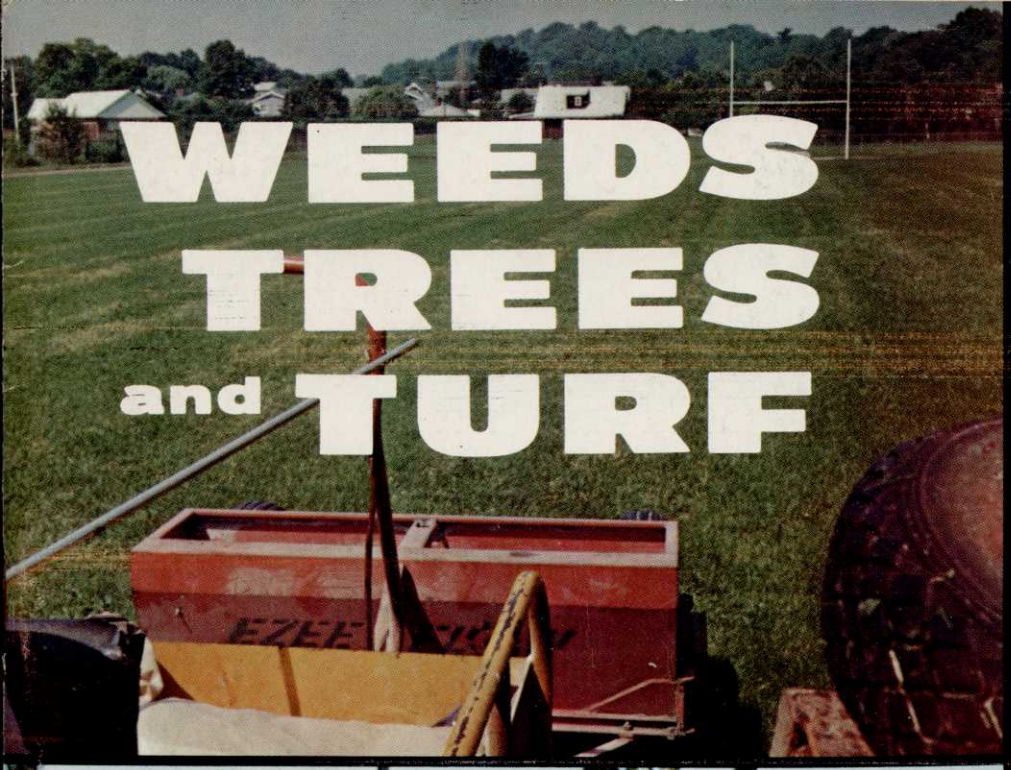
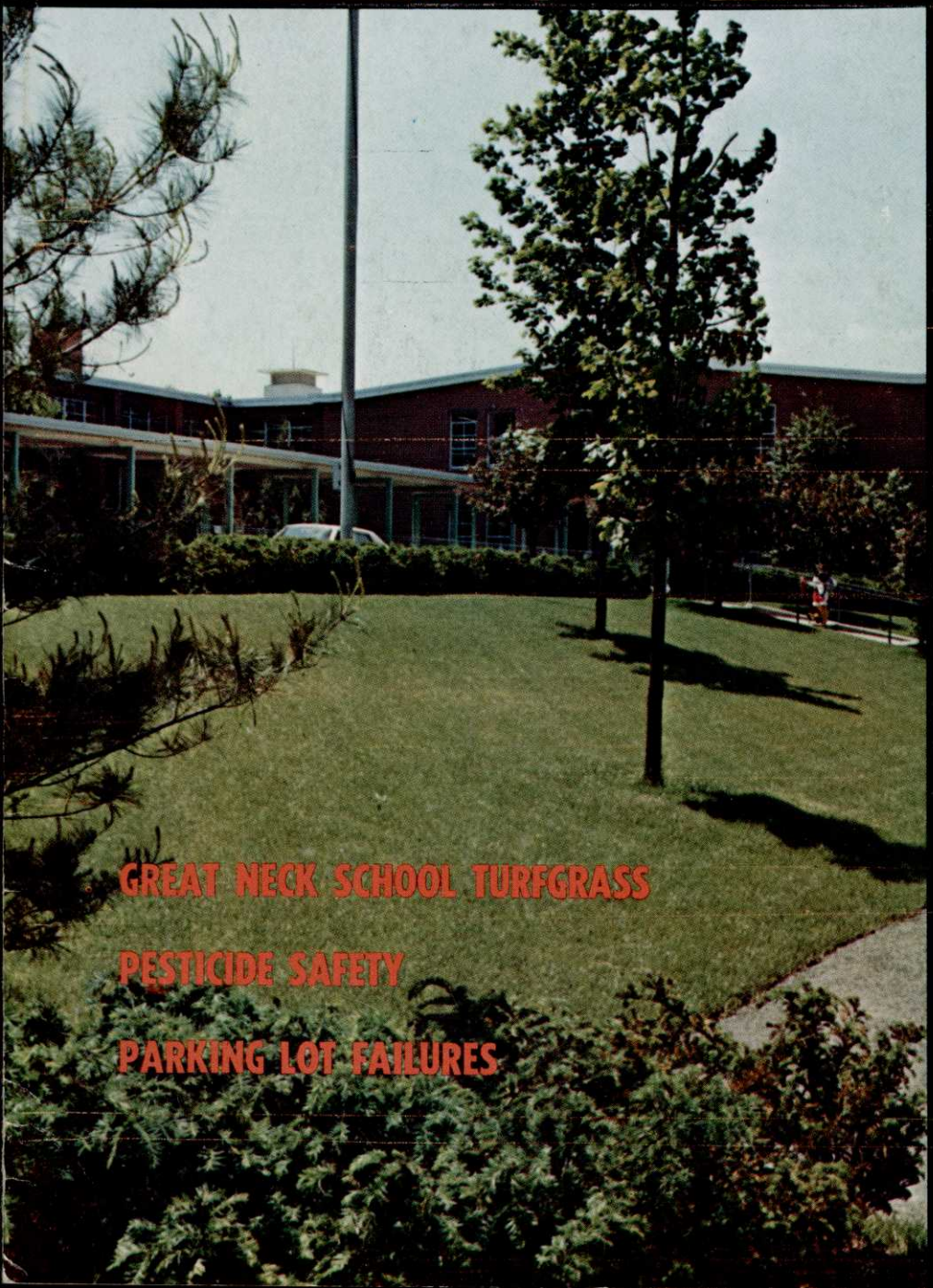
WEEDS TREES and TURF

NOVEMBER, 1971





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WEEDS TREES and TURF®

Volume 10, No. 11 November, 1971

The Cover

The many and varied needs of the grounds at Great Neck Public Schools in Long Island, New York, are matched with an equally varied, large-scale turf management program. Building and grounds director Joseph J. Bazzani, who unfolds his story on this program beginning on page 8 of this issue, says the Great Neck approach is two-fold: Use of the latest techniques in landscaping for utility and aesthetics and in record keeping for efficiency and economy. Mainenance is based on the thought, "If you do not intend to maintain school grounds, you should not develop them."

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Editorial

Environment Management

Our so-called "Green Industry" is charged with maintaining the environment — insofar as spreading "greenbelts" about is concerned. This is good.

We now have the public conscience on our side in that they are aware of the esthetic values. The public wish today, is without doubt to upgrade the environment and to do so in such fashion as to maintain the ecology for us and for the future. We have public support in this.

We have certain pluses in our favor: (1) EPA must be credited with a more realistic approach to chemical use than anticipated; (2) the public apparently is now more willing to study the problem rather than react emotionally. The emotional crisis, generated by rash statements with almost no attempt at documentation, seems less serious at the moment. Such voices of public figures and quasis scientists (some of whom are still around) enjoy less publicity. (Actually, they overplayed their hands very early in the game); (3) manufacturers have marshalled their forces via research and public relations efforts; (4) more support has been forthcoming from the University family; (5) biological control as an immediate solution is now publically viewed as a more distant supplement tool; and (6) more people today are aware of the role of pesticides in providing our voluminous and high quality food supply, and the further role of pesticides in conservation, disease control, etc.

Thus, our job becomes largely the responsibility for environmental management — both to sell the program and to carry it out. We haven't won yet, but we now know that the collective industry can do so. We are making strides — and big ones.

For example: utilities are developing a new look for rights-of-way. Power lines are being built below the crests of hills, and natural vegetation left and maintained for beauty and for wildlife; highway planners blend rights-of-way into natural surrounding and plan trees and shrubs for both beauty and utility; city planners look with favor on shopping centers and other developments which include lots of green; new turfgrasses, new tree varieties, and a wealth of new equipment to maintain them are on the market; and much more astute press and other media, have all helped.

We have a responsibility to use pesticides carefully-and not to MISUSE them. A few careless operators can hurt the entire industry. Because, today, news travels fast — and across the nation.

Another plus we enjoy is that pestilence (weeds, insects, and disease) constitutes a common denominator. Everybody, everywhere, is plagued.

Government News / Business

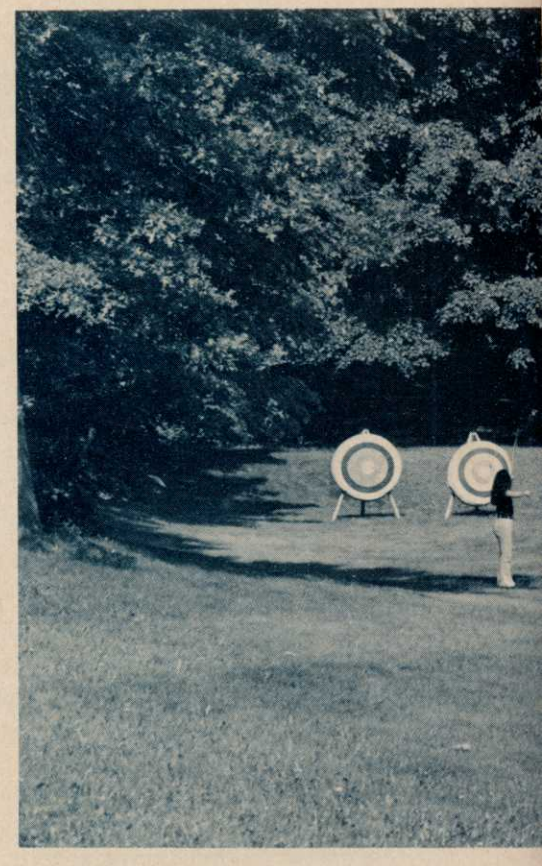
Gypsy Moth Sex Lure The Federal government is putting up $370,000 in a joint venture with Pennsylvania Agricultural Experiment Station to test potential of the new synthetic sex lure for gypsy moth. Penn State is contributing $22,000 for the planned 2-1/2 year study. Agriculture Research Service researchers reported discovery of the chemical identity of the lure last November, then synthesized the natural attractant, named disparlure.

Puerto Rico's Proposal Introduced in the Puerto Rico legislature and almost certain to pass its first test in the Puerto Rico House is a bill banning almost every chemical commonly used for control of weeds, insects and disease. In addition, there are heavy restrictions in the measure on aerial spraying, use of aerosols, etc.

New Insecticides Tested The USDA has reported experimental tests on 24 materials which they report equal to or better than DDT for face fly control. Five of the insecticides proved equal to or better than malathion which was used for comparison in tests with DDT-resistant house flies. Results are available in Production Research Report 132, Laboratory Evaluations of Candidate Insecticide Residues Against Face Flies and DDT--Resistant House Flies, 1961-69, from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Price is 40 cents.

Dow Files Objection Dow Chemical Company has charged the Environmental Protection Agency with failure to issue a definitive order relative to cancellation of certain restrictions for 2,4,5-T as required by law. Dow's action follows EPA announcement August 10 that final determination in the 2,4,5-T case would be delayed until after a fall public hearing. Dow claims cancellation action was improper and deprives the company of due process and its right to a prompt decision. Dow's director of government regulatory relations, G.E. Lynn, says no evidence has yet been introduced indicating hazards to health or environment resulting from normal use of the chemical in agriculture or industrial applications.

EPA Begins New Review William D. Ruckelshaus, EPA administrator, has initiated a review of all pesticides containing either chlordane or heptachlor..."to determine if any are endangering the environment." He said that, "If we find that any of the registered products raise substantial questions of contamination of the environment, I will take action to cancel the registration of the product." Cancellation, of course, could ban the product from interstate shipment, although the initial notice simply sets in motion the review mechanism when there is an appeal. Products of particular concern are those which include soil insect control, household insect control, termite control, foliage insect control, and lawn management.



LARGE-SCALE TURF MAINTENANCE

—Care and Cost

By JOSEPH J. BAZZANI

Director of Building and Grounds
Great Neck Public Schools
Long Island, New York

THE QUEST for excellence in the grounds maintenance program at Great Neck is literally a "grass roots" commitment. With 250 acres in buildings, woodlands, and grounds, some 80 acres are in turfgrass. Operating on the basis that "if you do not intend to maintain school grounds, you should not develop them", our program to maintain these grounds is designed around the latest techniques in landscaping for utility and aesthetics and in record keeping for efficiency and economy.

A good turf maintenance program is vital to achieve this goal. It consists of seeding, fertilizing, mowing, irrigation, the use of pesticides in weed and disease control, cultivation, and trimming. In total, these things do not always conjure pictures of green grass and flowering shrubs. Those less concerned with aesthetics are, however, always interested in costs. The aesthetics and cultural care of good turfgrass are covered by the captioned picture story. The discussion is directed toward the record keeping required to evaluate costs.

