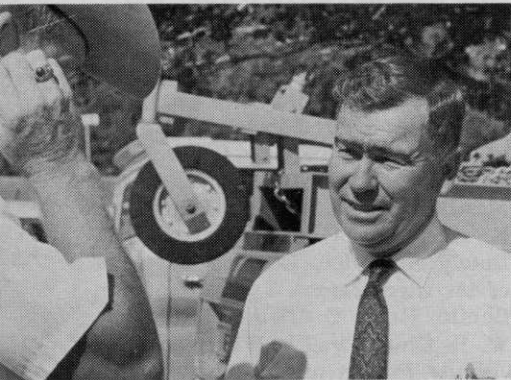
—Phase out the more persistent pesticides, such as DDT, when effective substitutes are developed; and

—Eliminate immediately those persistent pesticides considered most hazardous to fish and wildlife.

Lambou reminded that pesticides used in interstate commerce must be



Field demonstrations of both mechanical and chemical control of weeds and brush wound up the Texas A&M conference. Buddy Wolfe, using a John Bean sprayer and Stull Chemical Company's invert emulsion, manipulated the foam-like solution from fogging to a concentrated stream reaching out more than 100 feet. Cliff Ennis of Engler Manufacturing, demonstrated a slope mower for problem areas.



Dr. Wayne G. McCully of Texas A&M was conference chairman.

registered. He also reviewed the re-registration of chemicals that is now going on.

Chemical manufacturers must prove by Dec. 31, 1970, that their pesticides at certain residue levels meet the safe-use criteria established by the government. Failure to meet the new standards means the product will not be re-registered and in effect be banned from use.

Herbicides that are intended for use in and around water, he said, must be backed up with toxicity data and residue data for irrigated crops, meat, poultry, eggs, fish, shellfish, and potable water.

Some companies, Lambou said, "may find it not economically feasible to get the data, so some labels may be withdrawn."

Panelists covered about every method of weed control, but generally concluded that the most effective and least-cost approach was to establish a continuing program.

An example came from R. L. Robinson of the Texas Electric Service Company. Robinson's program beneath high-line towers and inside sub-station yards is to apply 20 lbs./acre of diuron the first year, 15 lbs. the second year, and 10 lbs. every year thereafter.

An experiment of cutting down to 8 lbs./acre "to really save some money," Robinson said, has meant instead that he must begin again with first-year rates. He set the cost of the continuing program at about \$100 per acre.

Some comparative costs for maintaining a pipeline right-of-way were reported by Howard S. Bell of Shell Pipeline Company of Houston.

Cost of pipeline maintenance as related to weed control, he said, is tied to the access needed, visibility required, and the degree of protection necessary to avoid fire and erosion damage.

Bell presented these per-mile costs for maintaining a 60-ft. right-of-way: \$50 for mowing ground cover; \$200 to \$300 for chemical spraying of ground cover; \$200 to \$300 for aerial control of canopy; \$410 to \$600 for ground spray of canopy and side trim; \$570 for mechanical canopy and side trim.

Aerial application presents both unique disadvantages and advantages, he said. Among disadvantages, he cited:

—aircraft use restrictions because of varying county regulations;

—application rates that must insure three to five times longer control, enabling the spreading of application cost over several years to make it pay out; and

—added danger of damaging adjacent field crops.

Among decided advantages:

—Since timing of application is critical, aerial application can complete the job quickly enough to achieve maximum efficiency.

—Aerial application can bring control to otherwise inaccessible areas.

Boosts for aerial application, Bell added, have been invert emulsions to minimize drift, refined application equipment such as the micro-foil boom, and chemicals with broader control spectrums.

Concurrent panel sessions dealt with weed control methods around plant sites and parks, roads and streets, railroads, water and ditchbanks, and so on.

Methods ranged from spraying and mowing separately, or spraying in conjunction with mowing, searing then reburning with either fuel oil or propane, one-time burning, herbiciding and burning, dredging, to designing facilities at the outset to ease maintenance costs or eliminate the need for weed control entirely.

