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JUNE, 1968



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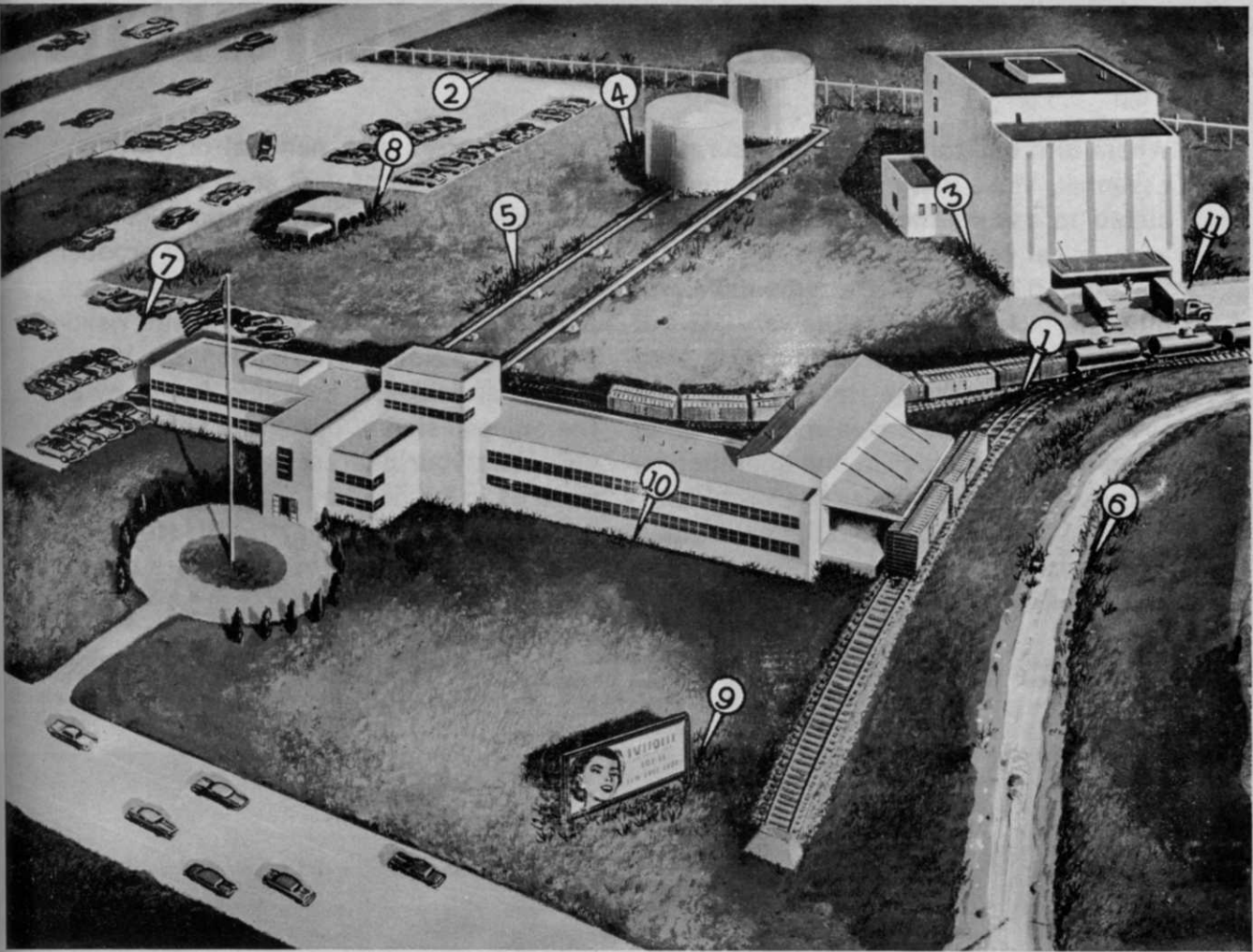
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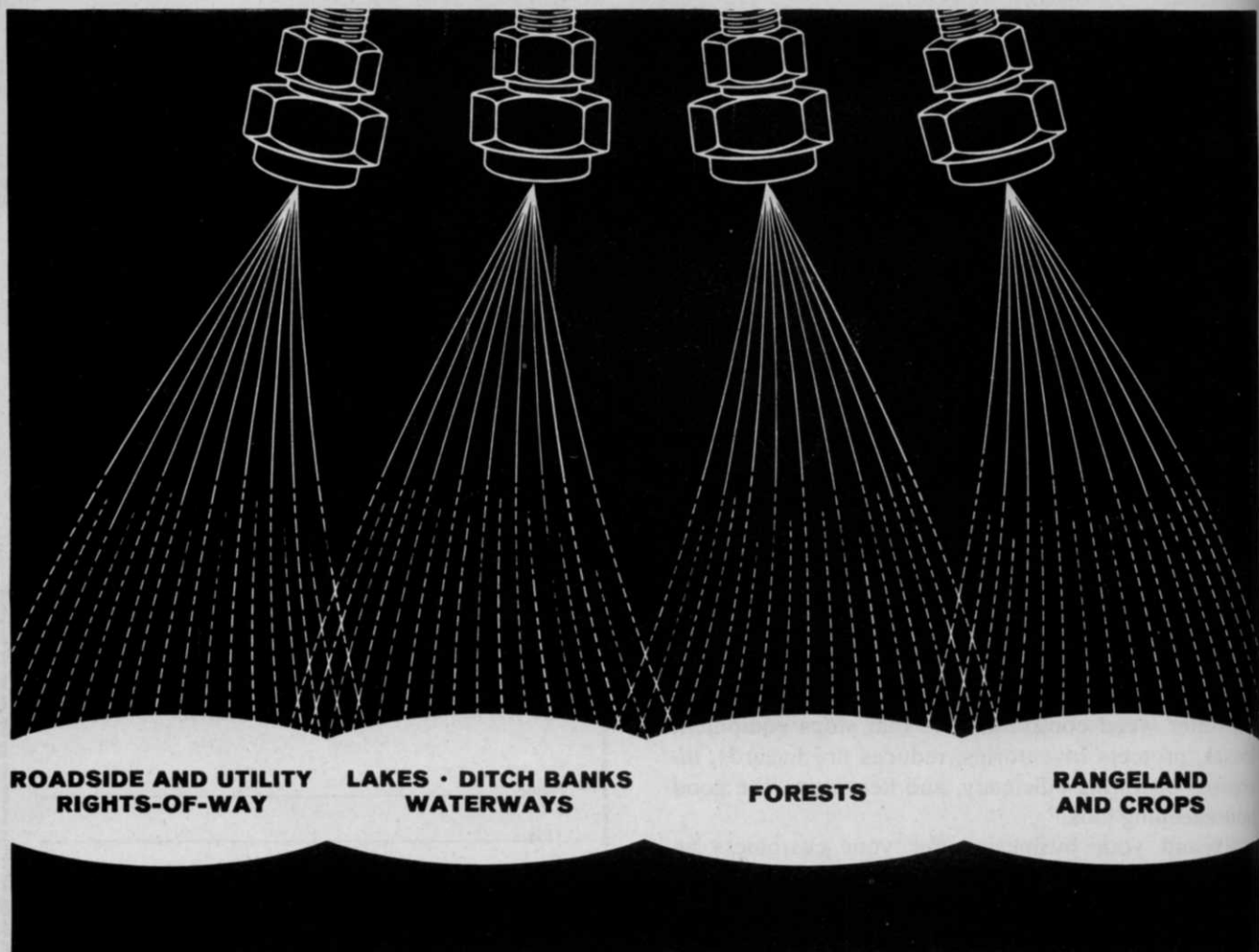
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The Cover

Airboats have proved their worth for aquatic weed control. In the Everglades they are the only practical

means of transportation.

Spraying water hyacinths with diquat in a continuing test program is this unit of ARS, USDA, Fort Lauderdale, Fla. Operation is at the Loxahatchee National Wildlife Refuge, Delray Beach, Fla.

Three scientists plus 10 research technicians, aids, and secretaries keep this section of ARS operating. Biologist is Robert D. Blackburn. Dr. Lyle W. Weldon serves as weed scientist and Dr. Karry Steward is physiologist. Research hinges around chemical
(Continued on page 37)

WTT Mailbox

Dr. Chappell Speaks

I would like to take issue to a statement appearing in your WT&T Vol. 7 (4) on page 30 made in an article on spray drift. You stated that "They (esters) are likely to drift further than the amine form . . ." The basic ester or amine salt will drift equally far depending on the formulation, carrier, diluent and equipment used. The oil soluble amine formulations, in my opinion, and based on experimental applications, will drift as far or further than most ester formulations. Water soluble amine formulations usually result in larger droplets than emulsifiable esters and will drift less under a given set of conditions. I believe that you should limit the above quote to water soluble amines.

I enjoy your WT&T magazine, it contains a lot of good information.

W. E. Chappell

Professor of Plant Physiology
Virginia Polytechnic Institute
Blacksburg, Virginia

WEEDS TREES and TURF

June 1968

Volume 7, No. 6

FORMERLY WEEDS AND TURF

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Census Is Valuable Tool

The population census for 1970 will shortly be on the agenda for each of us. We believe it is a valuable tool despite the view of some who feel that it violates the Constitutional right to privacy.

Perhaps it does. Especially should it come to pass that information on individuals would be fed into a Federal Data Bank.

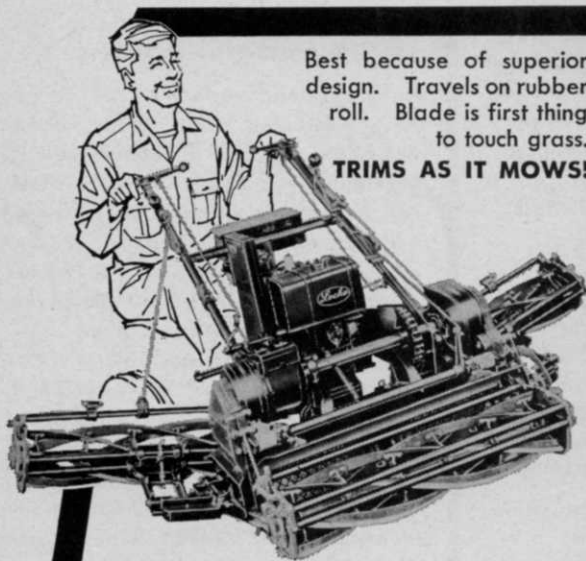
But the detailed information asked of a cross section of us produces extremely valuable information for industry. Because businessmen use this information to determine the size of the total market in countless fields, we are a bit surprised to note that the National Federation of Independent Business, Inc., reports that 83 percent of the independent businessmen in a survey made by the NFIB opposed the questionnaire. We rather think they opposed the fact that citizens are required to answer or face the penalty of law, which incidentally can be a maximum of \$100 fine and 60 days in jail. Frankly, we've never heard of anyone being fined or going to jail for refusing to

answer, but in this day and age, we suppose such is possible if "Uncle" so deems it.

Nevertheless, we believe the Census is worth the time and effort involved. We have individual rights, but we also have some obligations to a nation which has treated most of us far better than most of our fellow nationals around the world could hope for.

The Census produces a wealth of information. Information on crops when considered in terms of food supply and population growth gives valuable help to numerous types of agribusinesses. Size of the work force in various occupations is another valuable bit of information.

The Census may not directly aid your business, but it certainly helps the suppliers who serve you. It may prevent overproduction in one sense and help maintain a higher price, but at the same time, knowledge of the market does assure you that your machinery and supplies for doing business will be produced and waiting. We just happen to believe that competition between companies within a given industry will keep the price in line.



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Labor + Equipment = Work

Efficiency Equation for Tree Crews

By Theodore J. Haskell

Assistant Director, Lansing Parks and Recreation Department, Lansing, Michigan

SHADE TREE OPERATIONS have changed. In my 18 years experience, these have come

about by forces both inside and outside the organization. Two such forces are "annexations"

and "Dutch elm disease."

Such forces have called for changes as we profited by experience, research, and an exchange of information. Each time there is change, we reevaluate and reorganize.

In our Lansing shade tree operations on streets, parks, and golf courses, work involves service, pruning, line clearing, planting, removal, disease and insect control, plus other special projects.

Our crews are made up to handle these operations, and they are given the equipment to do the job. Naturally, factors affecting crew makeup will vary from city to city. But in general, such factors include policies, standard practices, recommended practices, expedients, emergency procedures, custom, and traditions. Sometimes the steps become so meshed over a period that it is difficult to separate them. A systematic approach can be used to make changes necessary to solve problems.

I think one method of problem solving is to consider how all factors relate to Labor, Equip-

Haskell's Conclusions:

Street tree operations are growing. Work loads and production factors are changing. Today there is a need to keep in balance the equation of labor plus equipment converted into work.

For example:

1. Review the entire operation when one or more of the following factors change:
 - (a) labor
 - (b) equipment
 - (c) job requirements
2. Get the most possible from equipment by:
 - (a) regular maintenance
 - (b) keeping up to date on new developments
3. Manage manpower by:
 - (a) selection
 - (b) orientation and training
 - (c) promotion as skills and ability increase

Hand labor as we knew it 10 years ago no longer exists. It has been priced out of use by national trends in mechanization. Future of the industry lies in skilled men and improved machines. These must be combined and recombined into efficient units to meet changing needs.

ment, and Work. These 3 items can be put together in equation form such as: $L + E = W$. In such an equation you can add, subtract, multiply, or divide, and you will maintain the equality as long as you treat both sides of the equation the same. If labor (inputs) plus equipment (inputs) equal work (outputs) you will have efficiency regardless of size of the operation. A balanced equation means an efficient operation, whether you deal with 10 men or 100.

Once a change in "inputs" disturbs the equation, correcting changes must be made in the operation. For example, if a stump cutter is added, you are right in expecting more stumps to be removed for the same labor input. If such is not the case, then a careful check is needed to find out why not. You cannot afford to waste manpower by having men or equipment on the job and not in use.