Begin with the premise that qualified and interested personnel and proper tools and equipment are essential to the operation that attains a goal of excellence. It is not enough to annually ask for adequate staff and equipment. There is a responsibility to keep records and to furnish the information that will substantiate such requests. Standards should never be the least acceptable—they should be set at a professional level and the support for them must be aggressively sought.

This simple application of record keeping is recommended as a base from which the needs of each district will indicate the necessary degree of expansion of the system. It has been proved that, all other things being equal, a high quality maintenance level will be achieved, at no additional cost, where there is an efficient record keeping system. The following information is offered as a budget guide to the five major areas of turf maintenance costs. It is based on a recent study made by Economics Research Associates of Los Angeles, California, for Thompson Manufacturing Company. The percentages allow in general for the

Grounds at the Great Neck Public Schools are a study in variabilities — usefulness and aesthetics. With good turfgrass, athletic fields and playgrounds can be used under most weather conditions. Grass areas are safer for play, resulting in fewer skinned knees and elbows (below) while large athletic fields (above) are used for a variety of activities.

differences found in the various geographical areas.

Labor consists of wages, salaries and fringe benefits. It is the most substantial component of turf maintenance expense and it runs anywhere from 55% to 75% of the total cost. Therefore any improvements in the methods used will have a significant effect in decreasing the cost of the operation.

Water Costs are relatively stable and easy to record. For instance, in my school district there are two water companies which service our schools. One charges 25 cents per 1000 gallons, the other 75 cents per 1000 gallons. This usually runs 5% to 26% of the total cost.

Supplies for turf care include such items as fertilizer, lime, seed, herbicides and fungicides, gas, oil, and topsoil. This usually runs about 4% to 17% of the total costs.

Equipment repair and replacement include parts and repairs necessary to maintain equipment. Purchases of equipment should be prorated for the life of the equipment. These costs usually run from 4% to 18% of the total cost.

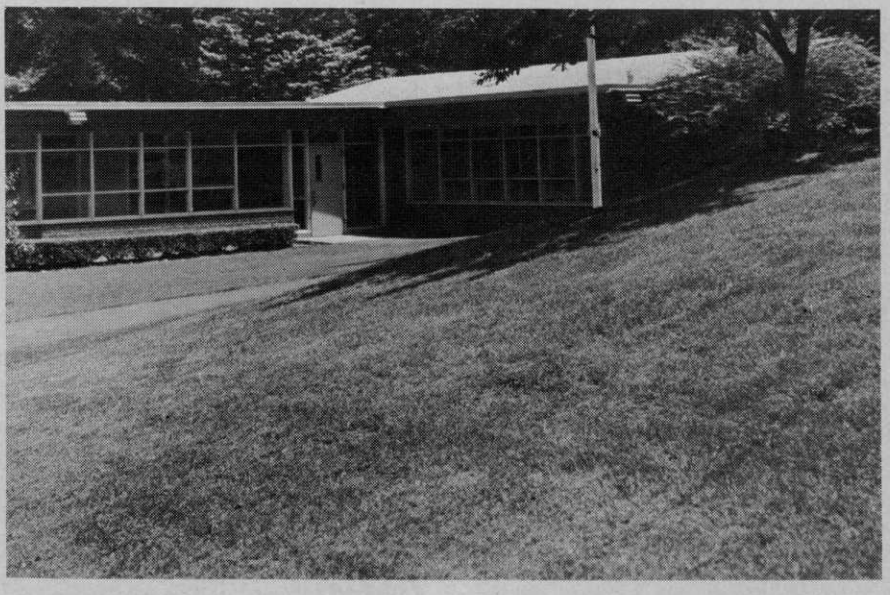
Miscellaneous: These costs are usually more difficult for a school district to assess, since they include such items as depreciation, general insurance, and utilities. They run from 1% to 3% of the total costs.

For implementation it would be necessary to identify on a per acre basis the five cost classifications as they relate to specific maintenance operations. If a "do it yourself program" is to be developed, daily records may be kept on a weekly chart for each classification by function. The charts would provide the detail needed to analyze costs of labor, equipment repair, and supplies by area. The utilities including water, insurance, taxes, equipment depreciation, and other miscellaneous items that are fixed costs can be broken down to a daily and weekly rate. From a total cost analysis such as this, an internal cost comparison can be made as well as a comparison with costs from other geographical areas.

The application of some form of simple record keeping system can be helpful in determining the true costs involved in a meaningful turf maintenance program. Armed with these figures and with the aesthetic arguments for enhancement of school environments and the appealing and functional nature of grass areas, when discussing annual budgets, it creates the proper climate allocating the necessary funds needed to do this job.

Properly cared for and adequately fed, grass can thrive in this shade or withstand heat buildup near brick and glass in other areas.

A nursery honoring Edwin F. Harper, superintendent from 1930 to 1959, is an example of ecology work in addition to large turf areas. Joseph J. Bazzani, left, talks here with Al B. Wyatt.



Grass can be useful in providing erosion control for sloping areas as well as an element in good landscaping design.

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HERBICIDE SAFETY

An Attack on Ignorance and Carelessness

By DR. BLAIR BAILEY
Pesticide Safety Specialist
University of California, Berkeley

WE are experiencing poisonings caused by herbicides. These are caused by carelessness, or ignorance, or both. Those guilty of either or both of these two counts will not be pleased to hear the charge made. But what of the lives—human or animal—of those endangered by improper handling of herbicides?

Every worker handling toxic materials should be advised of possible danger to him, and should be instructed on correct rates of application and proper protective measures.

Possibly more important than this is to tell workers in advance what to do in case of a severe splash or spill of the concentrated chemical into eyes or onto skin.

An example of the cases of poisoning reported, what types of poisonings they were, and what types of herbicides caused them, is offered by California. The State Department of Public Health, Bureau of Occupational Health, issues an annual report entitled "Occupational Disease In California Attributed to Pesticides and Other Agricultural Chemicals." The types of poisonings included in a recent report fall into three catagories:

1. systemic poisoning
2. respiratory condition
3. skin conditions

This report lists 66 cases of poisoning attributed to herbicides and defoliants. However, there were also 18 additional cases attributed to phenolic compounds which may very well have been caused by herbicides such as pentachloropphenol, DNBP, and related materials. Therefore, there probably were more than 66 cases of herbicide poisoning. And there may be even more, because not all cases of pesticide poisonings are reported—only workers covered by Workmen Compensation insurance are included, as required by law.

Five of the 66 known herbicide poisonings were of the systemic type, which is often severe but rarely fatal.

There were 10 reports of respiratory conditions, and 57 of skin conditions. The latter conditions can cause the victim pain and loss of work.

About 500 reports of "eye conditions" and "chemical burns" were reported by physicians but not tabulated because of lack of clerical help. However, a review of a prior year's report showed that approximately 100 chemical burns and eye conditions were attributed to herbicides. I believe that it is obvious that there is a gross under-reporting of pesticide poison cases.

In the report in question there were no occupational deaths recorded or attributed to pesticides. This is only the third year in the 18 years of these reports that we have no record of such deaths. However, in previous years herbicides such as sodium arsenite, pentachlorophenol and paraquat have caused accidental death of a number of humans and livestock. These deaths occurred because someone was ignorant or careless and left chemicals where they could be accidentally consumed by humans (mostly children) or by livestock.

Eating or drinking pesticides, often from unlabeled containers, including soft drink and wine bottles, has been the main cause of accidental deaths of a number of children as well as adults. So, the rule is to keep all pesticides in their original l a b e l e d containers and locked at all times when they are not being used by a trained person.

Not all deaths from pesticides are caused by eating or drinking them from a container. In the past few years throughout the country, at least 95 cattle have died from grazing on grass which had received accidental drift of arsenical herbicides from near-by spraying operations. Arsenic trioxide and sodium arsenite were the materials most frequently causing these deaths. However, one of the newer organic arsenicals, MSMA, caused the deaths of a two-year-old girl and 41 beef cattle during 1967-68.

Pesticides can enter the body in any one or all three of the following ways:

1. through the lungs—by inhalation
2. through the mouth—by ingestion
3. through the unbroken skin—by absorption

Occupationally, the most common route of absorption is through the skin. However, under certain working conditions, inhalation is also an important route of entry.

Oral ingestion of pesticides by workers has not occurred often.

You do not have to be a toxicologist to know how toxic or hazardous a pesticide is. You simply read the label on the container and look for certain key words such as "DANGER" "POISON" "WARNING" or "CAUTION." These "signal words," and in some cases the skull and crossbones symbol, will provide the approximate toxicity rating of the chemical in the container.

Toxicity ratings are as follows:

1. The signal words "DANGER," "POISON," and the skull and crossbones symbol are required on the labels for all highly toxic compounds. These materials all fall within the acute oral LD_{50} range of 0 to 50 mg/kg.

2. The word "WARNING" is required on the labels for all moderately toxic compounds. These materials all fall within the acute oral LD_{50} range of 50 to 500 mg/kg.

3. The word "CAUTION" is required on the labels for all slightly toxic compounds. These chemicals all fall within the acute oral LD_{50} range of 500 to 5000 mg/kg.

4. No special signal words or symbols are required on labels for compounds that have an acute oral LD_{50} greater than 5000 mg/kg. However, unqualified claims for safety are not acceptable on any label and all labels must bear the statement "Keep out of the reach of children."

ASPHALT PARKING LOTS —HOTHOUSE FOR WEEDS

California parking lot specialists Jerry Krizman, left, and Leland May.

WEEDS are perhaps the greatest cause of asphalt parking lot breakdown, according to a pair of California parking lot specialists. Despite several inches of asphalt, and soil preparation which includes blading and compaction, weed seeds can germinate and extend an upward force of 1700 pounds per square foot, quickly breaking through the asphalt.

Asphalt works like a hothouse, says Jerry Krizman of California Weed Control — Industrial. "It's moist and warm underneath. Weeds thrive and soon exert enough pressure to break through the blacktop.

"And once a hole gets into asphalt," Krizman emphasizes, "you can bet that it's going to get larger."

That's why parking lot maintenance costs can be substantially reduced by the use of a pre-emergence herbicide applied just before the asphalt is laid. In fact, more and more contractors and municipalities are requiring this as part of their specifications.

"Use of a soil sterilant or pre-emergence herbicide is an insurance policy against premature asphalt breakdown," adds Leland May, also a partner in the custom application firm. "For example, in Ontario and many other California cities, all city streets must have a soil sterilant treatment. That's the trend today."

Typical specifications state: ". . . Prior to placing any surfacing material the subgrade shall be completely sterilized by application of an approved weed killer applied in accordance with directions and recommendations . . ."

For the past 12 months Krizman and May have been participating in an experimental herbicide program with CIBA-GEIGY Corporation. They have used Pramitol 25E, a liquid concentrate pre-emergence herbicide on more than a dozen parking lots with excellent results.

The tests are being conducted to provide Geigy and prospective users with additional information on the effects of the herbicide under asphalt prior to marketing the product for use in such asphalt applications. Pramitol is presently widely used as a pre-emergence herbicide for other industrial and non-crop uses.

As a subcontractor, California Weed Control must guarantee its work for at least 12 months and sometimes 24 months. To date, they have had no failures with Pramitol and as long as proper application procedures are followed, they do not expect any.

In past years, California Weed Control has used granular Polybor-

A typical parking lot is bladed to remove existing weed growth and compacted for better surface — prior to application of herbicide and asphalt. Pramitol 25E is applied on the ⅓-acre parking lot below in less than an hour, with difficult areas sprayed by hand.

An hour after herbicide was applied to the parking lot, an asphalting crew went to work. The herbicide used is designed to cling to soil particles and not leach out from under asphalt. As a pre-emergence it is used to kill weeds before they are large enough to damage asphalt.

Chlorate herbicide at 800 lbs, per acre in 800 gal. of water. Although it gives results comparable to Pramitol, the excessive bulk of the herbicide, high volume of water and constant agitation necessary make it undesirable.

The large amount of Polybor-Chlorate requires greater warehousing facilities and greater handling time, both resulting in higher labor costs. Since Polybor-Chlorate also requires a much greater volume of water, in the arid Southwest this means bigger equipment to haul the water. This is especially time-consuming when the work site is far removed from headquarters.

Pramitol 25E has been used at 20 gal. per acre in 100 gal. of water. When especially hard-to-kill weeds are encountered or a two-year weed control guarantee is required, the rate may be increased to 30 gal. per acre. At these rates, the costs of Pramitol per acre is about the same as Polybor-Chlorate, but the overhead and labor involved are much reduced with Pramitol.

California Weed Control's most recent job involved a one-third acre parking lot in a retail development in Riverside, Calif. The adjacent vacant lot was covered with deep-rooted, hard-to-kill weeds which could have presented control problems in the new parking lot.

The lot had previously been bladed to remove any existing weed growth and then compacted for a better surface. Using a specially rigged spray truck, the herbicide was applied about an hour before the lot was asphalted.

Seven gallons of Pramitol 25E was applied in 150 gallons of water with only minimum agitation required. The entire application — including hand spraying of hard-to-reach corner areas—was accomplished in less than 45 minutes.

To achieve the same results with Polybor-Chlorate on a one-third acre lot with such problem weeds would have required at least 300 lbs. of herbicide in 300 gal. of water. This would have also required additional tank agitation.