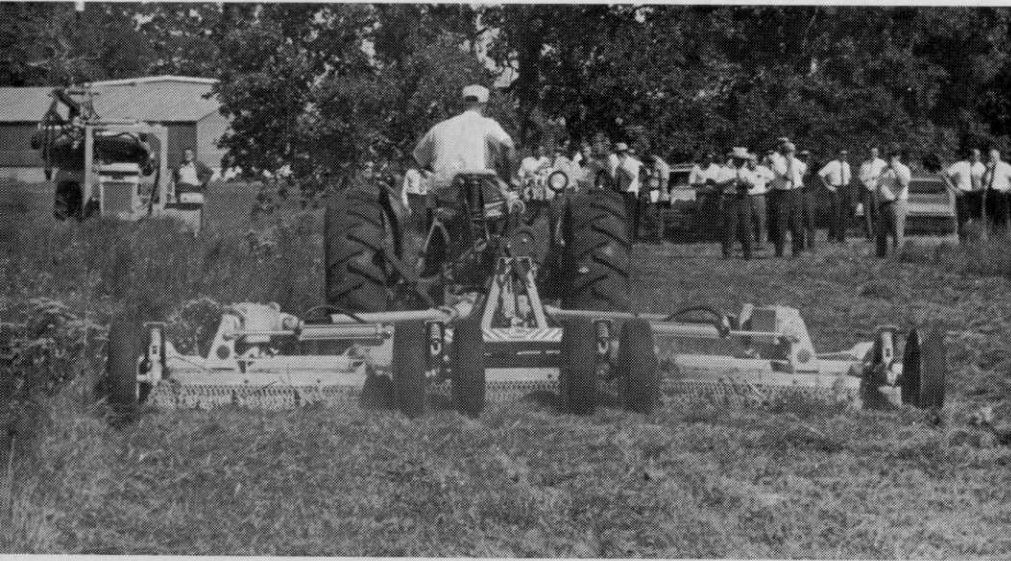
Use of mulches, selective herbicides, or just plain concrete around such obstructions as utility poles, trees, mailboxes, traffic signs, fences, etc., can reduce mowing costs significantly.

Using the right chemical is critical, warned several speakers, or else you can produce a bigger problem. For example, a water-soluble soil sterilant used on a highway right-of-way could bring on roadbed erosion.

"Weed control has become a sci-



The talking point for this 1,000-gal. spray tank is its baffle construction. The two halves are molded separately then sealed together in tongue-and-groove fashion, adding strength, say Red Ewald, Inc., representatives. The spray rig comes with 100 feet of hose. The company is headquartered at Karnes City, Tex.



Grass and some weeds up to three feet high enabled mower companies to demonstrate the maximum effectiveness of their machines. The top picture shows a Servis rotary mower; the bottom, a Caldwell flail mower.

ence of prescription," pointed out Turney Hernandez of duPont. You must define your objective, he explained, in terms of whether you want bare ground, abatement, selective weeding, chemical trimming, or weedy plant control.

If the work is to be done through contract, it is important, said one applicator, that bids are asked for and evaluated on similar specifications.

Concerning vegetation management through mowing, as with chemicals, there is a "best-suited" and "most economical" machine for a particular need, said Cecil Willis of the Houston Parks Department.

"I personally prefer the flail-type mower because of the safety factor," he said. "But regardless of type of mower used or money and equipment available, if you cannot main-

tain what you have created, you have defeated your goal in vegetation management.

"Let quality control and ease of maintenance be your guides."

Safety will become a stronger factor in mower selection in Texas when a liability law goes into effect at the beginning of the year. The law makes the state vulnerable to suit over personal injury or property damage caused by mowers.

Conference sessions closed with a panel of industry representatives reporting on the latest chemicals and equipment in use for vegetation control. Some of these products were demonstrated the final afternoon of the three-day conference.