Changes which occur from forces outside the control of management must be matched by changes inside management. Short term "outside" changes might be such things as men getting sick, men going on vacation, equipment breakdowns, storms or weather changes (vital in spring planting), and other types of emergency work.

Long term changes include changes in the quality of labor as men on the job gain skill, as wages rise, and as other men retire. Other long term changes occur as equipment is improved (good examples are chain saws, mist sprayers, and tree movers), cities grow, trees grow, new diseases such as DED appear, new insect pests create serious problems, and environmental changes produce drastic effects on shade tree populations.

Management in the face of change depends on making the best use of available resources. To do this, you need a system of

controls which include: a work order system; a time record system; and materials control. Reports on these items will help assess what was done on past operations and also help make sound judgements in the face of change.

Many Equipment Changes

A good example of the effect of change on management is the chainsaw. During the past 12 years, use of the chain saw has restructured tree removal operations.

Old tree removal methods were based on slow take down time. Hand saws were used in trees, and cross-cut saws for felling or bucking operations. These involved 3- and 4-man removal crews that cut down the tree in big pieces and piled the brush. Later, brush and wood pickup crews cleaned the area. With the chain saw, it is no longer necessary to make big cuts. One man in a tree can drop brush so fast that it is now practical to maintain a brush truck with driver for immediate hauling. Most of the time, brush and wood do not need to be first piled, then handled a second time in loading and moving. Rather than the original 3- or 4-man crews, followed by a 2- or 3-man loading crew, a single crew of 4 men with 2 trucks can now complete the operation. A clear saving of time is that required for the second handling of brush and wood.

On big jobs such as street widening where a number of trees are being taken down at the same time, we increase the size of the task force. We add to the number of units per crew so that we may have an aerial tower truck, a hydraulic crane truck, 2 brush trucks, and 5 or 6 men. By contrast, we may also have small operations where only a 2-man crew is necessary. Adding men and equipment is effective only so long as they

can be kept busy. It is the function of supervision to assess and adjust the labor and equipment inputs to the work at hand.

Stump Removal Aided

Modern methods have also aided stump removal. Formerly, the system was the old wedge-and-sledge method. Chain saws have made it possible to flush-cut trees in many park areas or private yards. And where the entire stump must be removed, such as in an intensive park area or particularly on the street, the new stump cutters have proved their worth.

One "task force" we organized this spring consisted of 2 stump cutters pulled by tractors, 2 two-ton trucks used for hauling away chips and bringing dirt in to fill the holes, a tractor with front-end loader to eliminate hand shoveling, plus a pickup truck for the foreman. This unit of 6 men and eight pieces of equipment averaged 75 street stumps per week. During their best week, they removed 96 stumps. With a 3-man unit, we had been averaging only about 20 stumps per week.

Planting operations have made progress equal to that of other areas of the business. We have come far since the so-called "2-horsepower" methods of moving trees. Formerly, trees were dug with a pick axe, frost point, and sledge hammer. We now use air compressors for digging in frozen ground. Trees are moved by mechanical means when possible. In our Lansing operation, we have adapted a front end loader by removing the bucket and installing hooks for raising the trees. The operator is now able to see clearly while picking up the tree and setting it in the hole. We also use a Prentice hydraulic crane on a service truck which makes an excellent tree moving device. Hydraulic action gives almost finger tip control for lift-

ing, lowering, and final positioning of frozen balls up to 6 feet in diameter.

When space is available for equipment, we use a back hoe to dig around trees which are to be moved. We also use the back hoe to dig the hole at the new planting location. Here again, we have the use of equipment combined with skilled labor to either increase the work output or decrease the time required for the tree moving operation.

Efficient Spray Operation

Efficient spray operation depends on the number of trees that can be covered per hour. Best technique must be determined by the pest and by the material to be used for control. These factors determine the type of equipment needed. Until 1954, we used hydraulic sprayers. Often the refilling time equaled the spraying time. In some cases, we felt lucky when we averaged 12 trees per hour. Then came development of the mist sprayers and use of concentrated sprays. These made it possible to handle the more intensive spray programs needed to fight DED. Our early machines had a 100-gallon capacity and required a 3-man crew including operator, driver, and a scout-public relations man. In recent years, development of the larger 300-gallon models has made it possible to spray almost 3 times the number of trees for the same basic labor costs. Thus our work equation has changed as follows:

$$\text{For 1958} - L + E = W$$

$$\text{For 1968} - L + 3E = 3W$$

Among miscellaneous equipment for modern tree operations is the brush chipper. The chipper will save from 4 to 6 times on hauling cost. Still another modern piece is the hydraulic crane unit for loading logs, moving trees, and handling storm dam-

age. Aerial tower trucks are also quite new and can be used for trimming and removal operations. We have found 2 additional uses for the aerial units. We use them to replace the floodlight bulbs on our lighted ballfields. We have also found our unit excellent for taking "aerial views" of our park installations.

Each city's work-environment program is somewhat different. Thus, you must base your work and your decisions on your experience and research, along with the exchange of information with others in the field.

You Are the Manager

Employees are the hands that do the work. The city forester must know his men. Management means combining men and machines into efficient operating units. I personally favor the "task force" or "teams" system better than permanent units. I don't think we can afford to let custom freeze the "L" factor in the work equation.

Good supervision, naturally, begins with orientation. Time spent on orientation gives men a faster start. Whether an employee is a new recruit on his first assignment or a veteran on a new job, it lets him know what is expected.

The quality of labor results from your own ability to teach men how to work, and to make them want to do a good job. This quality factor involves skill, experience, and supervision. One point to emphasize here is that there is the well-known difference between 5 years of experience, and one year of experience 5 times over.

Whatever your system of appraisal may be, it is a good idea to shift men around over the course of a year as you make up your task forces. This allows you, the supervisors, and the foremen to observe men under different conditions.

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Golf Course Designed For Senior Citizens

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SEEDING newly built golf courses can pose a problem, especially when heavy rains followed by drought combine to foil the effort. This was the case with the new 18-hole course of Rossmoor Leisure World at Cranbury, N. J.

This course was built for senior citizens as part of a new community designed by Rossmoor Corporation, a development organization. Home buyers in the new area expected a course ready for late season play in 1966.

Ross W. Cortese, head of the Rossmoor group, solved the problem by buying 79 acres of sod from Princeton Turf Farms, Inc. Sodding began in late summer and was completed over a

2-month period, in time for some fall play. Cost to Rossmoor for sod and installation on the course approximated \$200,000. It serves golfers who live in the present 596 home units of the community. More are being built in the development managed by James E. Cooper.

Princeton Turf supplied Merion bluegrass for the 90-foot wide fairways and Penncross bentgrass for greens. Roughs were reseeded.

Rossmoor Corporation also builds senior citizen communities and golf courses in other areas. Two of these, in Maryland and near Chicago, along with the Cranbury, N. J. course, were designed by golf course architect Desmond Muirhead. Muirhead is

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a partner with golfer Gene Sarazen.

Course Part of Community

In the case of these courses, Muirhead was especially concerned with the relationship of the golf course to the community. He stressed to Rossmoor planners the need to avoid the pitfall of surrounding the course with houses, or, at the extreme, surrounding each fairway with a double line of houses. Rather, Muirhead preferred to keep the golf course intact. In this way, the entire community could enjoy it. A road circumventing the entire course would provide the advantage of a park-like green area. This in turn would open up many handsome views for the benefit of the surrounding community.

The Rossmoor course in New Jersey has been built on 130 acres of gently rolling terrain. Muirhead designed both roads and course to insure efficient use of land. No large triangles of unused space are found in the final course plan. This flexibility enabled the best golf terrain and golf holes to be selected and incorporated in the final course area. Also, for the benefit of players, no holes face due west into the sun.

Muirhead was also involved with the landscape. A golf course should be beautiful, he believes, rather than a group of tees and greens coming to a point. A well-planned course, he says, is a thing of logic and sequence with a road around it. Then an entire community can benefit with a view of trees and lakes.

Landscape Design Emphasized

"A golf course should, in fact," Muirhead says "be treated as a large landscape design." For instance, although many trees have been planted, at Rossmoor Leisure World, gaps left at intervals allow fairways to inter-penetrate. This increases the sense of spaciousness and permits formation of vistas and panoramas for

both auto traffic and golfers. Once the trees are mature a tour of each fairway, from tree to green, will unfold a variety of views.

Though stress has been placed on beauty in the Rossmoor courses planned and built by Muirhead, course design for benefit of players has been foremost.

For senior citizens, Muirhead felt, new criteria in specifications were needed. It is obvious, he says, that courses 7000 yards in length which are laid out with Jack Nicklaus and other touring pros in mind are not too popular with golfers more than 52 years of age. Generally, the drives of the latter players average well under 200 yards. Extensive studies were made and questionnaires distributed among prospective players to find what these senior golfers preferred. Results proved to be somewhat different than the normal conception of a golf course.

Thus, Rossmoor Leisure World's New Jersey course became a carefully tailored unit, built to match the hitting power of the players. Average drives, computed from other Rossmoor senior courses, also were found

to be between 150 and 210 yards.

Length of the holes was adjusted accordingly. Par 4's and par 3's are genuine 4's and 3's for the players concerned and not par 5's and par 4's as they are on many championship courses. For instance, the par 3's run from 160 to 100 yards instead of 220 to 180 yards, which is average for so-called championship courses. "Any par 3 over 160 yards or par 4 over 410 yards are par 4's and par 5's for the ordinary golfer," Muirhead reports.

The total length at the Cranbury course varies from 6355 yards down to 4590 yards. This is effected by large tees and 2 or 3 tees per hole, which, together with changing pin position on the greens, gives the course infinite variety both in length and playing characteristics. Thus the course can be adjusted to the players or to the tournament. Playability can vary from an interesting challenge for a low handicap senior golfer to a relaxed frolic on "Ladies Day." A long, regular, and short set of tees avoids any stigma to the male golfer playing from the ladies' tees, and allows women

Elwood C. Tatum, general manager of Princeton Turf Farms, Inc., Princeton, N. J., left, and Field Foreman Vince Grubb, also of Princeton, discuss sod delivery schedules.





Rossmoor Leisure World's sod is carefully installed on this section of the 120-acre golf course. As summer drought cancelled hopes of the grass seeding on its own, 79 acres of turf was ordered to carpet fairways and greens. Only grass in the roughs will be left to rely on nature.

to play from the regular tees if they so desire.

Nine-Hole Courses Vary

Since many Rossmoor inhabitants like to play only 9 holes, the course has been varied so that each 9 is somewhat different. Care has been given to see that the overall unit for the 18 is maintained. Each 9, from the different tees, is also of a different length. The lengths range progressively downward from 3200 yards as follows: 3100, 2900, 2700, 2600, and 2400 yards. Most all tastes are catered to.

At every stage the New Jersey course is challenging, according to Muirhead. Holes are carefully organized to challenge a player regardless of whether he hits short, medium or long. For example, No. 3 hole is unique. A 4-fingered lake folds into the fairway with a tee against each fold, so that the hole plays from 160-180 yards per water, and for a championship senior tournament from 160-110 or 75 yards from the different tees. The green and rear trap are designed to increase the permutations by which the hole can be played.

Holes such as this obviously add great potential value to a course.

Hole No. 4 which will play around 500-400 for the average player, has lakes and traps placed to hinder only the long-hitting seniors. Other fairway traps have been reduced to a minimum. Each trap has been carefully placed to test the better golfer and longer driver. Traps near greens, and the greens themselves, are planned so they can be easily viewed from the hitting area, and in order to hold a long iron approach shot. Length of the hole is varied so most every club can be brought into play.

Grades around the greens are constructed for easy maintenance with a gang mower. Rolls are light and so placed that approaches close to the pin will produce even putts. Wilder approaches will putt over a roll or a rise.

The 2 large lakes on the New Jersey course cover 7 acres and are entirely lined with large strips of 10 mm. plastic sewn
(Continued on page 34)

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In Brief:

Inland water management today demands the services of the professional aquatic biologist. Among the few in the business is Francis H. Bezdek, Lisbon, Ohio. In a WTT interview, he cautions the beginner about some problems of going into the business and indicates a need for a closer working relationship between government and private aquatic endeavors. Bezdek lists a number of areas where research is needed to help the field biologist solve problems encountered daily. Among these are: prevention of handling losses with live fish; determining why fish often die from sudden water temperature changes and prevention of such; how to economically and quickly add oxygen to water during a heavy weed kill; developing an economical means of removing and marketing organic wastes accumulating in the bottoms of lake and ponds; and development of less costly aquatic weed control methods.

Inland Water Management Creates Demand For Aquatic Consultants

WTT interviews Francis H. Bezdek, Consulting Biologist, Lisbon, Ohio, and one of the few specialists available in the nation in this discipline

Question: We've been aware for some time of the need for aquatic weed control in the more tropical areas and in some of the heavily populated seaboard states. But management of inland waters appears to be a new problem for the non-crop vegetation control industry. Is it national in scope?

Bezdek: Yes, but especially across the eastern half of the U.S. You'll find the landscape honeycombed with ponds and lakes of all sizes. These are continually increasing in number. More and more city residents are seeking building sites near water for summer and permanent residence. Commercial use of inland water is also increasing.

Net result is more pollution of both new and established bodies of inland water. Lakeside living

and use of water causes a build-up of pollution. This, in effect, fertilizes the water to the point that aquatic weeds thrive. Fish and wildlife are restricted and the water becomes practically worthless for recreation or other use. As this comes about, property values drop and owners become concerned. They seek help, and more often than not, find that qualified help is not available in their area. Thus, there has become a great need for the consulting biologist who understands aquatic problems and inland water management.

Question: Why the apparent shortage of consultants in this area?

Bezdek: Probably because the problem is relatively new. Some 25 years ago, when I was a

young, government biologist, except for industrial and domestic needs, water was treated as a surplus and recreational resource. This included the fish. The question even arose in print as to whether wildlife management was a piddling profession for grown men. There were fewer people living near inland water, and less ground contamination from their byproducts. Thus there was less of a weed problem in waters.