Yeager Construction Co. of Riverside applied a 2¾-in. asphalt layer and compacted it to 2½-in. Since the herbicide is applied shortly before the asphalt, there is little chance of Pramitol leaching away from the area of application.

Pramitol is a triazine herbicide which is held tightly by soil particles. As weed seeds germinate the chemical is absorbed by plant roots, interfering with the growth process and killing the weeds before they develop sufficient size and strength to penetrate the asphalt.

The spray was applied in early morning while the air was still. The tank pressure was low — about 40 psi. — and the resulting coarse spray presented little problem of wind-carried drift. Herbicides should only be applied on days of little or no wind to avoid spray drift to non-target areas.

Application of Pramitol 25E can also be combined with standard and special cutback asphalts if mix temperatures do not exceed 170°F. Combining the operations can save time, labor and equipment costs.

The Widening Potential Of Tree Injection

By DEL KENNEDY
President, CLM National
San Jose, California

TREE INJECTION can be a valuable asset to the commercial arborist. It offers an almost complete pollution free method of chemically treating trees. And it can be done with less labor than normal spray operations. Further, timing of treatment is not influenced by weather conditions, as is true with spraying.

My interest in this system began a few years ago when I first tried the system. Having been involved in the tree surgery field more than 20 years, I was enthused to the point of helping form a new company based on this method. This was the beginning of CLM National. I sold my very successful tree service company in northern California and became part owner in this new corporation, which began operating in January. Headquarters are at San Jose, Calif.

CLM operates as factory distributors for the J. J. Mauget Co., makers of tree injection products. We are presently setting up dealers to use these products across the US and Canada, using the Mauget tree injection system. We will not sell to the homeowner. We want only professional tree people to use our products.

My first experience with this Mauget tree injection system was some three years ago. I started using it immediately in my own business. At the time I was a bit skeptical as is most everyone when first using a new product. But after using it on a few problem trees I was convinced beyond doubt at the positive results. I was able to get trees to respond where other methods failed, thus my enthusiasm for the system.

It also increased the earnings of my tree business.

I have been a member of the National Arborist Association for some years and when I was asked to speak at the 1970 annual meeting at Phoenix, Ariz., on DDT substitutes, I agreed at once. At this time I was not associated with the J. J. Mauget people, other than by using their products in my own business. I felt that with the problems tree companies were experiencing with state bans on chemicals plus the public emphasis on pollution, that tree injection had to be reckoned with. I was glad to pass this information on my experience to my many friends, who were also feeling the squeeze on their spray business. It is their livelihood.

Some N.A.A. members then began using the injection system with very good results. Others did not, because the system was new to them.

In light of this, let's consider some problems of the spray business. First, how many times has a crew been dispatched to the job and failed to complete the work because of high winds or because of rain? Further, most businessmen in this industry have had customers demand repeat treatments "because it began to rain, shortly after your crew sprayed the trees." Adroit salesmen, as most custom applicators are, can usually convince customers that the stickers and spreaders used in the chemical have kept the rain from washing the material off, and that it will still do the job. Customers may accept this, for the time being, but if they subsequently see so much as one insect on their trees, they will be right back on the phone demanding another spray application. They may be a regular customer, or a new one. Regardless, the man in business cannot afford to

Editor's Note: Mr. Kennedy, author of the accompanying article on tree injection is president of CLM National. A veteran tree care operator, he has been working with the J. J. Mauget Company in developing tree injection as a practical means of treating trees. A new area being researched is the use of DuPont's Benlate, a benomyl fungicide, to treat trees infected with Dutch elm disease via the Mauget injector system. Mauget has developed a carrier for chemicals which apparently speeds circulation of chemical through the tree system, basis of the CLM Company's market approach, for the entire Mauget product line.

Use of benomyl via this method is in the test stage. It is not as yet labeled. However, the use of benomyl for treatment of trees infected with DED is being researched by scientists in both this country and elsewhere. Problem appears to be to get trees to absorb the chemical in sufficient amounts to be effective against the disease. Newspaper articles, though vague regarding details, have listed costs as high as $400 per treated tree where soil was dug up around the tree and benomyl placed in the ground (Cleveland Press, Aug. 5, 1971).

A Canadian researcher, Dr. Edward S. Kondo, has used benomyl by cutting major roots and then pumping the chemical under pressure into the tree. Damage to roots admittedly places a severe strain on the tree. He is now testing the Mauget injection system.

Because of the apparent effectiveness of Benlate as a treatment, the Mauget system does hold promise for the future. Early reports, though unofficial, indicate that the injection system has been able to circulate sufficient benomyl into the tree system.

In brief, the article by Kennedy is his own testimonial for the tree injection system and one hope of the industry for an effective method of using a fungicide to treat trees infected with Dutch elm disease.

—A. E.

lose them. Even so, when you have to repeat a job, you usually have lost your profit.

There are other hazards in spraying. These include spray drift on cars, windows, lawn furniture, etc. The list is almost endless. If I were asked to name the greatest hazard, it would be the expense of paying men while they wait in the shop for wind or rain to cease. Secondly, I would name pollution and contamination of the environment. Remember, it is the responsibility of each of us to try to provide a safe place for our children and grandchildren to live and to lead normal lives.

Tree injection offers an alternative system. Application of plant foods and pesticides directly into the sap flow of trees has been of interest for several hundred years. Like some basic medical practices, it was initiated by Leonardo da Vinci! Until recently, however, systemic materials and the methods for injecting them were limited.

Some supposedly professional tree companies are still using the crude method of drilling into the cambium layer and putting chemicals in the hole, which is then plugged, usually with putty. I only wish they could see some of the beautiful trees on the grounds of the California capital at Sacramento which suffered severe damage by this type of work. Rotten spots and slime flux which oozes down tree trunks are common. Such results are tragic for the industry and not to be condoned.

The Mauget Tree Injector, which is patented in both the US and abroad, is one method by which tree injection can be accomplished, without undue damage to the tree. The principle of the device is much like that of the medical hypodermic needle in that the fluid is introduced internally. There is a minimum of damage to the intervening tissue. Healing is as rapid as the condition of the tree will allow.

CLM's most widely used product, Inject-A-Cide is a special, concentrated grade of organic phosphate, systemic insecticide. It is called Meta-Systox-R and is produced by Chemagro Corporation under license by Farbenfabriken Bayer, A.G. of West Germany.

This new system of shade tree care is a breakthrough in effective control of insect pests that damage trees. It utilizes a completely closed system which implants the chemical directly into the sap stream, and eliminates the hazards of drift in spraying.

The injector unit is made of two interlocking plastic cups containing the premeasured quantity of Inject-A-Cide. A small length of metal tubing called a feeder tube is used to connect the injector unit to the tree trunk. The feeder tube is embedded in the trunk by means of an inserting tool. Feeder tubes are driven into the tree every six inches around the trunk at approximately breast height.

Once feeder tubes have been installed, the operator then squeezes the units of chemical together causing them to be pressurized. Once the operator places the units of chemical on the feeder tubes and ruptures the seal, chemical is blown into the sap stream under pressure. It then flows by systemic action into the tree, up through the branches and leaves, where it is toxic only to those insects feeding on the tree. It does not offer a hazard to birds, wildlife, humans, or such beneficial insects as bees. It takes only a short time for the units to empty. They can then be removed and the feeder tubes pulled out with a pair of pliers. Injecting can be done in any weather. High winds, heavy rain, or even darkness fail to foil the operation.

Feeding trees is another use for tree injection, using the same injecting methods. In reality, the system is used to introduce a balanced plant food into the system of the tree. This treatment is particularly useful for problem trees with advanced stages of chlorosis where other methods have failed. One reason for this is that it is possible to bypass the roots. Thus, vigor is quickly restored to nutritionally starved trees.

Fertilizers used for injection must be a certain type and strength, compatible with the tree. After many years of actual field testing, the Mauget people have developed a liquid nutrient called Stemix. Stemix contains dilute quantities of nitrogen, phosphorous, potassium, zinc, iron, manganese and copper, fortified with vitamins and hormones.

Stemix will show noticeable results quickly, usually within one to two weeks. Once improvement is observed, the recommendation is that normal applications of fertilizers be made via the soil.

We have other chemicals that are being field tested. These include chemicals for gypsy moth and the dreaded Dutch elm disease. I am confident more data on these will shortly be available. These new data may provide the big breakthrough for control of both.

Annual Meeting Report
International Pesticide Applicators Association

National Attendance at Seattle Applicator Conference

By LEW SEFTON, secretary-treasurer

The annual conference of the International Pesticide Applicators Association was held in Seattle, Wash., Sept. 16-18. The merit of its recent name change from "Pacific Northwest Pesticide Applicators" to "International" was upheld by attendance from New York, Washington D.C., Utah, California, and British Columbia. These applicators are enthusiastic over the possibility of joining the charter members, Washington and Oregon, in establishing a truly representative "International." This affiliation should greatly enhance the sprayman's cause.

The word, "C-A-U-S-E," introduces the theme of this year's meeting: Controlling And Using a Safe Environment. For possibly the first time since "Silent Spring," a group of scientists, with facts, were assembled, at one place at one time, to bring proof of the pesticide fallacies that have been foisted on the public with an approach based on hysteria and its resultant sensationalism. It is the Associations intent that taped speeches will be edited, approved by the speakers, and made available on request.

Examples of excellence through their **factual** research were such speakers as Dr. William Hazeltine, Butte County California Mosquito Abatement District; Dr. Gordon Edwards, Entomologist—San Jose State University; Dr. Griffith Quinby, Consulting Toxicologist—Wenatchee, Washington—a nationally recognized authority on DDT and PCB's. Collectively, and with indisputable **data,** these experts (1) destroyed bird depopulation findings; (2) debunked residues located in Oceans including the Pacific, Arctic, Antarctic, and such; (3) showed conclusively that substitutes were more dangerous and less effective than chlorinated hydrocarbons; (4) illussrated the need to return to pesticides with proven safety to man rather than use more-toxic-to-man chemicals; and (5) even gave proof of the benefits of DDT in man's health and in the increase of habitat for wildlife.

This meeting was not confined to only those people who would say what the sprayman wanted to hear. Represented were eminent environmentalists, ecologists, and marine biologists. Most were cooperative, some appeared confused. It was notable that those appearing confused were unable to substantiate their findings as having been validated by research updated since the use of mass spectrometry to identify between DDT and PCB's.

This program was arranged by the Washington Chapter. Oregon will be next year's sponsor. One helpful aspect for next year is that these same fact finding scientists will have updated information, and that hopefully their search for truth will bring more, like them, out of the bullrushes. It is the hope of the Association that, by 1973, these annual meetings can be hosted by new chapters in others states. Formation has started in California and British Columbia.

Charles Seibold, Portland, Ore., was elected association president for the coming year. Don Mock, Seattle, Wash., is the new vice-president. Election of these two leaders insures continued advancement of the organization. Past president Lew Sefton, Lake Oswego, Ore., was elected secretary-treasurer.

Anyone, spray applicator or associate industry, wishing to join this cause, may do so as a chapter or as an individual. For information about joining the International Pesticide Applicators Association, please contact the secretary-treasurer, as follows: L. F. (Lew)) Sefton, 5600 S. W. Rosewood, Lake Oswego, Oregon 97034. Telephone: (503) 636-6443.

Unique feature of the curriculum at Catawba Valley Technical Institute at Hickory is summer employment in a commercial recreational facility. At Rock Barn Club of Golf, Conover, N.C., are, left to right: Ray W. Avery, Lincolnton; Guy E. Hollar, Jr., and Rock Barn Superintendent Guy Hollar, Sr., of Conover; and Kenneth L. Evans, Claremont.

Commercial Turfgrass School Opens at Hickory, North Carolina

A new 2-year course for commercial turfgrass care is being developed at the Catawba Valley Technical Institute, Hickory, N. C.

Aimed primarily at training men for golf course technicians leading to golf superintendent, the course also prepares young men for positions such as park and cemetery supervisors, highway beautification planners and supervisors, landscaping contractors, public grounds and athletic field supervisors, and sod producers. Formal name of the curriculum is Recreational Grounds Management.

Courses lead to an associate in applied science degree and includes subjects such as soil science, plant science, drafting and surveying, landscaping design, and agricultural chemistry. A summer work program at some type recreational grounds facility — most likely a golf course — is also a part of the program.

The first students for the course began classwork in late September when the Catawba Valley school opened. This institute is one of North Carolina's community college system schools which offer career training based on practical experience and classroom instruction.

The first summer, students were employed by Rock Barn Club of Golf, Conover, N. C., and at Grandfather Mountain Golf Club, Boone, N. C.

California Weed Book Increased In Size

A looseleaf handbook, the University of California Growers Weed Identification Handbook, has been increased in size by 12 pages. It is now a 79-page full-color publication which shows weeds as both seedlings and when mature, and it also contains detailed descriptions of each weed.

It is available at a cost of $15 from the Public Service Office, U of C, 2200 University Ave., Berkeley 94720.

For those already holding copies, the 12 new pages may be ordered alone for $2.

Tennessee Short Course Planned For Turfgrass

A one-week winter short course in turfgrass management has been announced by the University of Tennessee, Nashville. Dates are Jan. 24-28, 1972.

Purpose is to provide intensive instruction in the fundamentals and applied aspects under the direction of seven Universtiy professors who will serve as instructors.