Dr. Wayne G. McCully of Texas A & M was conference chairman. His program committee consisted of Robert Haas, Garlyn O. Hoffman,

B. J. Ragsdale, E. D. Robison, Allen F. Wiese, and Lambert Wilkes.

The new advisory committee is: Gene Bockholt of Houston, Otha Birkner of Bay City, Tom Mobley of Kilgore, Dave Yazell of Albuquerque, N. M., Henry Steiner of McAllen, J. D. Maples of Houston, R. L. Robinson of Ft. Worth, J. C. Bouvy of Tyler, Clifford E. Cross of McAllen, James D. Grant of San Benito, Huett C. Cloud of Houston, W. R. Churchwell of Plainview and Johnny Pustka of Rosenberg.

Hercules Says Toxaphene Is Not a 'Hard' Pesticide

Toxaphene is a different kind of chlorinated hydrocarbon pesticide, claims its manufacturer, Hercules, Inc., Wilmington, Del.

Recent publicity about the so-called "hard" pesticides has resulted in a rash of inquiries about toxaphene, said a company spokesman. To clear the air, a news release has been distributed to explain how toxaphene is different.

To begin with, toxaphene is made from the gum of southern pine trees; other chlorinated hydrocarbons are petroleum-based, the company stated.

Toxaphene is not persistent, listing 10th in residue occurrence of the ten most widely used pesticides, according to Food and Drug Administration surveys.

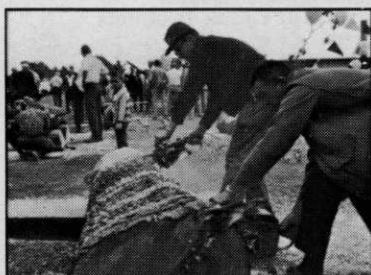
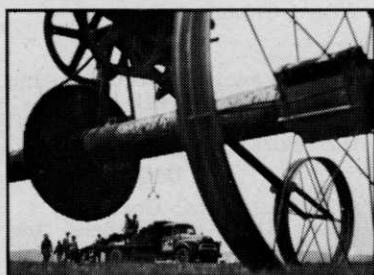
The Hercules release says that USDA tests have shown that toxaphene actually de-magnifies in the food chain. And since it does not magnify biologically, it cannot become toxic through increasing levels of magnification, the statement concludes.

"Most chlorinated hydrocarbons are, to varying degrees, toxic chronically," the company release stated, "however toxaphene is not. It produces, for example, no toxic effects in chronic feeding studies at 25 ppm, compared with 1 ppm for DDT and 0.5 ppm for dieldrin.

"In fact, when toxaphene-organo-phosphate combinations have been used to replace organo-phosphates alone, acute toxicity hazards to the applicator and wildlife have been reduced."

A half-dozen institutions were listed as having done research on toxaphene. The product has been in commercial use for more than 20 years, the company spokesman said.

WEEDS TREES and TURF[®]



Weeds Trees and Turf presents in this section its annual guide to suppliers of vegetation control chemicals and equipment in urban/industrial areas. There is a mixture of common and registered trade names, unavoidable since usage and recommendations of researchers refer to a particular chemical by one or the other, depending upon the newness of the compound, whether its common name is easier to use, or industry acceptance. There also will be some differences of opinion over the inclusion or omission of certain chemicals under particular use categories. Here again confusion exists among reference sources. We have made our choices on the basis of most frequent mention in our surveys which preceded this compilation. Readers' comments and suggestions are invited to help us improve future editions. Keep this year's guide handy for frequent use.

An index to editorial content for 1969 follows the Suppliers' Guide. Subjects and titles, cross-referenced, are listed for all major features, news stories, conference reports, editorial opinion, columns and letters. Contributing editors are listed at the end of the index.

1970 Suppliers' and Equipment Guide ● ARTICLE INDEX

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Amchem Products, Inc.
W. R. Grace & Co.
Nalco Chemical Co.

AMMONIUM SULFATE

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W. R. Grace & Co.
Phillips Petroleum Co.
Summers Fertilizers, Inc.