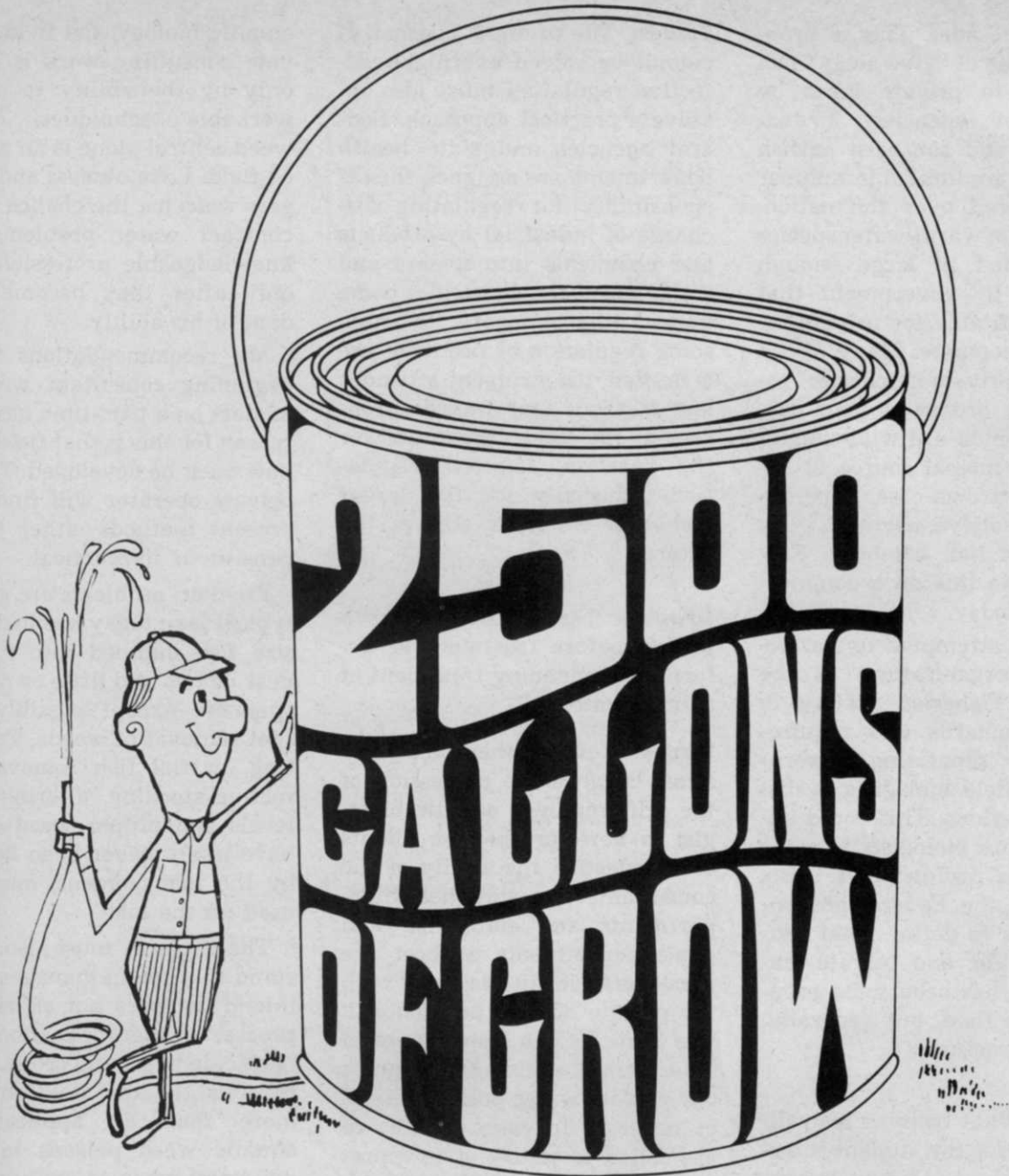
Young men in the field of biology and related areas were then being prepared for careers in state and federal agencies, or in the teaching field. This was logical. But accelerated aging of water impoundments has suddenly created the massive aquatic weed problem of today. More men are needed in private industry for inland water management. Yet the training available for the young biologist still favors government agency work. This will change because of the demand for the qualified aquatic consultant.

Question: You speak of the qualified aquatic consultant and the fact that few are available. What qualifies a man in this area?

Bezdek: To work in this area, a man needs to be trained and equipped to provide management and recommendations to lake owners. In travelling the eastern half of the U.S., I find no freelance aquatic biologists. When I speak of management, I have in mind techniques which are within the financial limitations of private enterprise and individuals, and practices which have proved effective.

I think many biologists and aquatic research people will agree with me that field biology is often far removed from that in the classroom. Some so-called classroom biology just is not practical for the inland lake owner who is having problems.

Further, private fish culture has changed little during the



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past few decades. This is probably because of "give-away" fish programs to private lakes by government agencies. Trout, minnows, and southern catfish hatcheries are limited in number and scattered over the nation. The common warm-water species are provided in large enough quantities by government that it is unprofitable for private industry to compete. Many of the so-called "private hatcheries" today simply broker or haul fish, many of which are wild-caught, as their principal source of income. In my own case, I operate a private walleye, northern pike, and hybrid fish hatchery. Few operators do this on a commercial scale today.

We have attempted to encourage such organizations as the American Fisheries Society to set up standards and requirements for separating government and field biologists as distinct professions. This could encourage more biologists to enter the field as professionals. Also, we believe the Federal government needs to define what constitutes public and private waters. There has been some progress in this field, but generally, it is discouraging.

Question: What training is available today for the student interested in a career as a private consultant in aquatic biology?

Bezdek: Most courses in aquatic biology today, as I indicated earlier, are still slanted toward teaching and government agency careers. This must change and will as recognition of the needs become more common. Some corporations are now hiring full-time aquatic biologists, particularly those producing, testing, and applying chemicals for aquatic weed control.

Question: Much about water pollution is in the news. To what degree do you feel government regulation is effective?

Bezdek: The problem is great. It cannot be solved overnight. Effective regulation must also involve a practical approach. Federal agencies and state health departments are assigned the responsibility for regulating discharge of industrial by-products and chemicals into waters and the atmosphere. Pesticides come under this category. Though some regulation of pesticide use is needed, too stringent attitudes and methods may impede progress in the field. But to answer the question, effective regulation, especially for the larger bodies of water, is still in the future.

Question: Do you do your own testing before treatment or before recommending treatment of private waters?

Bezdek: Yes, but there are problems. Because the profession of the self-employed aquatic biologist is new, prospective clients often question the ability of the consultant. Also, state health departments and state fish and game departments at best are uncooperative in dealing with the private aquatic professional. The State Health Department of Ohio usually refuses to recognize our private water pollution tests as accurate in cases where we are called to testify or to represent a client. We find this even though we use standard Public Health guidance procedures. This I think points up the gap between public and private endeavors in the field of aquatic management. Time and the demands of the job will solve many of these differences.

Question: You have pointed up the need for professional aquatic consultants. Would you recommend this for the young biologist just out of school or with limited experience?

Bezdek: The future is unlimited for the courageous few. Armed with training in wildlife and

aquatic biology, the field of private consulting work is limited only by the ability to develop workable techniques. Aquatic weed control alone is an unlimited field. Lake owners and managers welcome the chance to subcontract water problems to a knowledgeable professional, but only after they become confident of his ability.

My recommendations for the beginning consultant would be to start on a part-time basis. The reason for this is that field know-how must be developed. The new private operator will find many present methods either too expensive or impractical.

Further, problems are great. A typical lake today has had catch-size fish dumped into it every year or two and little or no management, except possibly some spot removal of weeds. Test-netting, partial fish removal, corrective stocking, altering water levels and proper weed control have likely never been heard of by the management, much less used on the lake.

The beginner must also understand that sound management of inland water is not as simple a process as the application of an herbicide to ground crops. A professional in the field must be more than an applicator of aquatic weed poisons to know what and when to apply to such a delicately balanced group of variables as found in water impoundments.

The private operator has to allow for time in the laboratory to iron out field problems with water, especially with the profit motive in mind. Some methods and tools are too expensive for some jobs. A chemical cost of \$50 or more per surface acre plus application costs may be prohibitive. I frankly feel that more basic research must be slanted toward useable field biology. The industry today could stand less professional competition and a closer working relationship.

Question: You mention the need for more basic research aimed at the field level. What do you specifically have in mind?

Bezdek: There are a number of urgent problems. A few are: how to prevent handling losses with live fish; why do fish often die from sudden water temperature changes and how can this be prevented; how to economically and quickly add oxygen to water during a heavy weed kill; control of reproduction in fish such as sex-linked sterility, or sterility produced by certain feeds or radiation; an economical means of removing and marketing organic wastes accumulating in the bottoms of lakes and ponds; and how to produce warm-water fish to catch-size economically as has been done with trout.

Question: Can you elaborate on the problem of organic wastes which fill lakes and ponds? This seems to be a problem area which is largely untouched.

Bezdek: There is an unlimited market for the rich, organic detritus accumulating in the various lake and pond bottoms, if an economical or profitable means of removal can be developed.

For example, I recently visited a 1000-acre lake in Michigan. Engineers had found the clear-water depth to be only 10 feet. But below the clear water was a layer of soft organic muck 25 feet in depth. It would seem that a portable, barge-mounted, slurry pump, coupled with an attached baling device could be developed for removing this product. There would be no problem in marketing this material since it is excellent humus for building topsoil, if in a salable condition such as in 50-pound cakes.

Removal of this material would be the equivalent of returning the lake to its primeval condition, reduce the weed problem, and open an avenue to better gamefish populations.

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how seedlings respond to

Phosphorus

By George McVey

Scotts, The Grass People, Marysville, Ohio

Phosphorus availability can be critical in the development and growth of Kentucky bluegrass seedlings. As little as 0.07# phosphoric acid (P_2O_5) per 1000 sq. ft. will cause a seedling growth response on phosphorus deficient soils. In studies conducted by the Research Division, O. M. Scott and Sons, tests were run in the greenhouse to determine the phosphorus requirement of turfgrass seedlings for optimum growth and development.

Initial testing revealed that in the absence of phosphorus there was no response to added nitrogen or potassium during the first 14 days after application. In the following 92 days, growth occurred but yields were very low. In Fig. 1, you can see, also, that growth was excellent at both phosphorus rates during the first 14 days. However, final yields were greater at the higher phosphorus rate.

The first tests also showed that a 3-1-1 ration of N, P_2O_5 and K_2O produced much more growth for the 15 week test period than a 1-3-1 ration on a phosphorus deficient soil. The two ratios had given nearly equal results during the first two weeks.

Further tests were begun to discover the least amount of applied phosphorus that will stimulate growth in seedling bluegrass. The plants were grown in

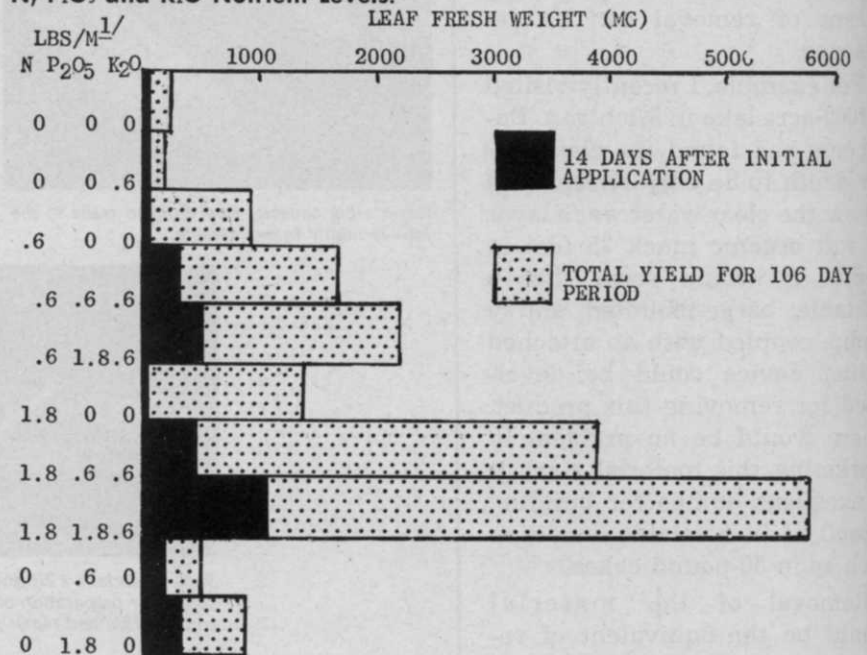
a phosphorus deficient sandy loam which had been treated with 0.035# to 0.60# P_2O_5 /1000 sq. ft. Rapid growth occurred with the application of 0.07# or more.

The affect of KPO_3 (potassium metaphosphate) and KH_2PO_4 (potassium phosphate mono basic) as sources of phosphorus was examined also. Their citrate solubilities were 65% and 100%, respectively. The test showed that the phosphorus source had little influence on the pattern

of seedling response, however, KH_2PO_4 produced slightly higher yields. (Figure 2).