Subject matter areas include soil relationships for growing turf, soil fertility and acidity, selecting grass species and varieties, seedbed preparation and planting, fertilization, irrigation, mowing, identification for weeds, insects and diseases plus controls, special maintenance practices for golf courses and other commercial turfgrass areas and tree and shrub planting and care.

Details on the course are available from Dr. Lloyd M. Callahan, Department of Agronomy, Plant Sciences Bldg., Knoxville, Tenn. 37916. (Tel. 615/974-7161. Cost is $25 for primary registrants and $15 for each assistant accompanying the primary registrant.

SOD INDUSTRY SECTION

Canadian Sod Giant

Fairlawn is a Study in Management and Marketing

A major force in the Canadian sod industry is Bill Campbell, a grower at Brantford, Ontario. He has worked closely with the Canadian growers association as an officer and director through the years and is currently helping develop a major summer meeting for next year when the group hosts the American Sod Producers Association.

Campbell's company, Fairlawn Sod Nursery Ltd., is now growing some 1550 acres of cultivated sod. He has 700 acres at Brantford which is the headquarters farm, 650 at Montreal, and 200 near Windsor.

Like most sod production in Canada, his acreage is on mineral soil and turns over about every 30 months. Canadian sod culture, Campbell says, is quite similar to methods used in the northern sections of the U.S.

However, growers apparently have somewhat less in the way of disease problems. Also, they do little irrigation, except just prior to harvest when necessary. Sales are growing and approaching 30 million yards yearly in the Province of Ontario, with another 5 million in other Canadian areas. A few more growers are entering the field each year as popularity of the industry progresses. Campbell estimates that about half his total production goes to residential construction. The balance, he says, goes to all sorts of commercial uses such as schools, factory lawns, parks, and highways.

Problems, according to Campbell, are closely associated with those in the U.S. segment of the industry. Fixed costs are high. Land must be bought and a considerable investment made in establishing the crop, and then getting it to market. Specialized equipment is needed. And production must be tailored to what the market can utilize. Like this country, from time to time, growers experience the problem of some surplus. Land where most of his sod is grown, Campbell says, runs between $300 and $400 per acre.

Campbell originally was a soils extension specialist at the University of Guelph. He formed a partnership with a friend who maintains only a financial interest and went into the sod production business. The first crop by Fairlawn was sold in 1960, was less than 150,000 square yards. By comparison, 1971 sales will approach 2 million square yards.

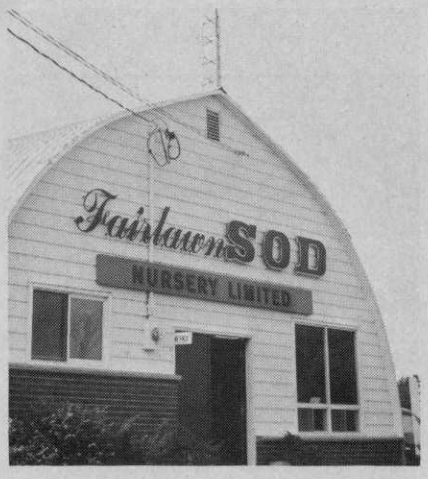
The Fairlawn Sod Nursery operation is an excellent demonstration of management and marketing. Campbell's theory is that many operators can grow acceptable sod, but it takes good management to efficiently harvest the crop, transport it to market, and then compete in the market for sales. He recently returned to school part time and obtained his masters degree in business administration.

His primary turfgrass is a 50-50 blend of Merion Kentucky bluegrass and common. He stresses, however, that the common is a mixture of known Kentucky bluegrass strains, composed of named varieties, grown and blended by Jacklin Seed Company, the source of all his seed. The so-called common may include Delta, Newport and other varieties processed by Jacklin which blend well with Merion. This year Campbell is including some Fylking in his blend.

Campbell credits his management team with much of the growth and financial success at the Fairlawn operations. He believes in long tenure for employees. His general manager, Garry Jefferies, 35, has been with the company 10 years, and currently serves as a director of the Nursery Sod Growers Association of Ontario. General farm manager, Ed Strome, 32, has been with Fairlawn for six years.

Management starts with making the crop. Besides a creditable source of seed, Campbell depends on special equipment, not only to get the job done right, but to cut the labor and

Bill Campbell, left, with his general farm manager, Ed Strome.



Office headquarters

Office manager, Ray Dunham

equipment costs. For example, a J & M bulk fertilizer unit which holds 8 tons is used to eliminate bags. The bulk unit feeds fertilizer into a tractor pulled 1-ton Lely spreader. In short, Campbell says this saves handling 40 bags of 50 pounds each for every ton. He uses about 200 tons of fertilizer yearly at his Brantford farm. Savings are two-fold. First, fertilizer delivered in bulk is $6/ton less in cost than bags. Second, the 1-ton Lely can be filled mechanically in five minutes. It would require about one-half hour to open and dump 50 bags.

On new seedings, Campbell uses a 12-foot Brillion Pulvi-mulcher in soil preparation. He plows once and then pulverizes rather than disking. Disking, he feels, ridges and fluffs the soil too much, thereby increasing packing and levelling operations.

The harvesting system is a pallet operation. Ryan sulky rollers are used to lift and roll sod and pallets are piled by hand. Trucks are then loaded with a forklift.

A typical crew consists of a foreman, a cutter operator, four men to build pallets and a forklift operator. Such a crew can harvest an average of 700 square yards per hour throughout the working day. This includes time lost in moving from field to field and also routine breakdowns.

Campbell keeps daily records of yards harvested and hours worked and credits good foremen for keeping his phase of the operation efficient.

Pay per hour for labor runs $1.90 to $2.00 per hour.

Sod is transported to market on a contract basis, with contracts being made with owner operated units. These carry the Fairlawn emblem. Rates are paid on a per yard basis. This appears the best bet since trucks are needed only 7 months of the year.

Pallet losses are a nusiance and Campbell estimates that he will lose about 700 per year in moving his crop. This represents a $2000 yearly loss.

Fairlawn sod is sold mostly to landscapers with direct retail business accounting for less than three percent of the total. Considerable credit is given but accounts are normally paid in 60 days. Service charges are applied to all past due accounts. Bad debts range from one to two percent of sales in a normal year. They are minimized by credit investigations of new customer and ageing of receivables with prompt follow up on overdue accounts.

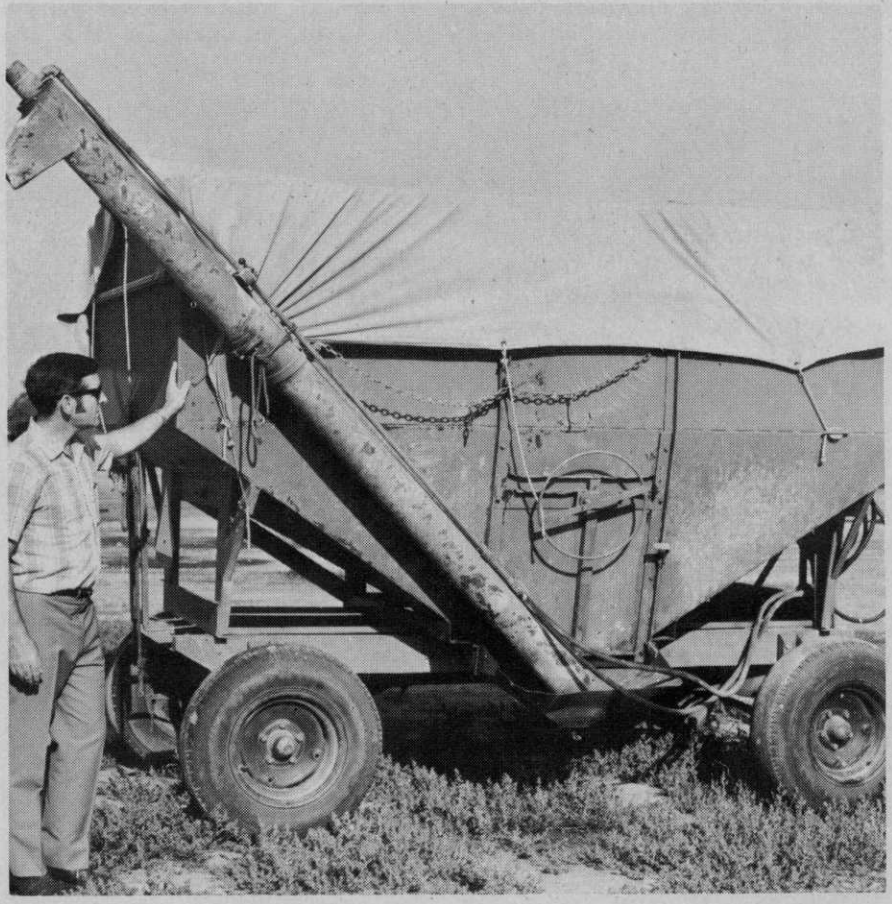
Prices vary, but the normal wholesale farm price has been running 25¢ per yard. A 10 percent volume discount is given on total season's purchases of 50,000 yards or more. Around Toronto, the price has been about 20¢ this year with some sod selling as low as 18¢.

Campbell reports that metropolitan Toronto has to be the sod using capital of the world. New housing includes sodded lawns, both front and back, and the city quite likely has the highest use of sod on a per capita basis in the world, he says. About 65 of Canada's 100 growers today are located within 60 miles of this major market.

The business of growing sod commercially in Canada started in the early 1950s. Campbell says that the late William Ruthven of Alliston, Ontario, noted the large amount of pasture sod being utilized in the Toronto area and planted a field to Merion bluegrass.

This field was mowed, fertilized and sprayed as any fine lawn. Landscapers early noted the superiority of this cultivated product and for a number of years the Ruthven Merion Sod Co. Ltd., found it difficult to meet the demand.

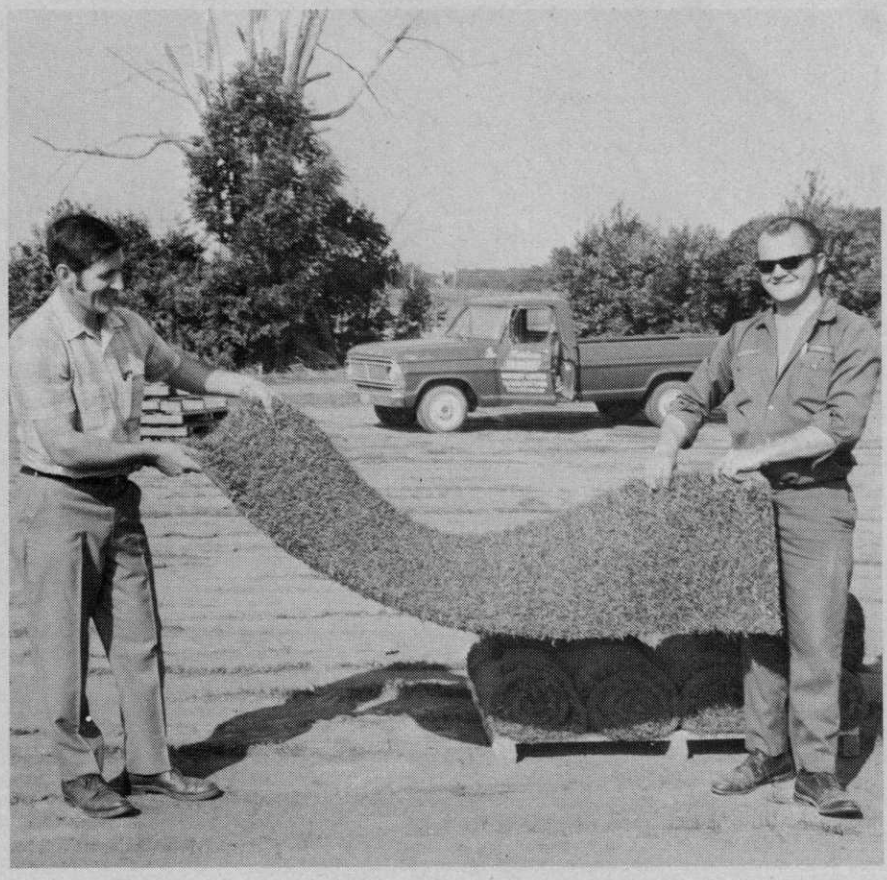
Campbell states that the rapid



Campbell says use of J&M bulk fertilizer unit saves handling 40 bags of 50 pounds each for every ton. The unit holds 8 tons and feeds into a tractor-pulled 1-ton Lely spreader.

growth of the industry in Canada and indeed, North America, during the past 20 years was probably due to (a) the availability of Merion bluegrass which was a superior variety with an extensive root system which lent itself to rapid production of salable sod, (b) the generally availability of the power sod cutter which first came into use in the late 1940s, and (c) the great surge in all types of construction, accompanied by rising incomes and a buoyant economy.

Today, about 80 growers with acreages ranging in size from 10 to 1500 operate in Ontario. They grow upwards of 18,000 acres. Quebec counts 14 growers with 3600 total acres, all within 40 miles of Montreal. They sell in excess of 4 million square yards yearly. Other areas have fewer growers. In Alberta a few are located near Calgary and Edmonton, and in Manitoba there are at least two growers near Winnipeg, Campbell states. In the Maritimes there is one farm near St. John, New Brunswick. Sod production in British Columbia is small because moisture conditions are such that lawns can easily be established from seed in the Vancouver area.



Campbell, left, and Ed Strome.