ASSULT

West Chemical Products Co.

ATRATOL

Geigy Agricultural Chemicals

ATRAZINE

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Geigy Agricultural Chemicals
W. R. Grace & Co.
Great Lakes Chemical Div.
Hub States Chemical & Equip. Corp.
Nalco Chemical Co.
O. M. Scott & Sons Co.
Southern Mill Creek Products Co., Inc.
U.S.S. Agri-Chemicals Div.

BORATE COMPOUNDS

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Chipman Div., Rhodia Inc.
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Green Lawn Laboratories, Inc.
Nalco Chemical Co.
Southern Mill Creek Products Co., Inc.
U.S. Borax & Chemical Corp.

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Green Lawn Laboratories, Inc.
Nalco Chemical Co.
U.S. Borax & Chemical Corp.

BO-RID

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Hub States Chemical & Equip. Corp.

BOROCIL IV

U. S. Borax & Chemical Corp.

BROMACIL (HYVAR X)

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E. I. duPont de Nemours & Co., Inc.
Hub States Chemical & Equip. Corp.
Nalco Chemical Co.
Southern Mill Creek Products Co., Inc.
Stull Chemical Co.

CALCIUM CHLORIDE

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Fence Painter Corp.
Pittsburgh Plate Glass Co.

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Nalco Chemical Co.
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Nalco Chemical Co.
Southern Mill Creek Products Co., Inc.

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ERBON

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Nalco Chemical Co.

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Nalco Chemical Co.

FENATROL

Amchem Products, Inc.

HCA

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Southern Mill Creek Products Co., Inc.

HIBOR

U.S. Borax & Chemical Corp.

MBG

Hooker Chemical Corp.

MONOBOR-CHLORATE

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Southern Mill Creek Products Co., Inc.
U.S. Borax & Chemical Corp.

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Nalco Chemical Co.

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Chapman Chemical Co.
Chevron Chemical Co., Ortho Div.
Chipman Div., Rhodia, Inc.
The J. J. Dill Co.
Green Lawn Laboratories, Inc.
Miller Chemical & Fertilizer Corp.
Niagara Chemical Div., FMC Corp.
Pennwalt Chemicals Corp.
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Green Lawn Laboratories, Inc.
Hooker Chemical Co.

Nalco Chemical Co.
Pennwalt Chemicals Corp.

TBA

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Nalco Chemical Co.

TCA

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Amchem Products, Inc.
The J. J. Dill Co.
The Dow Chemical Co.
Fence Painter Corp.
Nalco Chemical Co.
Robeco Chemicals, Inc.

TRITAC

Great Lakes Chemical Div.

TRITAC-D

Great Lakes Chemical Div.

URAB

Allied Chemical Corp.

UREABOR

Green Lawn Laboratories, Inc.
Southern Mill Creek Products Co., Inc.
U.S. Borax & Chemical Corp.

UROX

Allied Chemical Corp.
Green Lawn Laboratories, Inc.
Southern Mill Creek Products Co., Inc.
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VACATE

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VAPAM

Stauffer Chemical Co.

WEED OUT

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Ross Daniels, Inc.
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W. R. Grace & Co.
Great Lakes Chemical Div.
Green Lawn Laboratories, Inc.
Hub States Chemical & Equip. Corp.
Niagara Chem. Div., FMC Corp.
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Stauffer Chemical Co.
Thompson-Hayward Chemical Co.
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Velsicol Chemical Corp.

CIPC

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Diamond Shamrock Chemical Co.
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Fence Painter Corp.
W. R. Grace & Co.
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Southern Mill Creek Products Co., Inc.
Thompson-Hayward Chemical Co.
U.S.S. Agri-Chemicals Div.

DIPHENAMID

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W. R. Grace & Co.
TUCO Products Co.

DNBP

Aceto Chemical Co. Inc.
The Dow Chemical Co.
W. R. Grace & Co.
Niagara Chemical Div., FMC corp.

DYNAP

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DYMID

Elanco Products Co.