Other experiments showed seedlings responding to added phosphorus on soils varying in phosphorus availability. (0.23 to 0.66# available phosphorus/1000 sq. ft.). Plants grown on soils with high levels of available phosphorus demonstrated a moderate response to additional phosphorus during the first two weeks of growth after applica-

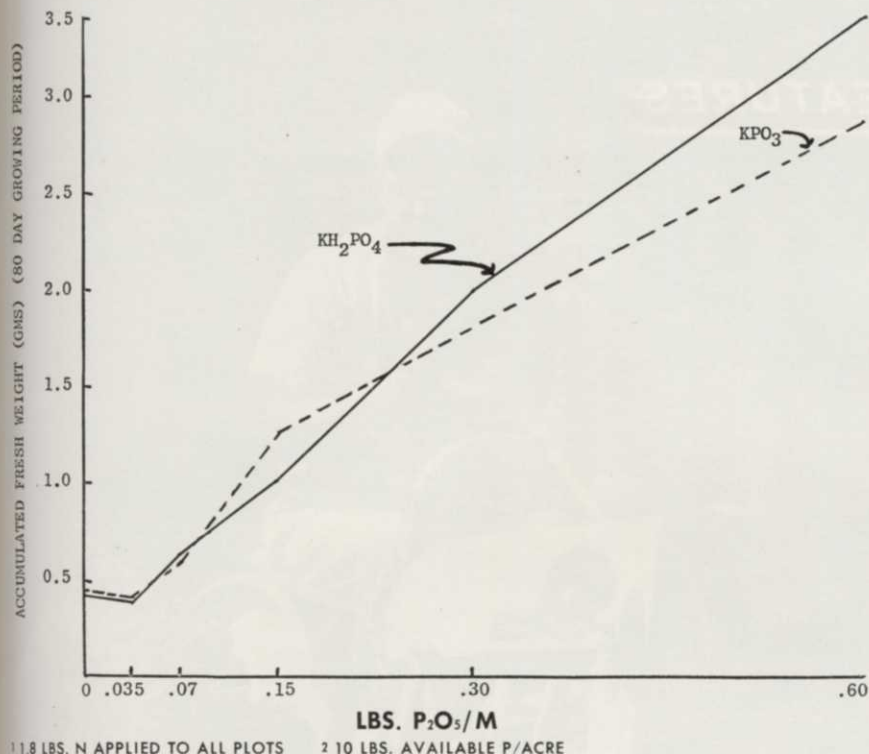
Figure 1. Fresh weight of Bluegrass Leaf Tissue As Influenced by Various N, P_2O_5 and K_2O Nutrient Levels.²



^{1/} P & K APPLIED 8-11-66, N APPLIED ON 8-11 & 11-11-66

^{2/} SOIL ANALYSIS: AVAILABLE P/A: 100 LBS, TOTAL P: 0.04%
AVAILABLE K/A 342 LBS, SOIL PH 7.0 FLORIDE: 0.35%

Figure 2. Phosphorus Uptake and Leaf Tissue Fresh Weight of Bluegrass As Influenced by Various Rates and Sources of Phosphorus.^{1,2}



tion. Later growth was not notably affected.

In conclusion, these studies indicate the optimum level of available P₂O₅ for the development of healthy, vigorous Kentucky bluegrass. Even on soils with relatively high amounts of available phosphorus, a positive growth response occurs when additional phosphorus is applied, and a sturdier stand of bluegrass may be obtained.

Fungus Can Kill Maple Leaf Tissue

Anthraxnose, a fungus that kills leaf tissue on maple and other hardwood trees, has been detected in Minnesota, says Joe Vargas, University of Minnesota research assistant in plant pathology.

Dark spots—large, small, circular or irregular—or dead areas on leaves may indicate fungus injury. On sugar maples, anthraxnose is detected by large green-brown or red-brown areas along leaf veins. Affected Nor-

way maples display purple to brown diseased tissue along leaf veins. On Japanese maples, the leaf often becomes blackened and shriveled.

Vargas says anthraxnose spreads rapidly after rains. While the disease does not always seriously damage a tree, it does mar its appearance. Anthraxnose can also defoliate and weaken trees, making them more susceptible to winter injury.

Vargas recommends zineb, captan, and some mercurial compounds for control of the disease. The first spraying should be in the spring when leaves begin to unfold, the second 2 weeks later. In case of an unusually wet year, trees should be sprayed again in summer. Fertilizer used as a supplementary measure will improve the vigor of trees weakened by repeated anthraxnose attacks.

For more information, ask your local county agent for U. S. Dept. of Agriculture Home and Garden Bulletin No. 81.

Meeting Dates



Symposium and Field Trip, Spring Dead Spot of Bermuda, University of Georgia, Tour begins at Capitol City Country Club, Atlanta, Ga., then to University at Athens at 8:00 p.m., June 11.

Turfgrass Sprinkler Irrigation Conference, University of California Extension Conference Center, Lake Arrowhead, Calif., June 21-23.

Purdue-Michigan State Weed Day, Purdue University Agronomy Farm, Lafayette, Ind., June 25.

Tri-County Chapter, California Landscape Contractors' Association, 17th Annual Convention, Ojai Valley Inn and Country Club, Ojai, Calif., June 25-29.

Landscape Seminar, Associated Landscape Contractors of America, Inc., for Michigan and Ohio, Dearborn Inn, Dearborn, Mich., July 13.

American Association of Nurserymen, Annual Convention and Trade Show, Chase-Park Plaza Hotel, St. Louis, Mo., July 13-17.

Georgia Seedsmen's Association, Annual Convention, Stuckey's Carriage Inn, Jekyll Island, Ga., July 14-15.

National Fertilizer Solutions Association, 1968 NFSA Round-Up, Regency Hyatt House, Atlanta, Ga., July 25-26.

Lawn and Utility Turf Growers Field Day, Rutgers University, College of Agriculture and Environmental Science Campus, New Brunswick, N. J., July 30.

Golf and Fine Turf Growers Field Day, Rutgers University, College of Agriculture and Environmental Science Campus, New Brunswick, N. J., July 31.

Indiana Association of Nurserymen, Summer Meeting, Imperial House Motel, Columbus, Ind., Aug. 7-8.

Midwestern Nurserymen's Summer Meeting, Zelenka Evergreen Nursery, Grand Haven, Mich., August 13-14.

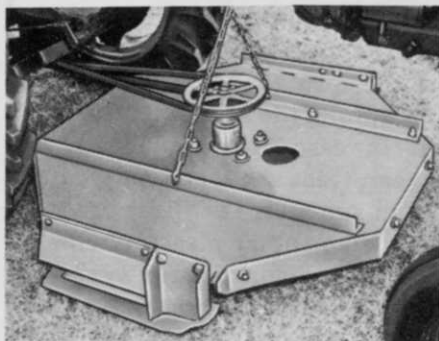
1968 Turfgrass Field Day, Pennsylvania State University, Joseph Valentine Turfgrass Research Center, Campus, noon August 21-noon August 22.

Hawaii 4th Annual Turfgrass Management Conference, Punahou School Campus, Honolulu, Hawaii, August 21-24.

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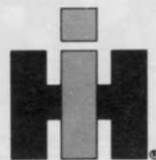
Another big reason for Cub's wide acceptance is its water-cooled engine. The Cub power plant outlasts ordinary air-cooled engines. And the entire Cub is built rugged—from transmission, clutch and hydraulics to the tough final drive.

Low initial cost and upkeep are still other Cub Lo-Boy advantages. Cub will work all day long on just 7½ gallons of gas. Maintenance, parts and tires are compact-priced.

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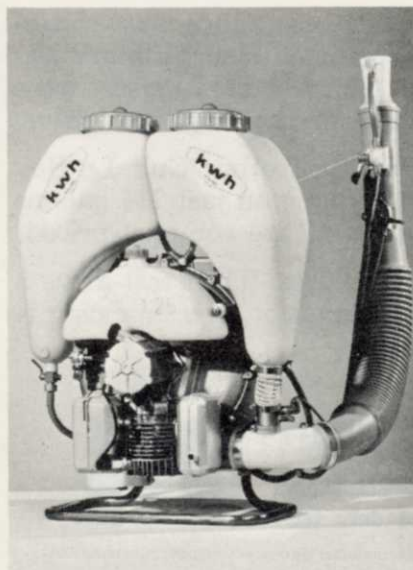
A grounds sweeping machine designed to work on both turf and paved surfaces is now offered by the Turf-Vac Co., 3342 Olive, Long Beach, Calif. 90807. Operating without brushes or rakes, this Turf-Vac Model GPU provides a 4-ft. sweep at speeds up to 10 mph. As the sweeping action is produced by a vacuum system, the unit can be used on wet or dry, paved or grassy surfaces. Its mulching system reduces dry grass and leaves to fine particles, tin cans to quarter-sized pieces. The debris is caught in a 27-cu. ft. capacity nylon bag for easy handling. Powered by a 24-HP Kohler engine, the rust-proof fiberglass van has a short 30-in. turning radius. Ground speed is controlled through a separate hydraulic system that allows the blower to run at a constant speed for maximum efficiency.



New, safety Wire Screen MonoGoggle (model 208) has been offered by American Allsafe Co., Inc., 273 Niagara St., Buffalo, N. Y. 14213. With an anodized aluminum screen lens designed to reduce glare, the goggles provide eye protection from impact and flying particles and resist pitting, scratching and fogging. Flexible and lightweight, they conform easily to facial contours.



Vandermolten Export Co. introduces lightweight Knapsack Mistblower-duster, designed for greater power plus ease of handling. Only 20 lbs., the unit is powerful enough to spray 40 ft. high. It provides deeper penetration and better coverage in addition to saving time, says Vandermolten. Write the co.: P.O. Box 967, West Caldwell, N.J. 07006.



Rental Equipment Mfg. Co. has recently made available to the consumer public its "Blue Bird" Lawn Comber. With a rotor of free-swinging, case-hardened steel blades (that adjust easily according to need), the unit literally "combs" out the thatch in lawns. A crank control permits combing depth to be adjusted so that the Lawn Comber can be as gentle or as severe as the job demands. The unit can also be used for such tasks as breaking up heavy dirt clods, turning in rye grass and cutting out crabgrass. Available with a 4- or 6-HP engine (or with no engine), the Comber is guaranteed for 1 year by Rental Equipment Mfg. Co., 2778 South Tejon, Edgewood, Colorado 80110.



Robert Niedermann (left) and Lee Kelnhofer chart customers on their schedule board.

Tractor "Mounties" Provide Custom Lawn Care Service

Red trailers toting a fleet of garden tractors indicate that special "mounties" are at work in the Milwaukee area this season. Their rescue mission: to relieve homeowners from the burdens of lawn care and maintenance.

Non-gardening homeowners can now go golfing or vacationing while a Lee Services, Inc. "mountie" mows, edges, trims, leaf-sweeps, thatches, fertilizes and treats their lawns for weeds and diseases, according to Lee Services. Customers—including doctors, cardiac patients, widows and salesmen who travel a great deal—are systematically charted on a schedule board. Lee's says it is equipped to handle all landscape maintenance operations for the home, school, hospital or industrial plant.

From a 1-man operation catering to 23 customers in 1965, Lee's enterprise now enlists the services of 11 mounties who serve over 250 customers. According to Lee Services' Lee Kelnhofer, they are enlarging their new building to double its present

shop size and will expand their tractor fleet from 14 units to 35.

Kelnhofer is particularly pleased with one aspect of his operation: the discovery of a healthy and useful new "career" for retired men. Gray-haired grandfathers become excellent tractor operators who can be proud of their landscaping skills, says Kelnhofer.

Lee Services feels it is a "growing" business in more than one way as it reports that franchises are planned for extending the operation to other cities.

A Lee's "mountie" diligently at work.



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George R. Ferguson, president of Geigy Agricultural Chemicals is heading the 1968 Agricultural Chemicals Campaign on behalf of the nation's 3 million 4-H members. The campaign, geared to help turn out young people who have a fuller understanding of the impact of modern technology on the problems of world food supply and environmental health, also promotes international good will by providing special training for rural youth of developing nations. Ferguson, holding a Ph.D. from Ohio State University, has been with the Geigy Chemical Corp. since 1945.

Construction Site Trees Need Special Treatment

A little care before construction starts can save many trees which would normally die later. Once the construction plan is laid out, the decision on which trees are to become a permanent part of the new landscape plan can be made.

Trees which are to be saved should then be fenced for protection. Dr. Fred B. Widmoyer, horticulturist at New Mexico State University, Las Cruces, N. M. suggests a barrier around each tree which encloses all exposed roots and low hanging branches.

Where trenches must pass near such trees, construction crews need to be alerted to cut as few roots as possible, and where roots must be cut to cut them cleanly. Widmoyer also suggests painting cut root ends with a wound dressing and backfilling

the trench as soon as possible to prevent roots drying up.

NLNA To Publish New Landscape Directory

The "National Directory of Landscape Firms" will be published shortly by the National Landscape Nurserymen's Assn. to assist customers in locating qualified landscaping firms.

The directory will list members of the NLNA, the Associated Landscape Contractors of America and the American Association of Nurserymen according to the size job they will undertake, type of contract they handle, and whether or not they offer maintenance service.

"With this easy reference directory," says Roger Ingels, NLNA president, "any potential customer can quickly find the firm that can do his type of job."

The directory will be available free to those interested in letting contracts and will be distributed to landscape architects, government agencies, building owners and highway departments.

Root Girdling Can Cause Severe Shade Tree Damage

Just by cutting a root, you may improve the health or save the life of a shade tree, reports the National Arborist Association.

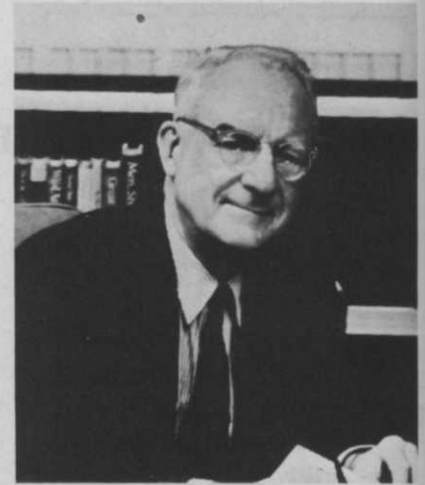
When a secondary root develops and grows into the parent root stem, it exerts pressure against the stem and impedes the passage of moisture and nutrients to the upper parts of the tree. This destructive secondary root is known as a girdling root.

Signs of girdling root injury include yellowish leaves, branch die-back, and smaller tree size and yield than normal. Affected trees seldom die suddenly but decline in health over a period of several years.

In treating an affected shade

tree, sever the girdling root at the point of development and remove it completely. To hasten the tree's recovery, the NAA recommends an application of fertilizer, removal of dead wood, pruning of weakened branches, and watering during drought periods.