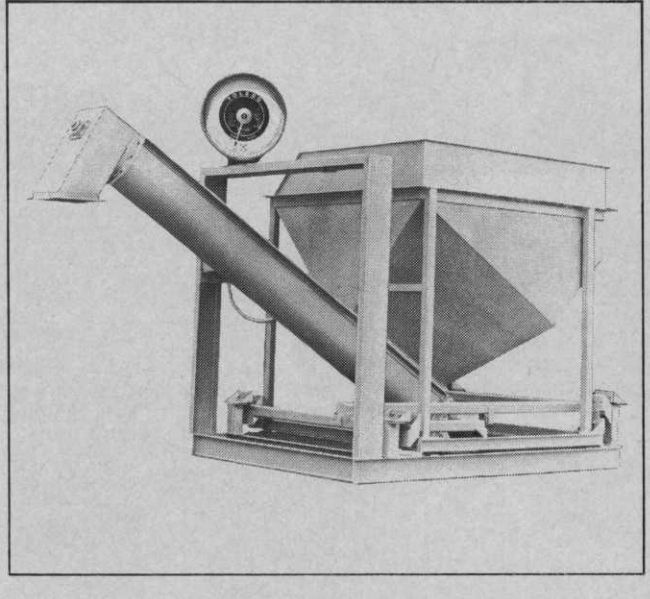
Fairlawn now grows some 1,550 acres of cultivated sod.

"GRASSHOPPER" MOWER: Scott Company, Hutchinson, Kansas

New drive concept for a mower is cart-like design with a front-mounted three-bladed rotary mower assembly. Conical trans-axle drive combined with the mower's compact design is aimed at the commercial turfgrass market. Forty-inch cut combines with steering mechanism maneuverability. Steering mechanism is simply two handles. Minimum turning radius is little more than the 42-inch width of the unit. Mower drive line is jointed so the deck assembly can follow uneven terrain without scalping or becoming high centered. The mower assembly can also be removed easily so the cart can be used as a run-about. For more details, circle (701) on the reply card.

PEST CONTROL OPERATOR SPRAYER: FMC Corporation, John Bean Div., San Jose, Calif.

Self-contained pest control operator sprayer fits into the back of a small pickup truck with ample room remaining for the transportation of a full working supply of spray materials. Provides curbside reach of all functional parts, including tank lid, starting mechanism, hose reel, and controls. Equipped with 50-gallon stainless steel tank. Mechanical agitator in this tank assures positive chemical mixing at all times, while an in-line filter prevents the introduction of foreign material into the spray line. The tank contains a sealed, vented corrosion-free cover. Features a 5 gpm high-pressure John Bean pump with an adjustable regulator for pressures up to 300 psi. Pump is driven by a gasoline-powered engine, and contains simple drive belt adjustments and special belt guards for added operator protection. For more details, circle (708) on the reply card.

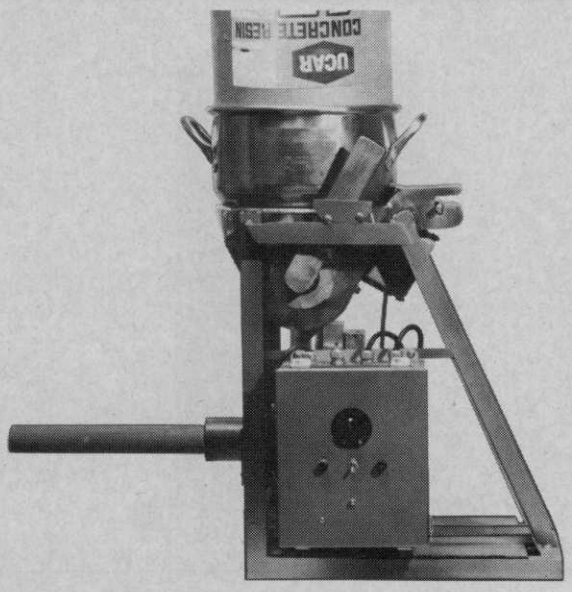


WEIGH HOPPER: Ferguson Industries, Dallas, Texas

Low cost 2-ton weigh hopper is mounted on free Flex-Poise Scale. Hopper is stainless or carbon steel with a removable scalping screen, a 1 ton discharge per minute heavy duty screw conveyor, 5 hp, 3 Phase, TEFC Motor, mounted on the Ferguson Flex-Poise, non-corrosive scale with 5000# Toledo Dial. The utilization of the Ferguson Flex-Poise weighing system provides low maintenance and accurate service. Available in other sizes and with other scale readout systems. For more details, circle (704) on the reply card.

MOUNTED HYDRAULIC CRANE: Ruger Equipment, Inc., Uhrichsville, Ohio

Standard model truck mounted one-ton hydraulic crane features a two-speed hydraulic system, variable effort hand pump and a boom that is 54-inches long. Also available in ¼, ½, two- and three-ton models; and also available as portable floor cranes. Variety of optional accessories are available. For more details, circle (705) on the reply card.



AUTOMATIC POWDER DISPENSER: United Utensils Co., Port Washington, N.Y.

Automatic, dust-sealed powder feeder uses the actual 12-gallon fiber drum as its hopper. The dispenser eliminates the transfer of powder from the drum to another hopper prior to dispensing. In operation, the "nose cone" of the dispenser is removed and placed over the open drum. Then the cone-and-drum are rotated as a unit into delivery position. The nose cone has a tight-fitting closure and a valve (in the closed position) to prevent loss of powder during the pivot operation. Once in position, all operations are automatic. Entire assembly is designed for remote operation. A low-level alarm light or buzzer indicates when the drum is empty. Auxiliary vibrator on the drum-side of the assembly keeps the powder moving. For more details, circle (703) on the reply card.

PORTABLE ELECTROSTATIC PAINT SPRAY SYSTEM: Eclipse Systems, Inc., Fairfield, N.J.

Principal that electrically charged paint is attracted to the item to be coated has been in industrial use for sometime, but has been practically limited to that market. Introduction of portable system makes speed and savings in labor and material attributed to this process available to the maintenance painting field. Complete system is trailer mounted. Consists of a gasoline driven 15 cfm compressor and 110 volt alternator, electrical power supply, 3 gpm paint pump, hand electrostatic spray gun and 25 feet of hose. Successful application of all types of materials including aluminum paint, epoxies and water solubles is claimed by the manufacturer. For more details, circle (706) on the reply card.

ALL-TERRAIN BIKE: Huron Tool & Mfg., Lexington, Mich.

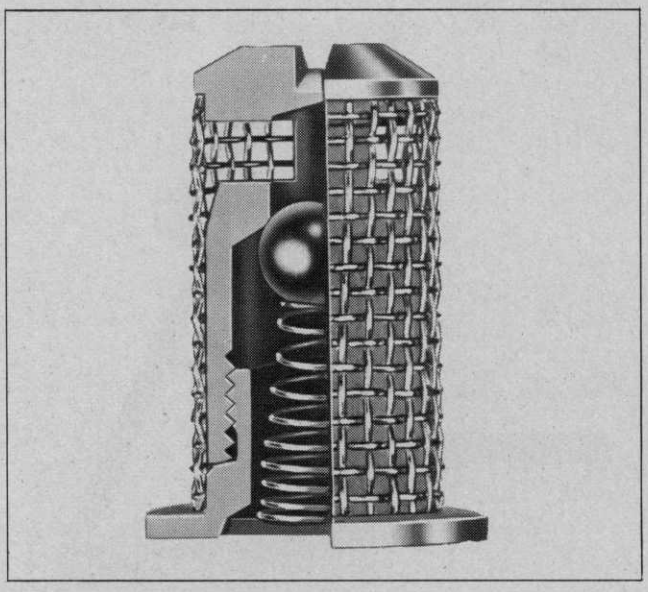
"El-Burro" all-terrain, all-season hike-bike, is designed for up to 32 mph; can carry two. Tank of gas lasts for 4 hours. Rolls through snow, sand, marsh, fields. Powered by a 5 h.p. engine with a powerful TC-88 torque converter for toughest trail conditions. Distributorships and dealerships available in choice territories. For more details, circle (707) on the reply card.

SWEEP LOADER: Wayne Manufacturing Co., Pomona, Calif.

Capability for pinpointing load employs only one lever to automatically maintain proper hopper attitude during the lifting and dump cycle. Powered by 210 hp V-8 engine, the sweep loader features 2-speed power take-off which allows effective sweeping at slow speeds. For heavy sweeping PTO shifts the pickup and gutter brooms to higher speed for one-pass street cleaning. For more details, circle (716) on the reply card.

FLAIL LAWN CONDITIONER: Venture Systems, Inc., Fresno, Calif.

Flail type lawn conditioner combines three important lawn care functions in one machine. Free swinging flails are mounted on a spiral that reduces vibrations because of the even load placed on each flail. Neoprene spacers cause flails to bounce on contact with solid objects such as sprinklers or curbs. Flails are staggered to provide ⅜" incremental cut across the full working width for each revolution of the shaft. Lawn conditioner removes dead grass, renovates old lawn and mulches leaves. Distributorships are available for the multi-purpose flail type lawn conditioner Model 7011-A. For more details, circle (702) on the reply card.

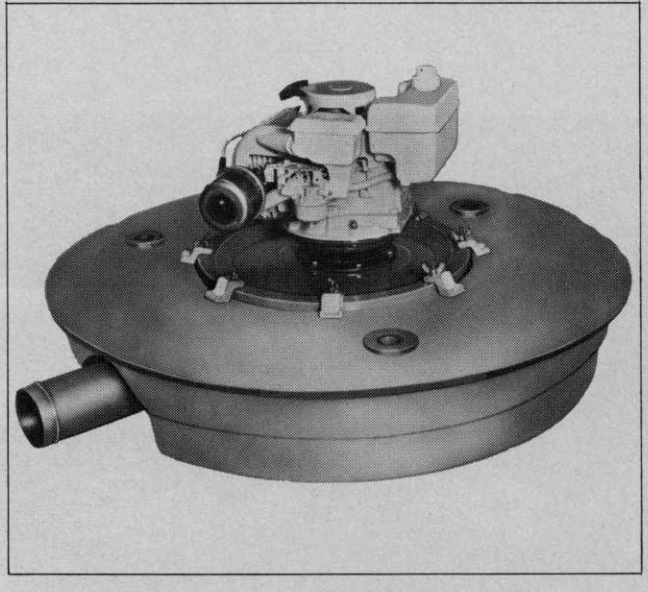


STRAINER CHECK VALVES: Spraying Systems Co., Bellwood, Ill.

Strainer Check Valve for use with TeeJet spray nozzles with tip capacities up to 1.0 gpm. Original design was limited to tips with up to 0.46 gpm capacities. New unit provides the dual function of protecting the tip from clogging as well as preventing dripping from the nozzle after line pressure shut-off. Strainer check valve is offered in choice of brass body and cap with monel metal screen and in body and cap made of aluminum, stainless steel or polypropylene with stainless steel screen. Screens supplied in choice of 24, 50, 100 or 200 mesh sizes. For more details, circle (711) on the reply card.

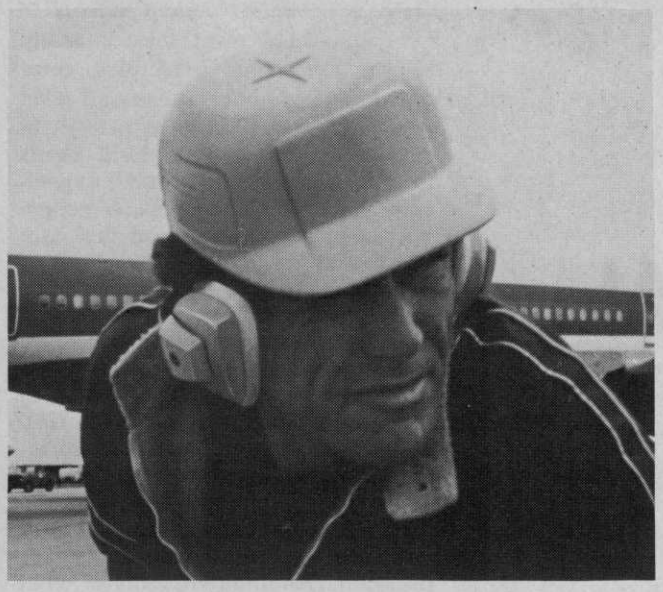
SPRAY RIG: Public Health Equipment & Supply Co., San Antonio, Tex.

Compact spray rig is skid mounted fiberglass tank of size for a pickup, utility cart or tow cart. Ideal for small area weed spraying, liquid fertilizer application or tree spraying. Unit can be made portable at little cost by mounting axle, wheels and a hitch, or is adaptable for a spray boom. For greenskeeping can be hooked up to most golf course haulers or garden tractor rigging. Complete with 50 gallon fiberglass tank, on skid, 4 hp engine, six roller pump, 25 ft. of hose with handgun, all necessary plumbing and regulator. $299.50. For more details, circle (709) on the reply card.