ENDOTHAL

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W. R. Grace & Co.
Pennwalt Chemicals Corp.

EPTAM

Boyle-Midway Div.
The J. J. Dill Co.
W. R. Grace & Co.
Southern Mill Creek Products Co., Inc.
Stauffer Chemical Co.
Thompson-Hayward Chemical Co.
U.S.S. Agri-Chemicals Div.

HERBAN

W. R. Grace & Co.
Hercules Incorporated
Summers Fertilizers, Inc.
Thompson-Hayward Chemical Co.

HERBISAN

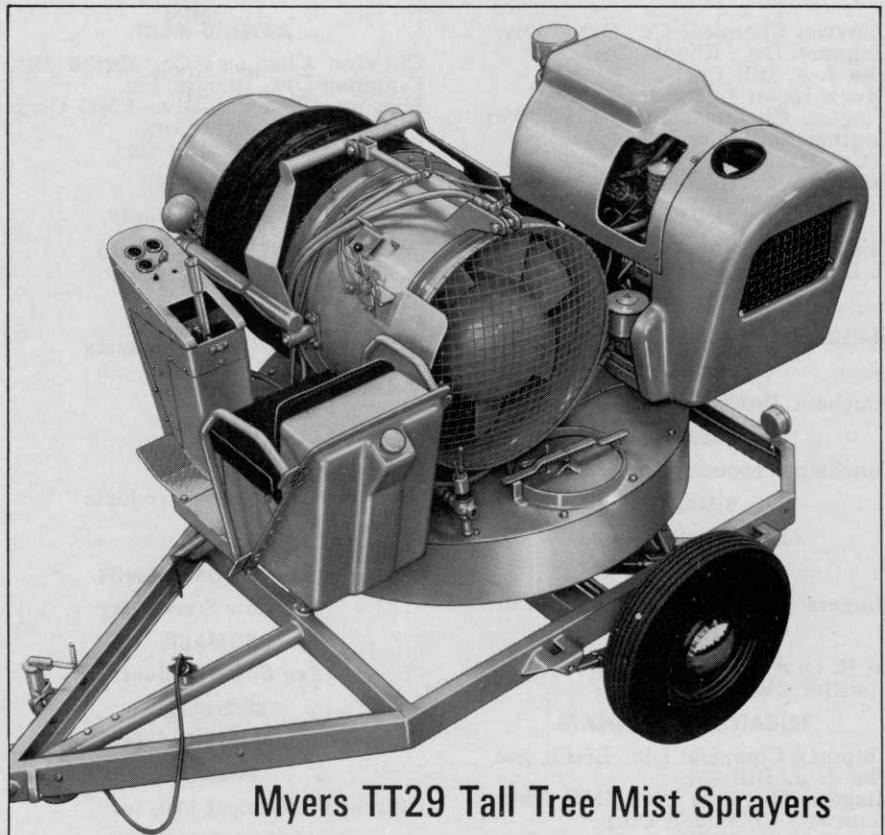
Roberts Chemicals, Inc.

IPC

Aceto Chemical Co. Inc.
Pittsburgh Plate Glass Co.

LEAD ARSENATE

Aceto Chemical Co. Inc.
Allied Chemical Corp.



Myers TT29 Tall Tree Mist Sprayers

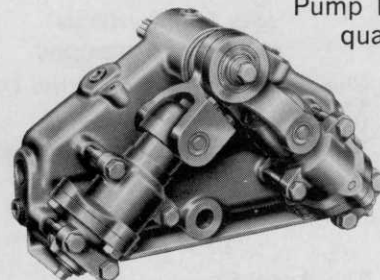
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(See Soil Sterilants)

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Nalco Chemical Co.

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W. A. Cleary Corp.
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Great Lakes Chemical Div.
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Nalco Chemical Co.
Southern Mill Creek Products
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Vineland Chemical Co.

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Chevron Chemical Co., Ortho Div.

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Hub States Chemical & Equip. Corp.
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