Dr. Grosvenor Heads 1968 Landscape Awards Program



Dr. Melville B. Grosvenor, chairman of this year's Landscape Awards Program, has served as president and editor of National Geographic. Among his many and varied activities, he is Chairman of the U. S. Interior Secretary's Board on National Parks, Historic Sites, Buildings and Monuments and serves on the board of trustees of several colleges.

Dr. Melville B. Grosvenor, Chairman of the Board of Trustees and Editor-in-Chief of the National Geographic Society, has accepted the chairmanship of the American Assn. of Nurserymen's 16th Annual Landscape Awards Program.

Designed to pay tribute to businesses and organizations that excel in landscape beautification, the program has recently been expanded, in part, to take fuller advantage of the new impetus brought to the beautification drive by Mrs. Lyndon B. Johnson. Award categories now include institutional, commercial,

municipal, and industrial organizations.

Among his duties as chairman of the program, Dr. Grosvenor will preside at the awards luncheon to be held in Washington, D. C., on October 22.

Tiny Wasp May Stem Dutch Elm Disease

A tiny wasp collected by a USDA entomologist in France may help curtail Dutch elm disease by destroying the elm bark beetles which cause it.

The wasps affect only the beetle larvae, which they parasitize, and are harmless to humans. Female wasps can thrust their egg-laying organs through the bark to deposit an egg beside the beetle larvae. The egg hatches into a wasp larva that kills the immature beetle by drawing its body juices.

Although the wasps will not endanger their food supply by eradicating the elm beetles, they can provide sufficient control to prevent an epidemic of Dutch elm disease.

Turfgrass Industry Hears Congressman MacMathias

Maryland's rapidly-growing turfgrass industry has been urged by Congressman Charles MacMathias to "use your special knowledge, talents, and services to help insure the beauty and attractiveness of our land in this period of suburban growth and development."

The Congressman talked to more than 100 participants at the recent third annual sod conference at the University of Maryland.

Pointing out that Maryland is the fifth fastest growing state in the nation, Congressman Mathias said sod growers, installers, contractors, and land-

Clean up roadsides, ditches, or any noncrop land with MBC. MBC is a nonselective herbicide—spread or spray it on and it kills top growth almost on contact, leaches into the soil to attack roots, sterilizes soil for at least a season.

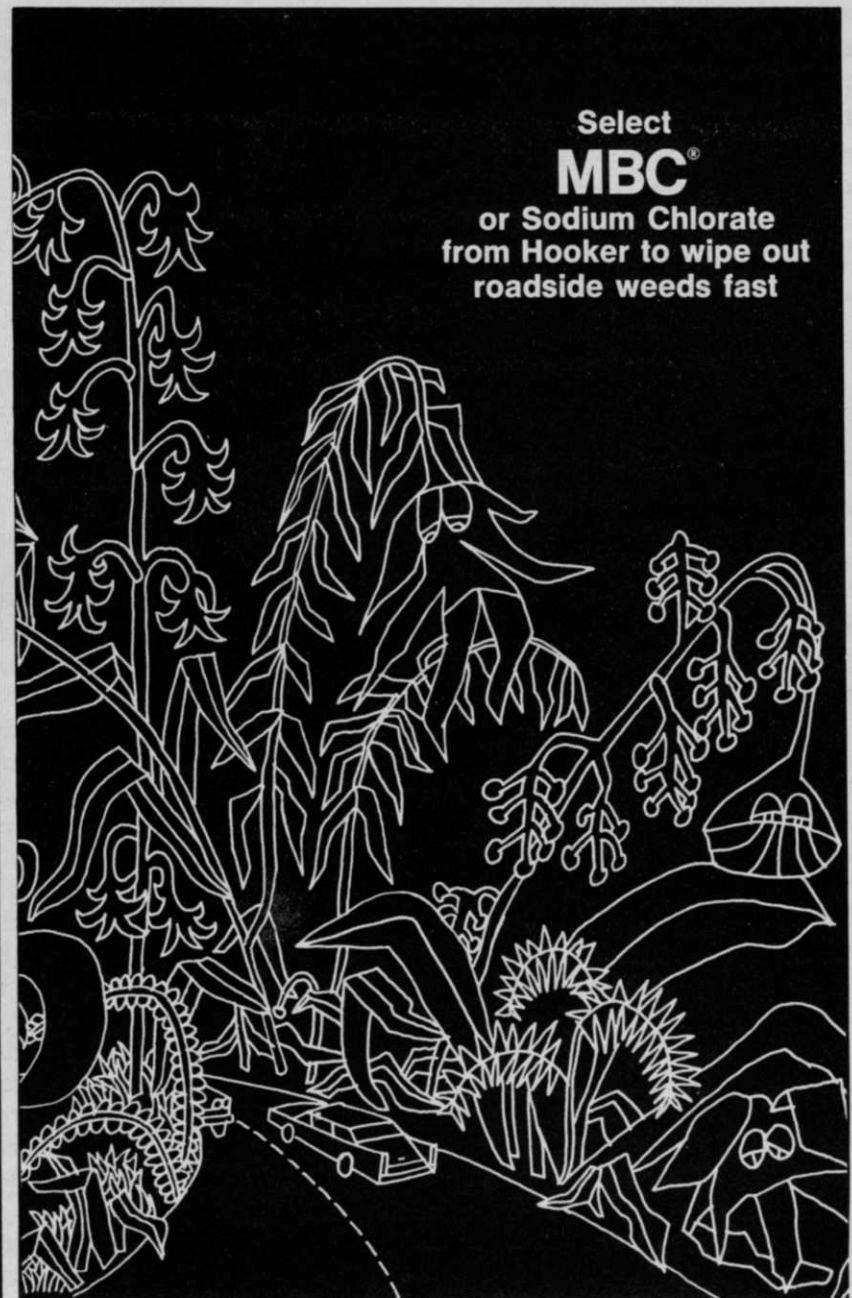
MBC completely eliminates Johnson grass, bur ragweed, hoary cress, and other troublemakers.

Also for low-cost control along roadsides or on smaller areas such as fence lines and around power-line towers, try Hooker Sodium Chlorate. It gives you control over all weeds and protects against their return for up to two years.

For more information on these powerful killers, write Agricultural Chemicals, Hooker Chemical Corporation, 406 Buffalo Avenue, Niagara Falls, N. Y. 14302.



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roadside weeds fast

scape architects are facing an important challenge to help keep Maryland green. Growth feeds upon itself, he said, and pressures on land use will be even more intense in the counties around our cities. To avoid "slurbs," a slum-like blight of suburban areas, all the knowledge and skills you can muster will be needed," he said.

Industry-wide standards, uniform specifications for growing and installing sod, and a Maryland sod law to help protect the public and assure orderly marketing and development of the industry drew attention at the day-long meeting. "The home builder, architects and other buyers should be able to purchase sod by specifications and be sure of what they are getting," Dr. Elwyn Deal, turfgrass specialist, University of Maryland, told the group.

Leafspot and Foot Rot In Bluegrass Lawns

Leafspot and foot rot—also known as "melting out"—occurs when bluegrass decreases in vigor and eventually fails to respond to fertilizer and water.

According to Ohio State University studies, symptoms of the disease include the appearance of dark or reddish-brown spots on leaves and the shriveling and browning of leaves and stems. Patches of the lawn appear to "melt out," and crabgrass invades the areas of dead grass.

R. E. Partyka, OSU plant pathologist, reports that the disease most severely attacks common Kentucky bluegrass.

To reduce disease damage, says Partyka, avoid over-fertilization. Mow the lawn at a height of 1½ to 2 inches, as a lower cut depletes the grass' food supply. Remove the clippings after cutting

because the fungus may be in or on them.

Chemical control consists of spraying lawns with a fungicide at 10-day intervals in the spring. Or, apply a fungicide as soon as the turf greens up, to be followed by a second application in 3 weeks and a third in 4 weeks. If the disease persists, several fall applications are advisable.

Fungicides recommended by OSU studies include: Dyrene, Tersan OM, Captan, Fore, Zineb, Daconil 2787 and Kromad. Follow directions and use five gallons of water for every 1,000 sq. ft. of lawn area, says OSU. For better results, OSU recommends adding a small amount of household detergent plus enough pressure to drive the spray to the base of the plant.

Diagnosing and Treating Nematode Troubles

Nematodes — slender, microscopic roundworms or eelworms—feed on plant roots and are a real threat to turfgrass. Diagnosing nematode injury is difficult, reveals R. E. Partyka, plant pathologist at Ohio State University, and is often confused with fertilizer burn, nutrient deficiency, poor soil aeration, drought and insect damage.

Partyka describes nematode-injured turf as bunchy, stunted and often yellow in color. Grass blades die back from the tips. Later the turf may thin out, wilt and die in irregular areas with no specific symptoms on the plants. Damaged roots may be swollen, stubby and dark in color.

Since nematodes cannot be detected with the unaided eye, soil samples from a suspected area should be diagnosed in a laboratory. (Contact your State Land-Grant University).

If nematodes are present, keep grass growing vigorously by watering, fertilizing and following

good cultural practices. If severe, Partyka recommends applying Nemagon EC-2 or Fumazone 70E at the rate of 1½ to 2 pints mixed with 10 to 15 gallons of water drenched on 1,000 sq. ft. of turf.

Water the turf immediately after application to insure penetration and to prevent toxic effects. Treat in the spring or fall when soil temperature is above 55°. Aerifying the turf before application improves results. Do not apply chemical to newly seeded areas.

Heavy Water, Fertilizer May Cause Grass Wilt

To help prevent wilt, water grass less frequently and don't apply fertilizer during the wilting season, reports Harry Meusel, Yale University.

Meusel explains that wilt occurs when grass loses more moisture than it absorbs. Heavily watered grass has twice as many surface pores as lightly watered grass and will lose moisture faster and wilt sooner at temperatures above 70° F. After fertilization, heavily watered grass wilts even more quickly because more water evaporates from the plant.

Light intensity, which affects the size of surface pores, also influences wilting. Grasses in shaded areas wilt more slowly than those in sunny areas.

Meusel recommends that a phenol mercuric acetate solution applied to grasses can help control wilt. This closes the pores of the leaf. But the best safeguard against wilting is a strong root system.

Heavily watered grass usually has short, stubby roots because moisture is readily available near the soil, whereas lightly watered grass has long, thin roots that reach deep into the soil and are less susceptible to wilting.

MSU's First Turf Class Is Graduated, Placed

The first graduates of Michigan State University's Turfgrass Management Technical Training Program are now "on the job," receiving starting salaries ranging from \$6,000 to \$10,000 per year.

MSU's new 18-month program combines 4 terms of classroom training with 2 terms of on-the-job experience. Classroom instruction includes, aside from English and business courses, such areas as: principles of turfgrass management, soils and soil fertility, botany, chemistry, plant pathology, entomology, irrigation and drainage, turf equipment, and maintenance of trees and shrubs.

Applications for the program, which begins in September, are now being accepted by Robert LaPrad, Institute of Agricultural Technology, Room 120, Agriculture Hall, MSU, East Lansing, Mich. 48823.

Treatment for Webworms On Honey Locust Trees

Brown, webbed-together foliage in the tops of a thornless honey locust or mimosa tree indicates probable mimosa webworm infestation.

Richard L. Miller, Extension entomologist at The Ohio State University, says that first-generation webworms appear in late June, with a second generation appearing in August. Generally a number of larvae cooperate in building nests about $\frac{3}{8}$ in. in diameter, although a single larva may web 2 or more leaflets together and feed inside the enclosure. These nests may occupy most of a tree's foliage. Silken threads hanging from a tree is the result of larvae lowering themselves to the ground.

According to Miller, the webworm can be controlled with



MSU's first Turf grads and their instructors are: seated, left to right, Scott Sincerbeau, John Kosmalski, John King, Turfgrass Management Program Coordinator. Standing, left to right, Dr. James B. Beard, MSU Turf Specialist, Fred McMullen, Larry Jackson, Bruce Wolfrom.

either DDT or Sevin 50% wettable powder at 2 tbsps. per gal. of water. Thorough coverage of tree tops provides the best results.

Systemic insecticides are also effective, says Miller, but he recommends that a professional make the applications.

Safeguard System Protects Buyers or Pesticides

Fear not, pesticide buyers! According to Frank Boys, agricultural chemicals specialist at the University of Delaware, you can count on 3 safeguards for getting your money's worth in chemical quality and quantity.

Firstly, Boys points out that pesticide manufacturers keep daily records and samples of each batch of chemicals processed in their plants. This helps ensure that all pesticides maintain the same quality standards.

By referring to the batch number on the bottom of pesticide containers, buyers can obtain information on whatever pesticide they desire.

Inspectors of the U. S. Dept. of Agriculture Pesticide Regulation Division carry out another safeguard. They collect and analyze pesticide samples to ensure that the products contain all ingredients in the amounts listed on the labels of the containers. USDA inspectors also regularly check the effectiveness and safety of registered pesticides. If a product is found to be misrepresented in any way, steps are taken to correct the violation immediately.

The third safeguard is carried out by "backup teams" of state chemists and inspectors, says Boys. These people collect samples from manufacturers, distributors and users in all areas of the state and analyze them to further assure the validity of label specifications.



Penn - Delaware ISTC Chapter received a special award for this exhibit at the recent Philadelphia Flower Show.

Penn-Delaware ISTC Exhibits At Philadelphia

The Pennsylvania - Delaware Chapter of ISTC won a special award for their exhibit at the recent Philadelphia Flower Show, one of the oldest and largest Spring exhibitions in the nation. Joseph L. Hayden, flower show chairman for the Chapter, designed the exhibit which demonstrated various methods of beautifying city streets with trees. He used pits, boxes, and tubs. Also stressed was the fact that trees sometimes have to be removed. In this case, it proved to be a good example of a DED victim which was felled and bucked on the sidewalk.

Hayden reports that 100,000 persons visited the show during its 8-day run in Philadelphia's new Civic Center. E. George Maurer, Chapter president, Greenville, Del., adds that the effort put forth by Hayden and his committee in these last 3 annual exhibitions is industry public relations at its best.