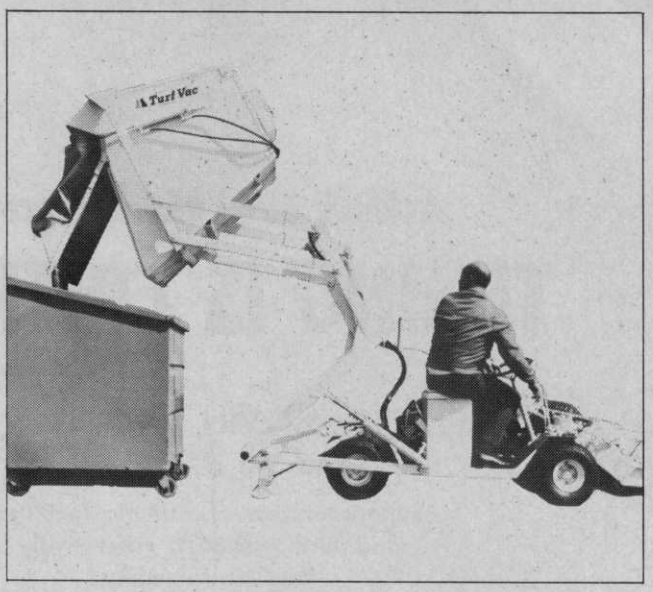
PORTABLE PUMP: Colt Industries Pump Div., Kansas City, Kan.

General purpose portable pump floats on the surface of holding basins, sumps, excavations, lakes and streams. Designed for a wide variety of emergency and constant-use applications. Available in five models of varying sizes and capacities, driven by a choice of gasoline, electric and air motors, and ranging in weight from 40 to 220 lbs. Float ring of polyethylene is filled with 100 percent urethane foam for maximum buoyancy and is resistant to water, sun, hydrocarbons and most chemicals. Adjustable skimming attachments for converting the pumps to fixed-position or self-propelled aerators are available as options. For more details, circle (710) on the reply card.



REINFORCED BUMP CAP: Glendale Optical Co., Woodbury, N.Y.

New series of bump caps, molded from durable, impact-resistant thermoplastic, features decorative star molded into crown to reinforce what is normally the weakest part of a bump cap. Bump cap is designed to stay on the wearer's head under rigorous conditions. Polyethylene nape strap with adjustments on both the right and left sides anchors the cap firmly and comfortably; provides extra gripping power to keep it on securely for full-time protection. Available in variety of colors. Headband is foam padded for comfort and protection; adjustable for all head sizes. Can be used with ear protectors. For more details, circle (712) on the reply card.



TURFGRASS SWEEPER: Turf-Vac Corp., Long Beach, Calif.

Self-propelled turf sweeper — incorporates fast, automatic dumping feature and can be unloaded directly into trash bins, trucks, or over retaining walls. Hydraulic lift system raises the entire hopper, tilts the hopper for maximum dumping efficiency, and opens and closes the hopper door —without the operator leaving the drivers seat. Speeds up to 10 mph. Features include a sweeper-width of 54", front loading (wheels behind scoop), and excellent side-hill stability due to the low profile and four-wheel suspension. All-vacuum pick-up allows it to be used on both turf and paved areas, under both wet and dry conditions. Accessories include a blower unit for curb cleaning and windrowing and a hand-held intake hose for debris removal from hard-to reach areas. For more details, circle (713) on the reply card.

PICK-UP BROOM ATTACHMENT: Waldon, Inc., Fairview, Okla.

Pick-up broom attachment equips Waldon 5000 tractor for all types of cleaning operations on grass or pavement. Broom and hopper attach to the front of the hydraulic boom. Unit is hydraulically operated off the tractor system. Operator can raise the boom and empty the hopper contents into a truck. Polypropylene brush sweeps 60" swath, while front-mounted, spring-loaded hydraulic gutter brush sweeps curb areas or close to walls. Gutter brush can be raised up out of the way when not needed. Unit has self-aligning bearings, heavy-duty welded steel construction and features safety shielded chain and sprocket brush drives with easily accessible lubrication points. For more details, circle (714) on the reply card.

SUB-COMPACT LOADER: Clark Equipment Co., Gwinner, N. Dakota

Smallest loader on market is new Melroe Bobcat, 35 inches wide (inverting the standard wheel gives it a 41 inch width), 60½ inches long and 71 inches high to top of guard. Loader is powered by a 14 hp single cylinder air-cooled engine, with a load rating of 500 pounds. Features single unit transmission frame, welded steel axle housings and non-pressure lubricated clutches. Standard equipment includes 5.00-12-4 ply tires, overhead guard, 2 section hydraulics and Bob-Tach. Buckets available in 36 inch, 42 inch, and 48 inch size. Unit weighs 1400 pounds, not including bucket. For more details, circle (715) on the reply card.

Athletic Field Maintenance—

TIMING IS CRITICAL

By MELVIN J. ROBEY
and W. H. DANIEL

Superintendent of athletic facilities
and turf specialist, respectively
Purdue University
Lafayette, Indiana

AN ATHLETIC MAINTENANCE PROGRAM must include many known agronomic principles, combined with common sense and good judgement. The person placed in charge of the athletic field needs to be trained and have some experience in turf management. A person with a little knowledge of turf care is able to do a good job if he is interested in the field's condition and has the ability to grasp new ideas. He can obtain the necessary information from various organizations such as the State Experiment Stations; Extension Offices; Golf Course Superintendent's Association; Turf Suppliers and private consulting firms. Text books and turf magazines also are of value as guides in athletic field maintenance programs. An understanding of what needs to be done and the principles involved will enhance any program; timing of the procedure is critical.

Below is a list of the maintenance work which should be accomplished each year on bluegrass football fields. If a minimum amount of manpower and money is available, do the work during the periods

TELL ME MORE

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marked with an asterisk. Timing of many of the procedures is very important. Putting something off for a week may mean the problems created will be very expensive and time-consuming to correct.

FERTILIZATION—Two to four applications per year is best. Apply four to six pounds actual nitrogen per 1000 sq. ft. per year.

*March 15 to April 15
May 15 to June 15

*August 1 to August 15
October 1 to October 30

WATERING—The weather will dictate when to water the fields.

May 1 to October 15

MOWING—The weather, watering schedule, and fertilizer application influence the mowing schedule.

April 1 to November 15

AERIFICATION—Important if severe soil compaction is to be prevented.

April 1 to April 30

*June 15 to July 15

November 15 to December 15

OVERSEEDING—This is a good way to establish new grass on the fields each year. Should be done before every home game.

March 1 to April 15

*August 15 to November 15

KILLING WEEDS—Application of herbicides at two different times gives adequate control of most weeds.

*April 15 to June 15

September 1 to October 15

PREVENTING CRABGRASS—Chemicals must be applied before crabgrass seed germinates. Exact date depends on locale.

April 1 to April 30

CONTROLLING GRUBS—Apply insecticide only when the grubs, or their damage, is evident.

March 15 to April 15

PREVENTING DISEASES—Observe fields closely during dates listed. Apply fungicides as required. Consider using long lasting systemics.

March 15 to April 15

*May 15 to June 15

*August 1 to September 30

November 15 to December 15

CONTROL FLYING INSECTS—Only done when insects become a problem during practice sessions and games.

August 15 to November 15

ROLLING—Roll the fields only when the soil is at the best moisture content.

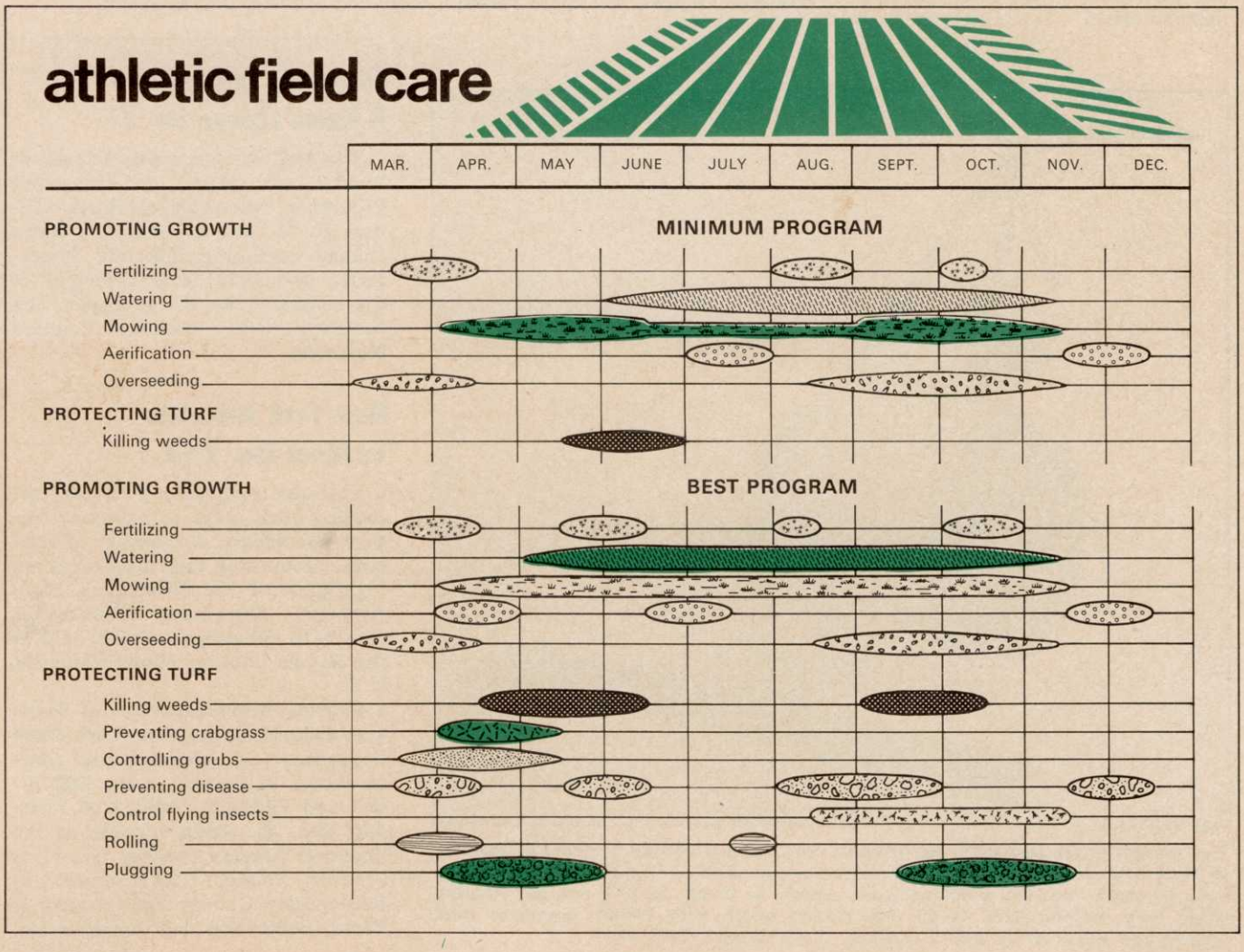
*March 15 to April 15

July 15 to July 30

PLUGGING—A sure way to establish grass in small, bare areas.

*April 1 to May 30

September 15 to November 15



Air Pollution Effect Researched On Grasses

New research on how air pollution affects turfgrasses is underway at the University of Guelph, Ontario, Canada.

Professor J. L. Eggens, in charge of the studies, reports that, to date, that the older the grass, the more susceptible it is to pollution damage.

Dr. Eggens reports that early tests indicate perennial ryegrass is quite susceptible to air pollution. A single ozone treatment caused this grass to develop a more narrow and shorter leaf. Creeping red fescue seems the most resistant variety studied, he reports. This, he continues, is probably because it is a highly compressed, almost drought-resistant grass. It prevents water from escaping easily and allows little room for foreign particles to get in.

Other grasses in the test are Kentucky bluegrass and creeping bent grass.

All are being subjected to relatively high concentrations of ozone, a harmless gas at low concentrations but an irritating polutant in the high concentrations common in urban, industrial areas.

Precision Chipper Corporation officials meet with Alabama Governor George C. Wallace, seated, and other dignitaries to announce Precision Chipper's plans to construct a half-million-dollar headquarters plant in Leeds, Alabama. The firm, which will move its entire operation to Leeds when construction is finished, manufactures equipment and machinery for the sawmill and papermill industry, and is manufacturer of a Tree Harvester unit. Meeting with Governor Wallace, left to right, are: Jack Courson, mayor of Leeds; Robert C. Barnett, attorney; Bob Smith, vice president of Precision Chipper; Fred Denton, state director of industrial development; R. C. "Red" Bamber, Alabama Development Office Director; Harold West, president of Precision Chipper; Mrs. Eddie Mae McDanal, secretary-treasurer of Precision Chipper, and Chase Thoman, consulting engineer and contractor.

Two models of the Jari sickle bar mower, now being produced by the Jari Division of Year-A-Round Cab Co., Mankato, Minn., are available — the 3 hp Chief and the 4 hp Monarch. Mowers, built for grass, weeds, or brush, feature non-sag floating sickle bars ranging from 16-60 inch cutting width with 16-inch single or dual wheels and V-belt drive with 2 clutches. Circle Reader Card #722.

Congdon's Announces A Name Change for '71

The well known nursery business known for years as Congdon's Wholesale Nurseries at North Collins, N. Y., has announced a name change beginning this fall. Henceforth, according to a principal of the company, Robert S. Taylor, the company will become Concord Nurseries.

New York Arborists To Meet Jan. 9-12

Business operation subjects, including such areas as salesmanship, fleet operations, purchasing of supplies, accounting and insurance, are highlights of the New York State Arborists Association Convention, Jan. 9-12. Meetings will be held at the Nevele Country Club, Ellenville, N.Y.

Charles Fromer, director of Pesticide Control of the New York State Department of Environmental Conservation, will speak on the 1972 Insect and Pesticide Outlook on Monday, Jan. 10. Guest speaker at the banquet, Tuesday evening Jan. 11, is Charles Pound, Commissioner of Westchester County Department of Parks, Recreation and Conservation.

meeting dates

Kentucky Plant Food Council, Annual Meeting, The Executive Inn, Louisville, Ky., Nov. 10-11.

National Institute on Park and Grounds Maintenance, Park Maintenance, Sheraton-Schroeder Hotel, Milwaukee, Wis., Nov. 15-18.

Colorado Crop Protection Institute, Colorado State University, Ft. Collins, Nov. 17-18.

Arizona Parks and Recreation Conference, annual meeting, Holiday Inn, Tempe, Ariz., Nov. 17-19.

Metropolitan Shade Tree Conference, 300 N. Park Drive, Arlington, Va., Nov. 18.

New England Chapter, International Shade Tree Conference, Annual, King's Grant Inn, Danvers Beverly Line, Mass., Dec. 1-2.

Minnesota Turfgrass Conference, Normandy Hotel, Minneapolis, Minn., Dec. 1-2.

National Agricultural Aviation Association, Fifth Annual Conference, Fairmont Hotel, Dallas, Tex. Dec. 5-9.

Texas Turfgrass Conference, Texas A&M University, College Station, Tex., Dec. 6-7.

North Central Weed Control Conference, 26th Meeting, Muelebach Hotel, Kansas City, Mo., Dec. 7-9.

Ohio Turfgrass Conference and Show, Sheraton Cleveland Hotel, Dec. 7, 8, 9.

Northeastern Weed Science Society, 1972 Convention, Hotel Commodore, New York, N. Y. Jan. 5-7.

Georgia Golf Course Superintendents Association, Annual Meeting, Augusta Golf Clubs and Holiday Inn, Augusta, Ga., Jan. 9-11.

Western Association of Nurserymen, 82nd Annual Meeting, Plaza Inn, Kansas City, Mo., Jan. 9-11.

Mid-Atlantic Golf Course Superintendents, Annual Conference, Holiday Inn Downtown, Baltimore, Md., Jan. 10-11.

New Hampshire Turf Seminar, University of New Hampshire, Durham, Jan. 13-14.

Southern Weed Science Society, Annual Meeting, Statler Hilton Hotel, Dallas, Tex., Jan. 18-20.

Ohio Chapter of the International Shade Tree Conference and the Ohio State University short course for arborists, turf managers, landscape contractors, garden center operators, nursery men, and others, at the Sheraton-Columbus Hotel, Columbus, Ohio. Jan. 23-27, 1972.

International Turfgrass Conference and Show, 43rd Annual, Golf Course Superintendents Association of America, Convention and Exhibit Center, Cincinnati, Ohio, Feb. 13-18.

BOOK REVIEW

PLANNING FOR AN IRRIGATION SYSTEM by the American Association for Vocational Instructional Materials, a non-profit organization whose objective is to develop such materials in the area of engineering technology. A 100-page manual; color illustrations. Price, $6.50. Published June 1971.

Text helps determine the merits of installing a system if a new one is planned, or to determine if an existing installation is the one best fitted to needs.

Information is provided for considerations in selecting an irrigation system. Aids suggested can be adapted to any part of the country. Procedures for estimating system costs and returns are included.

Non-technical approaches to various problems such as need for water, time and amount needed, and quality of water being used are a part of text.

Manual also deals with the various methods of applying water and the types of systems available. Merits of each are examined from standpoint of installation site, soil, etc. Portable, permanent and automatic systems plus automatic controls are covered.

Technical Competence

Though the association credit states that the book is published in cooperation with the Soil Conservation Service, more than three full pages of acknowledgments and credits are listed in the back of the manual. These include many university staff members plus practically every company which manufactures either complete systems or components.

Availability

For copies, write the association direct at its Georgia headquarters (Amer. Assn. for Vocational Instructional Materials, Engineering Center, Athens, Ga. 30601, or Tel. 404/542-2586). A catalog is also available for some 20 additional instructional manuals plus filmstrips, slides, and other visuals.

insect report

TURF INSECTS

FALL ARMYWORM

(Spodoptera frugiperda)

ALABAMA: Larvae damaged Coastal Bermudagrass in Geneva County field.

CHINCH BUG

(Blissus leucopterus leucopterus)

SOUTH CAROLINA: Heavy and some lawn damage in Clemson area, Pickens County. MAINE: Reports of lawn injury continue; invading homes in southern and central areas.

A TREEHOPPER

(Gargara genitsae)

OREGON: Collected adults on Scotch broom *(Cytisus scoparius)* on July 27, 1970 near Corvallis, Benton County. This is a new state record. Recorded from Washington, Connecticut, New Jersey, Italy, Spain, Austria, Germany, France, and England.

INSECTS OF ORNAMENTALS

AZALEA CATERPILLAR

(Datana major)

VIRGINIA: Larvae damaging azaleas at a home in Gloucester County.

AN ARMORED SCALE

(Phenacaspis cockerelli)

SOUTH CAROLINA: Reported from Horry County on magnolia. This is a new county record.

TREE INSECTS

VARIABLE OAKLEAF CATERPILLAR

(Heterocampa manteo)

MISSOURI: Heavy moth flights at lights in Boone County.

OAK LEAF TIER

(Croesia semipurpurana)

PENNSYLVANIA: Heavy to complete defoliation observed in 1,000 acre area of Cumberland County (second year infestation); light to moderate defoliation (under 60 percent) observed in 700 acre area and heavy to complete defoliation in 6,300 acre area in Union County with increasing trend.

A NOTODONTID MOTH

(Symmerista canicosta)

MICHIGAN: Defoliation noticeable in Wolf Lake Area, Lake County and in East Lake, Manistee County. In Muskegon and White Cloud areas, Newaygo County defoliation just started. Complete defoliation expected at all of these sites.

WALKINGSTICK

(Diapheromera fermorata)

OKLAHOMA: All stages caused heavy defoliation of oaks (mainly black) in scattered areas of southern Le Flore County. Largest area (3 or 4 square miles) 5 miles south of Big Cedar, but 4 other smaller areas found on State Highway 1 between U.S. 271 and U.S. 259. Defoliation up to 100 percent.

AN EURYTOMID WASP

(Eudecatoma marylandica)

PENNSYLVANIA: Sixteen adults emerged from gouty oak gall caused by *Callirhytis punctata* (a cynipid wasp) collected in January from oak (laboratory rearing) near Auburn, schuykill County. This is a new state record.

A CONIFER SAWFLY

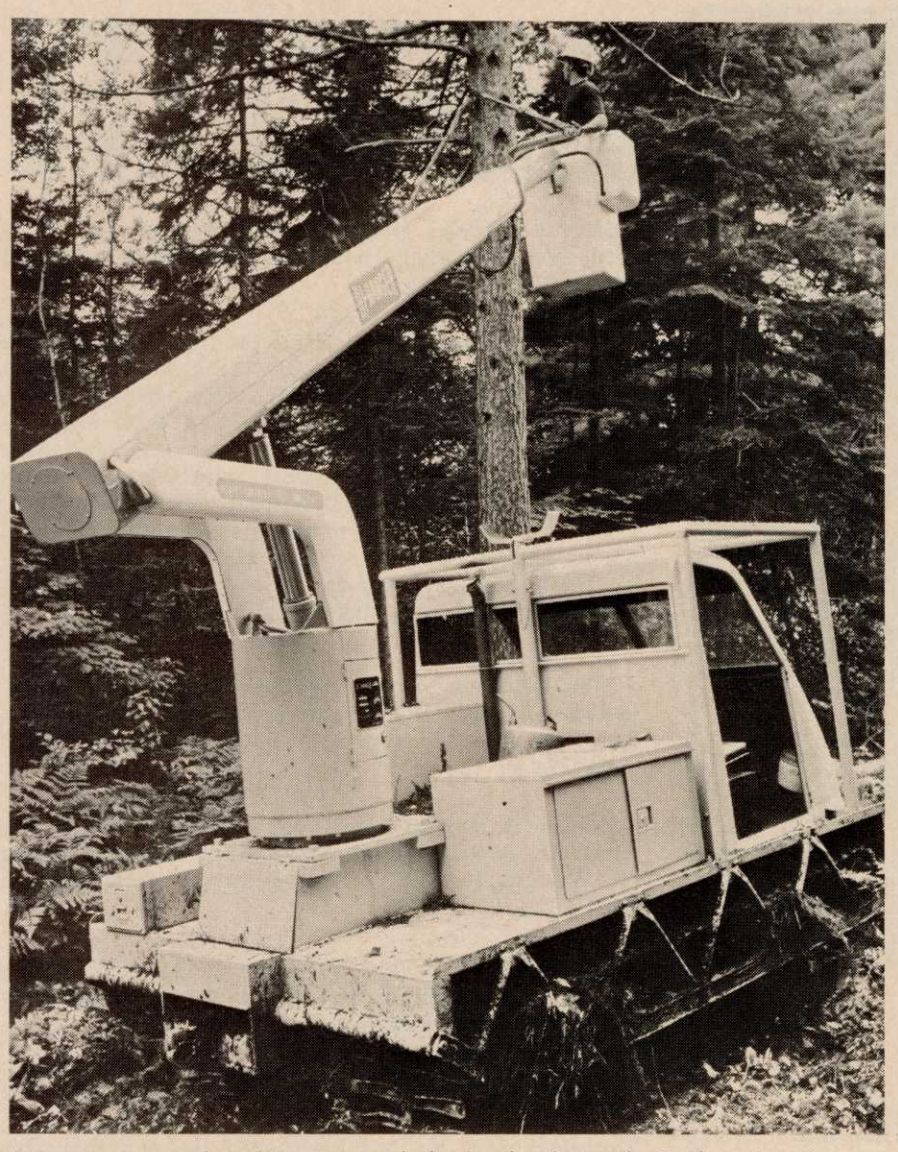
(Neodiprion sp.*)*

OKLAHOMA: Second-generation pupation nearly complete in area; caused heavy defoliation to shortleaf pine in some areas. Latimer County, including Robbers Cave State Park, again had heavy widesperad infestations. Smaller spots reported in southern Latimer County, Snow, Albion, and Antlers areas of Pushmataha County, Daisy area of Atoka County, and Halleyville and Hartshorne area of Pittsburg County. Many spots larger and more heavily damaged by this generation than by first.

MIMOSA WEBWORM

(Homadaula anisocentra)

OKLAHOMA: Light to heavy on mimosa in Antlers, Pushmataha County, for a new county record.



Hi-Ranger mounted on S-Carrier, made by Bombardier, Ltd., Quebec, Canada, performs on side trim operations over rough right-of-way for one of Michigan's Upper Peninsula electrical public utility service companies.

EPA Labels New Material

A herbicide-treated ground cover has received first clearance from the Environmental Protection Agency. The Wood Derivatives Department of Masonite Corporation, Chicago, Ill., has clearance to produce and sell the new product.

Called Fibrex Root Insulator/ Weeder, the new product combines tree bark with the pre-emergence herbicide, dacthal. It is registered for use around established trees, shrubs, ornamental plantings, and flower beds. The company is recommending one 2-cubic-foot bag to cover a 24-square foot area a total of one inch deep. Company tests indicate this depth is sufficient to moderate soil in the plant root zone at a protective level for both summer and winter. (For more details, circle #724 on the reader card in the back of this issue).

Mobile Tower Unit Mounted on Track Vehicle

Mobile Aerial Towers, Inc., Fort Wayne, Ind., has mounted the first Hi-Ranger tower (a 40-foot working range unit) on an off-road track driven vehicle built by Bombardier, Ltd., Quebec, Canada, for use over rough utility rights-of-way in Michigan's upper peninsula.

The unit built in consultation with Heath International, Inc., at Richmond, Mich., a Bombardier distributor, features Mobile Aerial's normal 360 degree continuous rotation and is equipped with automatic hydraulic engine throttle control, plus ground level controls which can override the basket control. The 300-pound rated basket tested out at a minimum tipping load of 450 pounds, and at 900 pounds under structural tests.

industry people on the move

Gary L. Cooper, joins firm of Turf-Seed, Inc., Hubbard, Ore., from seed certification department at Oregon State Univ.

* * *

R. M. Waterman, from Shell product representative at San Ramon, Calif., to senior technical salesman at Orlando, Fla.; **W. R. Hudson, Jr.,** from technical salesman, Overland Park, Kan., to Shell's PCO chemical products at San Ramon; **A. J. Kovats,** from marketing analyst at Atlanta to technical sales post at Shell's Overland Park office; **D. C. Mercer,** from office supervisor at Columbus, Ohio, to senior marketing analyst at Shell's Atlanta office; and **D. L. McKenns,** from manager Shell field sales for health and nutrition, to sales manager of consumer specialties at San Ramon.

* * *

Ellis C. Kent, named regional manager for Kerr-McGee Chemical Corporation's western potash sales, San Francisco, from district sales manager at Portland, Ore.

* * *

Robert D. Doyle, appointed associate manager for American Association of Nurserymen and responsible for Washington, D.C. office operations, from Captain USMC (Ret.).

* * *

J. Peter Pehoski, named director of sales and service for consumer products division of Toro, and formerly national field sales manager of the division.

* * *

Charles K. Koch, promoted to production supervisor of Reinco's Power Mulcher and Hydroseeder Div., Plainfield, N.J. He has been with the company five years and previously was service manager for Chrysler Corporation.