The Pennsylvania Horticultural Society promotes the Philadelphia Flower Show and sponsors financially a number of educational exhibits such as the one constructed by ISTC.

MSU Making Progress In Red Fescue Research

Scientists at MSU's Agricultural Experiment Station have released a new red fescue but feel they can improve it even more. Drs. Fred Elliott and James Beard, MSU crop scientists who developed the fescue, say the seed will be ready for commercial use by 1970.

The variety, Wintergreen, is an improved red fescue that adapts well to shaded conditions and produces good turf with minimum fertilizer and water.

Researchers feel that improved breeding techniques now being developed will help them achieve their goal of developing a fescue that will adapt well to commercial sod production and require less water for growth.

New Fescue Developed By Northrup, King & Co.

Ruby Creeping Red Fescue, an improved turf grass for seed mixtures, will provide a more durable turf, according to How-

ard Kaerwer, Northrup - King turf specialist.

Retaining desirable fescue features (the ability to withstand heavy traffic and grow in shade and poor soil), Ruby also offers major improvements over less desirable features, says Kaerwer.

Describing Ruby as the "friendly fescue" that blends well with other lawn grasses, Kaerwer reports that Ruby provides improved mowing characteristics, resistance to disease and bunching, and a tolerance to high levels of fertility. Its spreading ability and color contrast with bluegrasses make Ruby ideal for use in turf seed mixtures, says Kaerwer.

Good Year Predicted for Wisconsin Sod Producers

Wisconsin's sod farms can look forward to another good year, according to R. C. Newman, extension horticulturist at the University of Wisconsin.

The state's sod industry has grown from 300 acres in 1958 to 8000 acres today. If home building is increased, demand for sod should improve with prices remaining at current levels, predicts Newman.

Under Wisconsin conditions, sod is a 2-year crop that is seeded in late summer, ready to be cut 12 to 18 months later. Currently valued at \$800 to \$1000 per acre, sod is a \$3,500,000 crop in the state. As transportation costs are high, sod must be grown near markets in large metropolitan areas such as Chicago.

According to Newman, potential growers should get expert advice regarding the feasibility of growing sod on their farms. Production problems include customer care, weed control, and the development of a description of sod quality.

Numerous Agencies Battle Florida's Aquatic Weeds

The State of Florida is losing out in a fight that's been going on for more than a decade against aquatic weeds in its fresh water lakes.

Various groups have been trying various methods of control and the result has been more water weeds than ever.

It is a two-part problem.

First, no one is quite sure just what is the most effective way to control or eliminate any one weed, much less all or most of them.

Second, no one has had a real opportunity to be effective since there is such duplication of effort and fragmentation of authority in existing programs.

Florida Governor Claude Kirk set up an Aquatic Research and Development Commission a year ago which has itemized the problems and come up with what it considers could be some solutions to the problem.

The Committee wants to invest heavily in research and establish a vehicle through which control programs can be coordi-

nated. The details are to be worked out with state, federal and local officials.

According to a preliminary study, during the fiscal year which ended last June 30, no fewer than 39 different agencies (14 state and federal, 25 district and county) spent more than \$1.3 million in an unsuccessful effort to clear Florida's lakes, streams and waterways.

In an effort to eliminate this vast multiplicity of effort and authority, the committee recommends creation of a coordinating agency under the Florida Game and Freshwater Fish Commission to handle all control, planning and research.

Another recommendation is that present county, district and area funding by millage or other tax be rescinded and operation monies come from earmarked sources and the general fund.

Legislation Is Sought

This would save some counties as much as \$35,000 per year, but the taxpayers probably wouldn't notice it because the committee estimates "not less than \$2.5 million yearly can ac-

complish this function effectively."

The preliminary report asks Florida's congressional delegation to introduce legislation which would make the state a center of nationwide research on aquatic plants.

"Florida, unfortunately," reads the report, "contains natural test areas for such research and development activities." On the other hand, "we have more trained talent and facilities to find the answers than any other area."

One of the weeds the committee is anxious to control is the water hyacinth. But the cause for most concern are two new menaces in Florida's fresh water, elodea hydrilla and Eurasian water milfoil.

These plants have spread "with unbelievable speed," according to the committee and "show graphic evidence of rapidly becoming 100 times more damaging than the floating hyacinth."

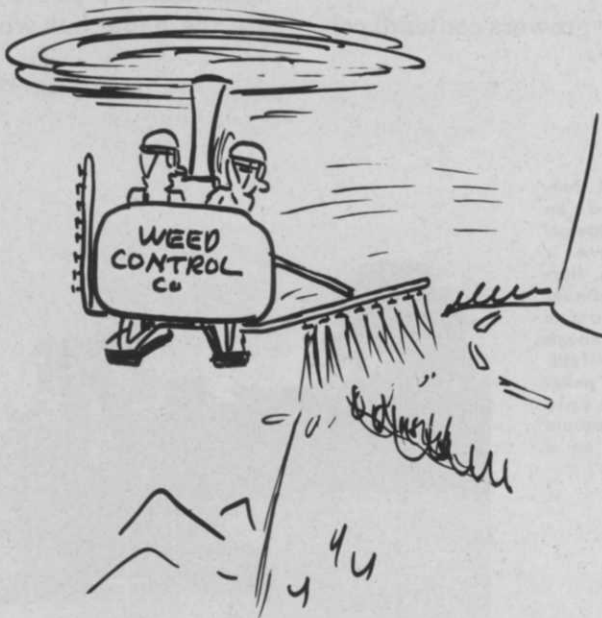
Elodea has almost choked the Crystal River in Florida and milfoil, which grows in both fresh and brackish water, has a 3000-acre foothold in the Gulf of Mexico at the mouth of the Homosassa River in Florida.

One of the major control problems, the committee points out, lies in the fact that elodea and milfoil cannot be clipped or cut in any way as a means of control.

The report contains engineering estimates that say unless a way is found to eradicate elodea and milfoil, drainage canals will have to be increased in size by 160 percent to provide necessary water flow.

There is a possibility water hyacinths could form the basis for a new industry which, in turn, would help control this floating weed, Florida officials say.

A machine which harvests, crushes and grinds hyacinths into a supplement for animal feed has been tested with success on the Peace River.



"YOU COULDN'T GET ME TO USE A TRUCK TO SPREAD THOSE WEEDS UP HERE. TOO DANGEROUS."



Bob Rapp, owner, left, and James (Jim) Walling, office manager, discuss current Rapp instant lawn orders.

Sales Savvy Is Business Management Key For Sod Producers Across the Country

Selling sod is becoming the key factor in the success of growers across the country. Growing a quality product requires the best in cultural practices. But growers have this facet of the business pretty well worked out. Harvesting practices are still undergoing changes and methods vary. But the crux of success seems more and more to be the ability to sell, and to collect the cash for the delivered product.

A good example of maintaining and holding a firm market is the Rapp operation at Farmingdale, N. J. Owner-manager Bob Rapp believes their secret in marketing has been control of sod from the field to the site where it will be installed. After 5 years in the business, he is convinced that the producer who is able to control the sale of his

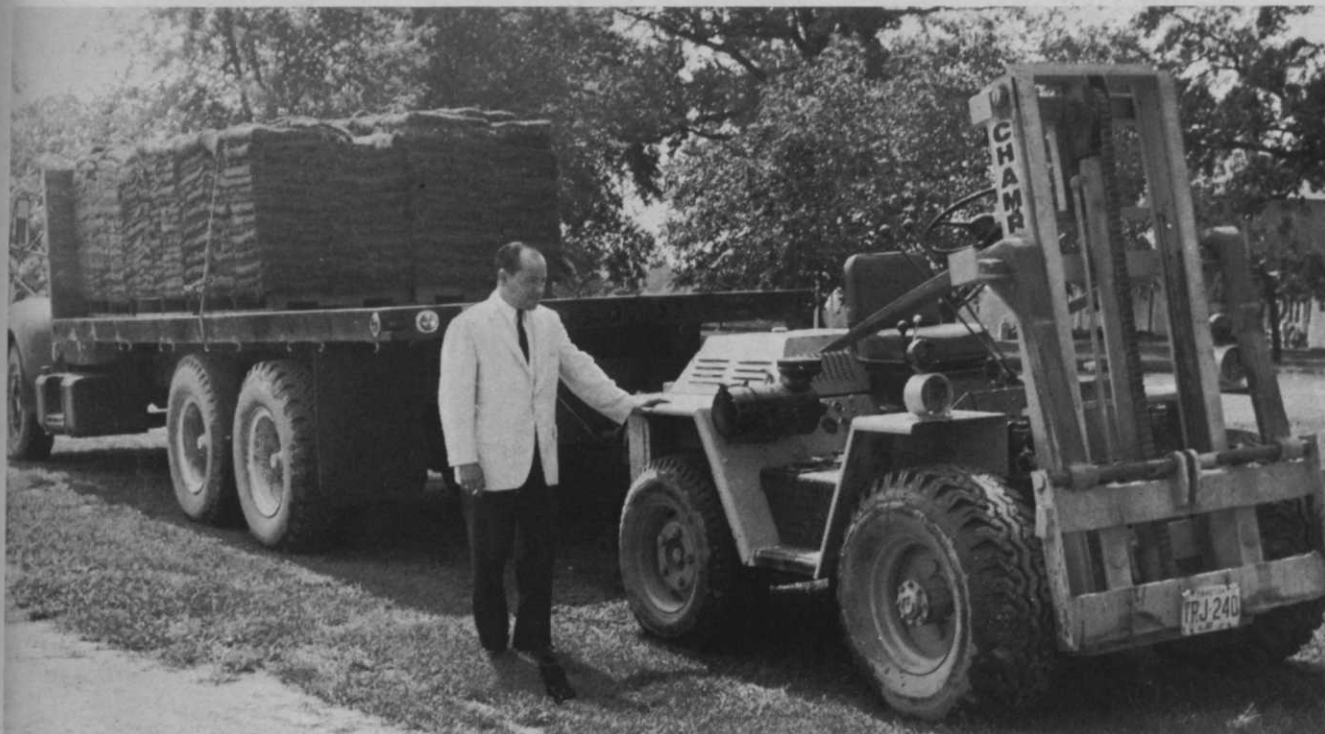
sod can better maintain his market.

As many growers contend, col-

lection from many borderline landscapers, primarily those who use the name but who are more

Princeton sod harvester is used on Rapp farms. Operating unit here is William Sachse. Harvester can handle up to 10,000 square feet per hour though Rapp finds men folding sod for pallet can handle only about 7000 square feet hourly on a day-long basis.





The Rapps tow a fork lift for unloading sod delivered at site. Bob Rapp, in picture, says that they have found this more practical than the boom which they have mounted on another Rapp truck. Forklift is used on local deliveries, up to 40 miles.

likely to be only part-time sod installers, can be a problem. Bob Rapp says they handle this problem by using a cash-on-delivery system. All Rapp sod is delivered on Rapp trucks and collection made before unloading.

Naturally this system of collection on the spot cannot be adhered to 100% of the time but works adequately for Rapp. He says established landscapers who regularly do business with the Rapp operation are handled on a regular billing basis. Others

must assure the office manager that the money will be on hand before the sod is lifted for delivery.

Rapp Instant Lawn farm grows about 200 acres of sod yearly on mineral soil. The demand is currently for Merion, Rapp states, and this variety constitutes the bulk of their production. Rapp finds the best time for lifting sod to be May 5 through September. He prefers to lift and market 2-year-old sod, which contrasts with the

preference of many growers, particularly those on peat or muck based soils who like to

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Loaded pallet from sod harvester is lowered and automatically slides into position on field to be picked up by forklift and loaded for transport. Employees are, left, Fran Hurley, and Oleboreo Miranda.

MSU Tips on Sodding For Rapid Rooting

Michigan State University studies indicate there are several important guidelines to insure successful sodding results.

For most rapid sod rooting, MSU specialists point out that sod should be cut $\frac{1}{2}$ to $\frac{3}{4}$ -in. thick. When laying sod, the underlying soil should be moist to give roots a better chance to establish themselves quickly and firmly.

MSU also recommends that soil for sodding be prepared just as it is for seeding. Avoid laying sod on a subsoil because grass does not readily take root in subsoil.



Fork lift, handled here by Charles Conrow, is used to pick up pallets behind harvest and load trucks for transport. The Rapps maintain two forklifts, one in the field and one which is towed behind a 10-wheel truck.

lift and market sod within a year after seeding.

A Princeton turf harvester is used along with forklifts to handle the palletted sod. Normal production from the harvester is about 7,000 square feet per hour, though the top capacity of the machine is somewhat greater. Two forklifts are needed, one in the field and one which is towed behind a 10-wheel delivery truck. Bob Rapp also uses two additional trucks which are tractor-trailers with mounted booms. These latter trucks are used for distant deliveries or those beyond 40 miles which is the practical limit for towing the fork lift.

Sod is sold to landscapers, garden centers, builders, developers, golf courses, and a few sales direct to homeowners. Rapp says the operation is equipped so that they can operate with only 8 men. This permits them to keep better quality labor, he believes, and to run a more efficient operation. Sod is generally harvested in the morning, and then can be delivered during the remainder of the day.

Seasonal variations have proved a problem to Rapp and other growers in New Jersey and surrounding states. Two years ago, the weather was so dry that one inch of irrigation water disappeared into the soil almost immediately. Rapp uses a portable irrigation system with Marlowe pump. By contrast, the next year was wet to the point that they found it difficult to lift and deliver sod.

Rapp found that the biggest boost to their marketing program proved to be a 4-color promotion folder. A professional photographer was hired to shoot both field and home site pictures and a folder planned to point up the value and beauty of the Rapp instant lawn. These promotion pieces were sent to landscapers, garden center outlets, builders, developers, golf course superintendents, and others who were prospective sod purchasers. This, Rapp said, put their product on the market and helped establish them in the industry. They believe it the single most important step beyond production of a quality product.

Turf Becomes Big Business For Pennsylvania

Pennsylvania Crop Reporting Service reveals that \$231,353,328 is spent each year on maintenance of turfgrass areas in Pennsylvania.