* * *

Rolf G. Engstrom, appointed director of market planning for Turf Products Div. of Toro, from consumer program manager of Atherton Div., Litton Industries.

* * *

Everett M. Myers, named president of F. E. Myers & Bro. Co., a division of McNeil Corp., Ashland, O., from position of v-p. A grandson of the founder, he succeeds Milton G. Moses who retires but continues as a director of McNeil.

* * *

Gerald E. Kimmel, to district sales manager for Toro's Consumer Products Division office at Cleveland Heights, O., from area manager of Kohler.

* * *

D. Michael Bradley, named marketing manager for the Caribbean area of the Agricultural and Veterinary Products Div., Abbott Laboratories, Caracas, Venezuela. He has been with the company since 1957.

* * *

David A. Wheeless, appointed national sales manager for The Leisure Group's lawn and garden product lines, Los Angeles, Calif.

classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: "Position Wanted" 10¢ per word, minimum $3.00. All other classifications 20¢ per word, minimum $4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Boldface rule box: $25.00 per column inch.

HELP WANTED

ESTIMATOR/SALESMAN aggressive self-starter to develop and manage sales and estimating department of a large, aggressive and diversified landscape and park development firm in Philadelphia area. Must have well rounded experience in all phases of landscape estimating and operations. Some general construction experience would be helpful. Salary open. Company car and other fringe benefits. Your reply will be treated confidentially. Our people know of this ad. Send complete resume with salary desired to Box #71, WEEDS TREES and TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

FIELD SALES REPRESENTATIVE—Outstanding opportunity exists for aggressive sales professional with experience in Distributor/Dealer sales of grounds maintenance tractors to market exceptional multi-purpose lawn and garden tractor/mower. Technical knowledge of power equipment helpful. Area covered will be Central United States. Future advancement opportunities with expanding new industrial division of leading specialized farm equipment manufacturer. Send resume to Sam Zuercher, Employment Manager, Hesston Corporation, Hesston, Kansas 67062. An equal opportunity employer.

GOLF COURSE CONSTRUCTION Superintendent: Hiring young man 22-30 years old. Must travel, possess mechanical abilities, able to operate transit, handle men, like the outdoors. Salary good with many benefits. Do not answer unless qualified. Send resume. Reply to The Wadsworth Company, Van Dyke Road, Plainfield, Illinois 60544.

USED EQUIPMENT

RECONDITIONED brush chippers, sprayers, log splitters, stump routers, bucket trucks. Let us know your needs. Equipment Sales Company, 5620 Old Sunrise Highway, Massapequa, New York 11758. Phone 516 799-7619.

FOR SALE: Frinneyfrock sod machine with automatic cut off, also, Nunes Sod Harvester, both like new. Contact Mercer Sod, Inc., Trenton, New Jersey 08619. Phone 609 587-3500.

VERMEER STUMP CHIPPER, model 18, completely reconditioned, $2,800.00; new motor, clutch, chains, sprockets. Phone Auburn, Maine 207 783-3325.

FOR SALE

DOUBLE EDGE sod cutter blades. Will fit any Ryan sod cutter. Works like double edge razor blade. Cuts much more sod per blade. Made to bolt on both ways. $24.00 plus postage. New automatic sod loaders for direct loading to pallets, trucks or trailers. No workers needed on ground. Both products developed and designed by Hadfield. Write or call Glen Hadfield, 4643 Sherwood, Oxford, Michigan 48051. Phone 313 628-2000.

SPRAY AND TREE SERVICE—Illness forces sale of fast growing but stable business. Regular four time per year customer route. Very modern equipment. $34,500.00, terms. Write: George DesBrisay, 333 American Bank Bldg., Portland, Oregon 97201.

POSITIONS WANTED

LANDSCAPE MAINTENANCE SUPERINTENDENT for large scale developments. Have 12 years experience in all phases of landscaping and maintenance, including nursery background. AA degree in Horticulture, 34 years old. West Coast preferred. 21423 South Catskill Ave., Carson, California 90745.

—Advertisers Index—

SEEDS

SOD QUALITY MERION SEED for discriminating growers. Also Fylking, Delta, Park, Newport, Nugget and Pennstar bluegrasses as well as fine fescues. We will custom mix to your specifications. Michigan State Seed Company, Grand Ledge, Michigan 48837.

MISCELLANEOUS

TREE APPRAISALS AND SURVEYS: For names of members of American Society of Consulting Arborists, Inc., nearest you, contact: Executive Director, ASCA, 12 Lakeview Avenue, Milltown, N.J. 08850.

"We don't kill weeds, sir. We remove them scientifically, and so easy, they don't realize they're dead."

Trimmings

ARTIFICIAL TURF use is being questioned by the National Football League Players Association. The association group is apparently getting the run-around from NFL owners following their request that further installation of artificial turf be halted until a study is made. The association wants to determine if artificial turf is causing an "alarming number of football injuries." Owners have referred the players' representatives to the National Football League Player Relations Association in a maneuver rivaling the red tape of a government program. Some 42 percent of regular season NFL games will be played on artificial turf in 11 stadiums this season.

* * *

THATCH buildup in fine turfgrass may soon be eliminated as a troublesome maintenance problem. Michigan State University scientist David P. Martin has injected enzymes and a lignin precursor (ferulic acid) into thatch. The biological material cuts decomposition time by 5 percent—which Martin thinks might just be fast enough to keep thatch from ever building up. Tests continue.

* * *

CONTROLLING WEEDS via science in developing countries has become more important than ever, according to L. J. Matthews, secretary of the New Zealand Weed and Pest Control Society. He said recently that hand weeding is rapidly becoming inefficient and uneconomical, in an announcement of the fourth Asian-Pacific Weed Science Society Conference, scheduled for March 1973 at Rotorua in that country.

* * *

FLORIDA TURFGRASS is big business with specialists estimating dollar value of turfgrass and its agribusiness aspects in excess of $188 million. They estimate 621,000 acres of turfgrasses by 1975, and a state total of 713,000 acres by 1980. Figures are based on population increase projections for the state, with the most single significant increase in acreage to come from golf course construction. Some 19,000 acres of highway rights-of-way will be added by 1975. Cut sod and vegetative propagating material now comprise less than 6 percent of the total turf acreage in the state, but this small portion accounts for $13½ million in sales.

* * *

ACCOUSTICAL EAR MUFFS are called for if operators experience a ringing in their ears for a few hours after getting off a tractor, or if voices of others seem muffled to them. Extension safety specialist Wilbur Stuckey at The Ohio State University says ear plugs and cotton are worthless as a protective device. Ear plugs may cause ear infections and are easily lost. But accoustical ear muffs reduce noise to safe levels, and still permit enough sound to reach the ears for informational and safety purposes.

Consulting Arborists Assn. Founded Four Years Ago

The American Society of Consulting Arborists was founded just four years ago in Philadelphia, Pa., during the annual meeting of the International Shade Tree Conference.

Since that time, an almost exclusive membership of veteran, competent arborists, have offered a new type of service. They serve as technical consultants, appraisers, technical witnesses, and in related capacities to municipalities, developers, architects, tree owners and others.

The group has never solicited members, and by contrast, has been unwilling to accept any but those qualified by training, education, and experience in the industry of arboriculture.

Result has been an increasing demand for services, many of which are in areas where the ASCA does not have membership.

Walter Morrow, a charter member and vice-president, has notified members that the group is seeking capable member prospects in these areas where members cannot conveniently provide service. Normal channels for membership in ASCA is via the association's membership committee. Dr. Spencer Davis, 12 Lakeview Ave., Milltown, N. J., executive secretary of the group for the past two years, handles advertising, public relations, and generally coordinates activities for the group.

According to the recent ASCA

PCB's In the Environment

For the past few years, scientists (working with older and less sophisticated equipment than recently available have often failed to distinguish polychlorinated biphenyls—known as PCB's—from pesticides (particularly DDT) when found as residues in the environment. Government has undertaken a study and the following is a mini-report from 12 scientists who recently gave progress reports on their research with PCB's at a meeting sponsored by the Working group on pesticides, a unit of the President's Cabinet Committee on the Environment. Following is the report:

"PCB's are not pesticides but share some of the same characteristics and can be confused with several pesticides in analytical methods. PCB's are found in many commercial products: Printing inks, carbon paper, rubber tires, plasticizers, and industrial cooling systems (heat exchangers), among others. PCB's seem to enter the environment from many of these sources and become of particular concern when leakages or recycling (of paper) result in contamination of food and water. Harmful properties of PCB's are not yet completely known, but are under intensive toxicological study in a number of laboratories.

"PCB's represent a challenge to chemists far more difficult than the analogy of separating salt and sugar that had been mixed together. PCB's have characteristics that resemble persistent insecticides in some regards, and both groups of compounds may interfere with each other if appropriate precautions are not followed. Chemist R. Webb of the Environmental Protection Agency Laboratory, Athens, Ga., noted that various forms, or isomers, of PCB's can be detected. More than 20 such isomers were detected in liver samples from sea otters, reported chemist J. W. Rote, Stanford University, Pacific Grove, Calif.

"Calvin Corley, U.S. Department of Agriculture chemist at Beltsville, Md., reported that a simple method has been developed to distinguish PCB from toxaphene, which interfered in the analyses and invalidated tests. Natural constituents of eggs that also invalidated tests can be removed wtih a process developed by Dr. Kenneth R. Hill, of USDA's Agricultural Research Service, Beltsville, Md."

newsletter, the states of Washington, Oregon, Minnesota, Iowa, Nebraska, Oklahoma, South Carolina, Tennessee, New Hampshire and Rhode Island need additional consultant coverage.

Correction on Site For Ohio Turf Show

Last month, WEEDS TREES and TURF magazine inadvertently reported the wrong site for the big Ohio Turfgrass Conference and Show which comes up in early December.

Officially, the site is the Sheraton Cleveland Hotel, Cleveland, Ohio. Dates are Dec. 7-9. The Conference this year starts on Tuesday and runs through Thursday.

This show which operates as a state event is actually regional in that attendance is large and visitors come from many states and sections of the country, as well as from Canada. The host committee is planning for 1150 participants, about the same as that of last year.

More than 100 booths have been sold to exhibitors and the educational program is firm. Out of state speakers abound, two new ones this year being Dr. Wayne Scholtes of Iowa State and Dr. D. V. Waddington of Penn State. Dr. Scholtes will discuss basic soil properties and Dr. Waddington's presentation will feature soil amendments. Some 20 additional speakers are scheduled.

Details are available from Dr. Robert W. Miller, executive secretary, 1827 Neil Ave., Columbus, Ohio 43210, (tel. 614/422-2592).

Grounds Managers Elect Officers at Princeton

The Professional Grounds Management Society, successor to the National Association of Gardeners, elected J. Paul Barefoot as president at their recent annual meeting at Princeton, N. J.

Other officers are Allen W. Hartley, Princeton, N. J., vice-president; and Charles L. Hall, Jr., Fairfax, Va., treasurer.

Plans according to the new president are to begin an active membership campaign this fall and a Society program which offers more services to members.

NAAA Conference Set For Dallas Dec. 5

Aerial applicators, 800 strong, plan to meet for their fifth annual conference, Dec. 5-8, at Dallas, Tex. This group, according to National Agricultural Aviation Association Executive Director Farrell Higbee, is a part of some 2200 pesticide and fertilizer applicators in the nation.

Aerial operators, using both fixed-wing aircraft and helicopters, own 6000 aircraft. For both crop and non-crop uses, they normally fly 1.3 million hours yearly.

Higbee reports that the Dallas meeting will be the most informative to date — including accounting procedures and computer programming as well as business diversification, environment, and education as it relates to employee training.

Exhibits will feature the latest application equipment, aids and chemicals. A special program is planned for wives and NAAA members. Full details are available from Higbee at Box 717, Loveland, Colo. 80537, or by telephone (303) 667-5533. Dallas headquarters will be the Fairmont Hotel.

No-drift WILSCO FoamSpray puts herbicides and pesticides in their place.

Wilsco FoamSpray is an improved surfactant additive that reduces drifting in herbicide/pesticide spraying. A little bit (½ gal. per 100 gal. of spray) goes a long way in eliminating pollution.

The same FoamSpray action that puts herbicides or pesticides directly on your crop provides better coverage. Reduces evaporation. Cuts labor and material costs. And visibly indicates sprayed areas.

FoamSpray's active ingredients reduce surface tension on the leaves of tender plants. Without the burning tendency common to many other "surfactant soaps."

It can be used with conventional sprayers capable of 40 to 600 psi pressure. And easy-to-install foam activator attachments are available for all types of spraying.

Wilsco FoamSpray is economical for all applications on crops, along railroad and highway right-of-ways, around tank farms and commercial properties, and in orchards.

For detailed information, return this coupon.

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CITY _____

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TYPE OF APPLICATION _____

Dept. WTN, Wilsco, Inc.
FoamSpray Sales Headquarters
2345 W. Mockingbird Lane
Dallas, Texas 75235
Telephone: (214) 350-2792

Wilsco

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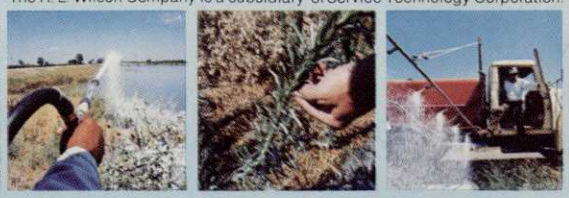

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