Areas surveyed by the Service included home lawns, schools, sod growers, golf courses, airports, athletic fields, cemeteries, churches, apartments, motel and hotels, parks, state highways, and the Pennsylvania Turnpike.

The 231 million dollar turfgrass expenditure includes \$66,557,307 value for unpaid family labor on 2,250,309 home lawns. Replacement value of turfgrass equipment in the state is \$333,908,568.

L. H. Bull, Secretary of Agriculture for the Commonwealth says that this makes turfgrass the largest single agricultural enterprise in the state. It was equal to 63 percent of the total cash receipts from the sale of all agricultural products for 1966.

BIG SAGEBRUSH

(*Artemisia tridentata*)



Drawing from: California Range Brushlands and Browse Plants, by Arthur W. Sampson and Beryl S. Jespersen. Calif. Agric. Expt. Sta. Ext. Ser. Manual 33.

Prepared by: O. A. Leonard, Botanist, assisted by B. J. McCaskill, Senior Herbarium Botanist, Botany Department, University of California, Davis, California

The genus *Artemisia* (a member of the Sunflower Family or Compositae) contains about 250 species, most of which occur in the arid regions of the northern hemisphere. There are both shrubby and herbaceous species. Most of them are aromatic.

About 96 million acres of the 683,389,000 acres of pasture and rangeland in the eleven Western states are in sagebrush, with big sagebrush (*A. tridentata*) the most abundant. Associates of this species are silver sagebrush, threetip sagebrush, low sagebrush, and black sagebrush. Coast sagebrush is common in coastal California and sand sagebrush in the southern Great Plains. Another common associate is rabbitbrush (*Chrysothamnus*) which is a poor browse species for both domestic animals and deer. On the other hand, bitterbrush (*Purshia tridentata*), also a common associate, is a favored browse species.

Big sagebrush is a much-branched, evergreen shrub from 1½ to 15 feet tall, usually with a distinct trunk and shreddy bark. The leaves are gray, wedge-shaped, typically with a 3-toothed apex,

from ¾ to 1½ inches long, 1/16 to 3/16 inches wide, and without definite petioles. The flower heads are small, consisting of 4 to 6 disc flowers and occur in dense, leafy panicles up to 4 inches wide. The seeds (fruits) are resinous-granuliferous achenes.

Several different methods have been used to control big sagebrush. The use of fire is one of the oldest and least expensive. Since fire, however, is not effective on sprouting herbaceous or woody plants, these may increase and become a problem. Rabbitbrush may take over and become a more serious problem than the sagebrush. Plowing and discing may be employed, but these operations destroy nearly all vegetation so the areas must be reseeded. After reseeding, however, sagebrush and rabbitbrush must be controlled to prevent invasion of the seeded areas. Spraying with herbicides can be employed to great advantage to maintain the grassland vegetation. Herbicides are also used advantageously on sagebrush lands to control old stands of sagebrush.

When big sagebrush is the dominant shrub, it can be controlled with an aerial application of 2 pounds of an ester form of 2,4-D per acre, applied in a few gallons of water plus a little diesel oil. Plants should be sprayed when they are growing vigorously and after the first new leaves have become fully enlarged.

When rabbitbrush occurs in sufficient amounts to be a problem, spraying should be delayed until the rabbitbrush has attained 3 inches of new twig growth and the quantity of 2,4-D should be increased to 3 pounds per acre. Such a spray should control most of the sagebrush and rabbitbrush if timing is proper and soil moisture conditions adequate for vigorous shoot growth. Once a stand of grass has been obtained, good grazing practices and occasional spraying with 2,4-D to control sagebrush and rabbitbrush seedlings will help maintain it.

Perennial grasses compete against big sagebrush, rabbitbrush and other woody species more effectively than annual grasses. However, on overgrazed sagebrush lands, perennials are eliminated to a large degree and annual grasses remain. A good practice on such lands is to seed perennial grasses after the woody species have been killed. However, the perennial grasses, when seedlings, often fail because they cannot compete well against annual grasses. A promising method of handling this problem is to spray directly behind a seeder with paraquat, which kills the annuals, often allowing the perennials to survive and take over in a couple of years. These areas, again, will slowly revert to sagebrush, etc. if not sprayed with 2,4-D periodically.



Poor turf area on fairway of Dauphin Island golf course was photographed in late July prior to treatment with compost soil conditioner.

Note same fairway area, below, on Dauphin course some 3 months later. At this time, bermudagrass carpets the entire area.



Mobile Soil Conditioners For Golf Course Balding

The Mobile Municipal Composting Plant, Mobile, Ala., has made available a product to help remedy bald spots . . . on golf courses, that is.

Mobile-Aid, an organic compost soil conditioner that contains beneficial bacteria to improve soil structure, is particularly effective, according to the producer, in soil that lacks nitrogen, phosphorus, potash and other elements necessary for healthy growth of grass and plants, says the company.

Test results on bald spots at the Dauphin Island, Ala., golf course are illustrated above. Because of the soil's sandy nature, areas on the edges of fairways repeatedly resisted attempts to grow grass. Late last July, 2 truckloads of Mobile-Aid were applied to several spots. Within 3 months, Bermudagrass carpeted these areas, even though it was not the prime growing season, says the company.

Mobile-Aid also tends to prevent wide variations of alkalinity and acidity, according to the company.

Golf Course

(from page 13)

together and back-filled with sandy material. This process insures conservation of water. These are believed to be the first golf course lakes so constructed in the eastern U. S.

Rossmoor Leisure World New Jersey is the seventh Leisure World course. Once the Rossmoor Leisure World Chicago course is completed, Rossmoor Leisure World will be among the largest owner of golf courses in the world.

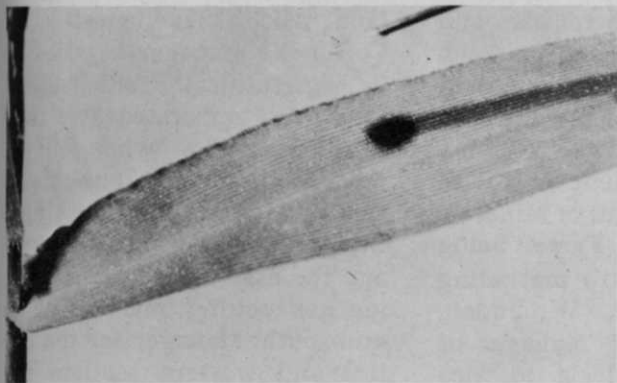


Figure 1

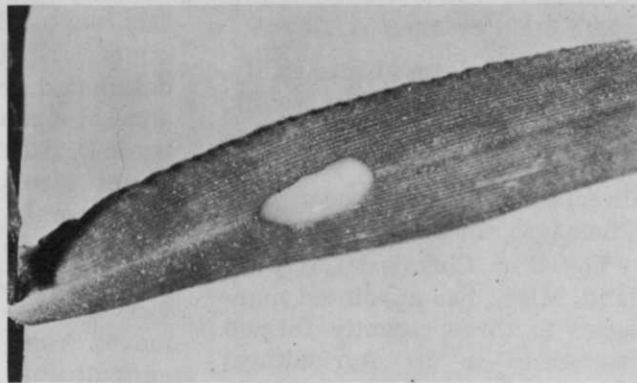


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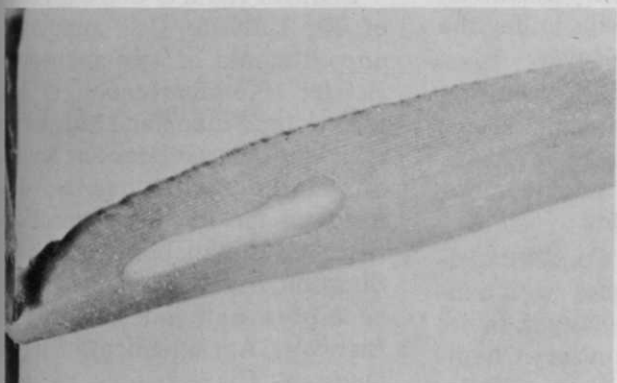


Figure 3

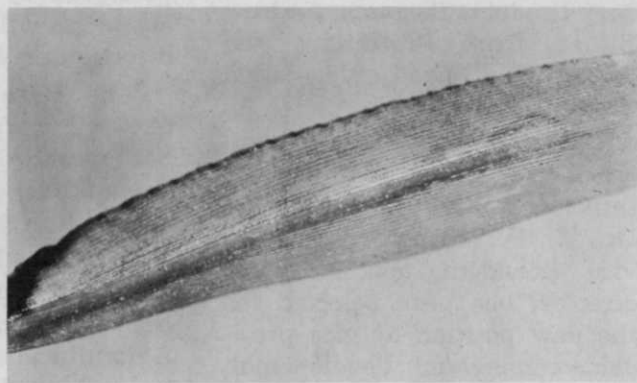


Figure 4

Photographs above, were taken at 25 to 30 second intervals to illustrate how T-MULZ AO2 emulsifier in an atrazine-water-oil mixture contribute to rapid spreading across weed surface areas for fast and complete kills of plants.

New Spray Emulsifier Designed for Spray Oils

On the market now is a new emulsifier, T-MULZ/AO2, designed especially for use with superior spray oils.

According to the manufacturer, Thompson-Hayward Chemical Company, Kansas City, Kan., T-MULZ was designed primarily for an atrazine-water-oil mixture. It has been widely tested and used during the past year, both for ground and aerial applications. The new emulsifier contributes to the rapid spreading of oil-atrazine across weed surfaces for fast and complete plant kills.

Comprehensive product studies have demonstrated unusual emulsifier characteristics in the application to T-MULZ AO2, particularly with respect to its spreadability, stability, solubility and performance characteristics.

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Suppliers Personnel Changes

Chemagro Corp., Kansas City, Mo., announces Hugh W. Swink, vice president-marketing, has been elected to its board of directors. Swink has been with Chemagro since 1951.

The Dow Chemical Co., Midland, Mich., has appointed managers to three recently formed businesses in its Agricultural Products Dept. They are R. M. Barbour, Livestock and Veterinary Products Business; Andrew Butler, Crop Protection; and James H. Gowell, Vegetation Control.

Armour Agricultural Chemical Co., Atlanta, Ga., reports three executive appointments. Dr. R. F. McFarlin, formerly vice president and technical director, has been selected for the new position of vice president-commercial development. He will be responsible for commercializing research and development project results, coordinating marketing programs in new areas of technology, evaluating industry technology and assisting in long-range planning. Dr. J. D. Nikerson has been named director of research and development and Dr. Clyde Reeder, manager of Armour's Atlanta Research Center.

Vistron Corp., a subsidiary of Standard Oil Co., Cleveland, O., has designated Allen E. Behn to manage operation of its new Oxco Brush plant, Cookeville, Tenn.

Fisons Corp., Wilmington, Mass., reports Paul B. Allen, Jr., has joined its technical staff and will serve as Fisons' western representative. He will supervise testing programs in the west.

Mobil Chemical Co., N. Y., has announced executive appointments in a major realignment of its agricultural chemical production and marketing organization. Richard B. Madden has named group vice president and will direct activities of three divisions — agricultural chemi-

cals, industrial chemicals, and minerals. J. P. Rogers has been designated vice president and general manager of the Agricultural Division. S. W. Carter becomes vice president of Mobil and general manager of Minerals Division with A. A. Farrell being named the division's marketing vice president. P. W. Judah, moves from acting manager of agricultural chemicals to vice president and assistant to the president of Mobil. Industrial chemicals will remain under the direction of W. P. Boyer.

John Bean Eastern Division of FMC Corp., Lansing, Mich., has recently selected Fred E. Freiheit as chief engineer for agricultural products.

Rohm and Haas Co., Philadelphia, Pa., announces a number of personnel changes in its Agricultural and Sanitary Chemicals Dept. William A. White, assistant manager of the department, has been given the additional position of agricultural chemicals product manager. James E. Thompson becomes assistant to White in the agricultural chemicals sales section. William R. Hughson, former product manager, has been named manager of the northern sales territory. He replaces James M. Graham, who will retire in December. Until retirement, Graham will handle special sales and development assignments. Gunther W. Skall, now in the New York City area, will transfer to the central territory. He will be replaced in the northeast sales territory by Craig A. Guthrie.

J. I. Case Co., Racine, Wis., reports Edward J. Campbell has joined its staff as general manager of the components division, Racine. He will be responsible for design and manufacture of all components produced by the three Racine plants and for design and production of agricultural tractors at the Clausen plant.

The Dow Chemical Co., Mid-

land, Mich., has named W. L. Corbin as manager of sales for its Agricultural Products Dept. Dow also appointed two field sales managers who will be responsible for marketing its agricultural products in the United States. Joe F. Kinman will manage the eastern sections, including key poultry markets of the mid-south. Manager for the central and western sections will be Howard W. Sheldon.

Elanco Products Co., a division of Eli Lilly & Co., announces appointments of two managers. Robert P. Moorman, Jr. has joined its Financial Division as manager of credit for the southern marketing regions. He will headquarter in the general offices in Indianapolis. Floyd L. Simpson has been named manager of a new sales district in Elanco's Agrichemical Sales Division. His territory includes western Tennessee, Mississippi and central and southern Louisiana.

Koehring Co., Milwaukee, Wis., reports John J. Hinnendael has been named controller. He replaces J. R. Aydelotte who will continue as secretary.

Brady, Des Moines, Iowa, a division of Koehring Co., has recently designated Marvin D. Van Peurse as chief engineer.

United States Testing Co., Inc., Hoboken, N. J., announces the appointment of David Argyle as manager of agricultural services at its Denver, Colorado branch. Argyle will be responsible for soil testing, fertilizer and irrigation recommendations and scheduling of plant tissue and leaf analysis programs.

Aeroquip Corp., Jackson, Mich., reports Don T. McKone has been elected president and chief operating officer. Peter F. Hurst, the company's founder, remains chairman of the board and chief executive officer.

American Potash & Chemical Corp., Los Angeles, Calif., announces two men have joined its

(Continued on page 38)

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" 10c per word, minimum \$3.00. All other classifications 20c 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. Bold-face rule box: \$25.00 per column inch, two inch minimum.

FOR SALE

PRIME TREE SPRAYING business located in Westchester County, New York, established 20 years ago. Gross volume approximately \$55,000 to \$65,000 a year plus considerable tree surgery work that is referred to other companies in the area. There is more than \$40,000 in equipment which ranges from office data processing machines to 600-gal. hydraulic sprayers. This also includes a modern 2-way radio network with three licensed base stations. There is approximately a \$5,000 inventory. This gross business is done in less than a seven-month period with a payroll of only \$12,500. It nets well in five figures plus other valuable considerations for its owner. The asking price is \$50,000, or we would consider selling the business and equipment separately. Terms arranged. Priced for a quick sale. List of equipment and inventory mailed on request. Mail inquiry to Mr. H. G. Widmark, Pres., Widmark Scientific Control, Inc., Drawer 151, Harrison, N. Y. 10528.

FOR SALE

SPRAYERS, USED, all sizes and makes, at large savings. Send your requirements. Equipment Sales Co., 4742 Sunrise Highway, Massapequa Park, N. Y. 11762.

REBUILT RYAN Sod Cutters with or without cutoff. Sharon Welding Company, 11674 U.S. 42, Cincinnati, Ohio 45241.

HELP WANTED

BRANCH MANAGER: To run office in Central Michigan area. Must be capable and aggressive salesman in the entire tree and lawn care line. The opportunity is unlimited for the right man who wants to work with one of the largest tree companies in Michigan. Salary open. Box 33, Weeds, Trees & Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

FIELD SUPERVISOR Industrial Weed Control firm in eastern Pennsylvania is looking for a field supervisor. Degree in one of the agricultural sciences is desirable but not necessary. Write Box 30, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

The Cover

(from page 5)

control of aquatic weeds, biological controls, physiology of aquat-

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ics, effects of herbicides on aquatic environment, and ecological studies. In this particular area of the Everglades they manage 78 aquatic weed research plots.

Boat pilot is C. Elroy Timmer and sprayman is Phil Sherman, both of the ARS contingent.

Insect Report

WTT's compilation of insect problems occurring in turfgrasses, trees, and ornamentals throughout the country.

Turf Insects

VARIEGATED CUTWORM
(*Peridroma saucia*)

Iowa: First moths of 1968 collected April 9 in Story County.

A SOD WEBWORM
(*Crambus bonifatellus*)

California: Adults heavy in lawns in Buellton, Santa Barbara County.

LESSER CLOVER LEAF WEEVIL
(*Hypera nigrirostris*)

Nevada: Adults light in lawn in Fallon, Churchill County, for a new county record.

Insects of Ornamentals

AN APHID
(*Aphis coreopsidis*)

Maryland: Collected on privet at Chevy Chase, Montgomery County, June 8, 1966. This is a new county record.

BOXWOOD LEAF MINER
(*Monarthropalpus buxi*)

Virginia: Larval damage heavy on American boxwood in Fairfax County; leaves poorly developed. **Tennessee:** Larvae, pupae, and adults on boxwood in Knox County; 1-2 per leaf on most leaves.

SPRUCE SPIDER MITE

(*Oligonychus ununguis*)

Arizona: Heavy on Italian cypress, juniper, and arborvitae at Tucson, Pima County.

A PIT SCALE

(*Cerococcus kalmiae*)

Ohio: Heavy on some azalea bushes in Lake County September 1967.

Tree Insects

SMALLER EUROPEAN ELM BARK BEETLE

(*Scolytus multistriatus*)

Wisconsin: High mortality in dead elm logs near Mazomanie, Dane County.

ELM LEAF BEETLE

(*Pyrrhalta luteola*)

Iowa: Adults active in homes in Sioux City, Woodbury County, and at Corydon, Wayne County. Wayne County is a new county record. **Colorado:** Adults active in many areas of State. **Arizona:** First instars and numerous egg masses on Chinese elm at Coolidge, Pinal County and at Tucson, Pima County.

SOUTHERN PINE BEETLE

(*Dendroctonus frontalis*)

Tennessee: Overwintering brood in loblolly and short-leaf pines; brood density and ratios of increase high in Anderson and Morgan Counties.

PINE NEEDLE SCALE

(*Phenacaspis pinifoliae*)

Washington: Viable eggs heavy under old scales on ponderosa pine in Kamiak Butte State Park, Whitman County.

Compiled from information furnished by the U. S. Department of Agriculture, university staffs, and WTT readers. Turf and tree specialists are urged to send reports of insect problems noted in their areas to: Insect Reports, WEEDS TREES AND TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

Safety "Do's and Don'ts" For Pesticide Storage

Any pesticide — insecticide, herbicide, fungicide, etc. — left over from last year should be carefully disposed of, says the U. S. Dept. of Agriculture.

Dispose of any container that has lost its label, the Dept. recommends. Don't save or reuse empty pesticide containers. Read and follow directions and precautions on labels every time you use pesticides. Don't rely on your memory.

Always remember that many pesticides can be harmful to both people and pets if they are not handled, applied and stored with care and caution.

"Up, Up and Away" Spraying Method A Winner

The war against Michigan crop diseases will be won in the air, contends Dr. Howard S. Potter, MSU plant pathologist. Aerial spraying is proving faster, better and more economical than ground methods, says Potter.

In many cases, aerial spraying provides a savings of both money and the amount of water required, according to Potter, whose figures show that aerial spraying costs average \$2.50 per acre, often less than ground spraying costs. Ground sprays often require 100 or more gallons of water per acre, while aerial spraying requires much less, says Potter.

Other advantages of aerial spraying cited by Potter are: ability to be applied to wet soil, elimination of plant damage and soil compaction, and better plant protection because concentrated fungicide residues on leaves are readily distributed by dew deposits and are less likely to be washed away by heavy rain.

Potter says aerial spraying is also easily adaptable to close row spacing and solid block

plantings that are difficult to spray with ground equipment.

A disadvantage of aerial spraying, Potter admits, is the inability to control fungicide drift that may endanger humans, livestock and nearby crops. Better trained pilots, improvements in spraying equipment and better chemical formulations are helping to solve these problems, he concludes.

Use Hot Bath Method to Kill Nematodes

A good, hot bath will free shipment of Bermuda grass turf from at least 3 types of nematodes, according to USDA scientists.

Nematodes cause considerable damage to turf and can be spread to many locations through turf shipments unless certain precautions are taken.

Test results indicate that cores of sod (1" x 3") should be held in water at 122° F. to greatly reduce—but not completely wipe out—nematodes in turf shipments. The most favorable time-and-temperature combination is 15 minutes at 130° F. This treatment kills all nematodes but causes no damage to the turf.

When sod cores are held for 15 minutes at 140° F., both nematodes and grass are killed, so caution must be taken.

Personnel Changes

(from page 36)

staff as Trona Chemicals sales representatives. They are William J. Crummer, Cleveland, O., sales office; and Douglas H. Downing, Shreveport, La., office.

Rain Bird Sprinkler Mfg. Corp., Glendora, Calif., reports Ed Shoemaker has been selected as sales manager of its new marketing division, Eastern Rain Bird Sales, Inc., Peoria, Ill.

Trimmings

We need competition. That's the thinking of Jim Ousley, Sr., who heads up one of the country's top sod producing companies. During an enjoyable visit with Jim this past month at Pompano Beach, Fla., he stated that competitive bidding on some varieties stimulates sales. Ousley faces all the problems of fellow sod growers including labor supply and high costs, plus some which are uniquely Floridian. Among these latter are expensive chemical treatments for chinch bug and billbug control.

* * *

Air-Boats Vs. Jets. A bigger thrill than the usual jet plane flight is that first, wild ride in, on, or about an air-boat. It's something different as I found out while picking up this month's cover picture in Florida's Everglades west of Ft. Lauderdale. C. Elroy Timmer, technician for ARS, USDA, was my pilot during a tour to see test spraying on water hyacinths at the Loxahatchee research area at Delray Beach, Fla. The boat sways, dips, and literally flies over the water and swamp vegetation. Besides producing a thrilling ride, it's also the only practical way to travel Everglades country.

* * *

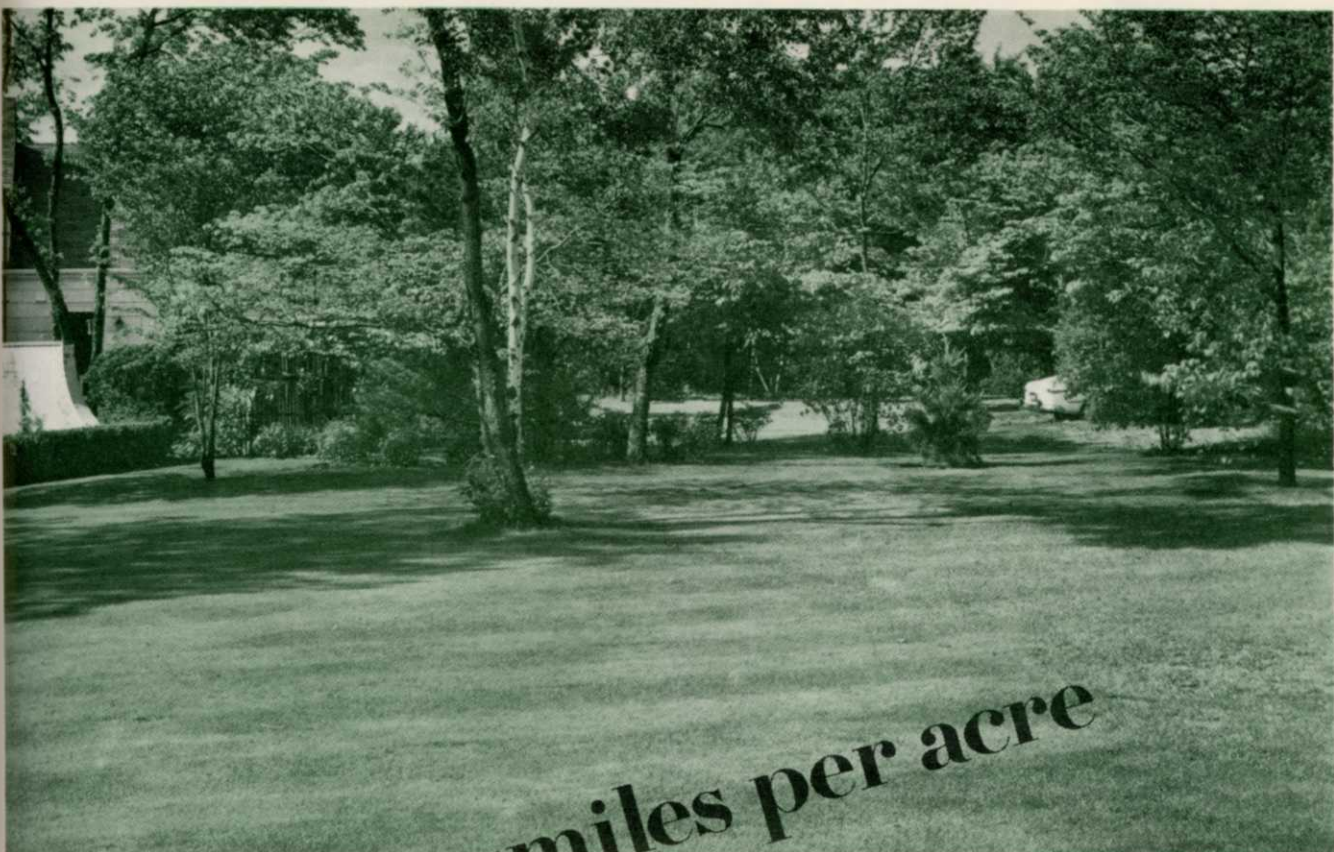
Membership Goal For ASPA. Sod producers are joining their new national association at a record rate. Latest word is that 101 are dues payers. Goal for the group according to Executive Secretary George Hammond at Columbus, O., is 150 by their July 30 meeting at Purdue, and 200 by the January '69 annual meeting.

* * *

Uncle's Dirty Laundry. *Plaudits to the California Association of Nurserymen and their stand against tax-supported plant production nurseries. Research, yes, but production for competitive sales, no! The association recognizes the need for public nurseries as holding yards, but as far back as 1965 passed a resolution calling for a 10-year phase out of local, county, and state tax-supported nurseries. A number have been closed since then but progress is not what it should be. The California group has again voiced its opposition and re-affirmed its stand.*

* * *

Northwest Association Spraymen Active. Had a nice visit with James Overton, of Miller Products and the Northwest Spraymen's Association, Portland, Ore. Jim reports the association is active and interested in some coordinated reporting with WEEDS TREES AND TURF. We've always enjoyed working with this forward looking group. They are aware of their public image and constantly work to improve the stature of the sprayman.



More smiles per acre

...with complete Velsicol chemical care

Thick, smooth, green-carpet turf—with no beauty-marring blotches and bald spots—makes happier visitors, members and bosses, or better-satisfied customers.

And you turn on more smiles per acre—easier—with advanced Velsicol job-tailored chemicals.

Modern Velsicol chemicals give you

precise, thorough control of almost every troublesome weed, insect or disease.

They're performance-proved—in the laboratory and on toughest turf jobs.

Whatever your turf problem—grounds, parks, golf courses, or sod farm—you

can depend on the big Velsicol family of advanced chemicals for the "right answer."

With more and bigger built-in smiles!

For extra convenience just call your Velsicol

supplier. Ask for Velsicol herbicides, insecticides, fungicides, fumigants—*everything* you need to lick practically any turf enemy! You'll enjoy one order, one shipment, one invoice convenience . . . plus the added assurance of *complete Velsicol care.*



Complete line of quality turf chemicals from

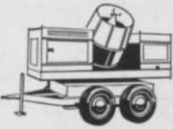
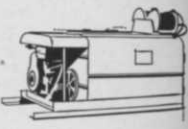




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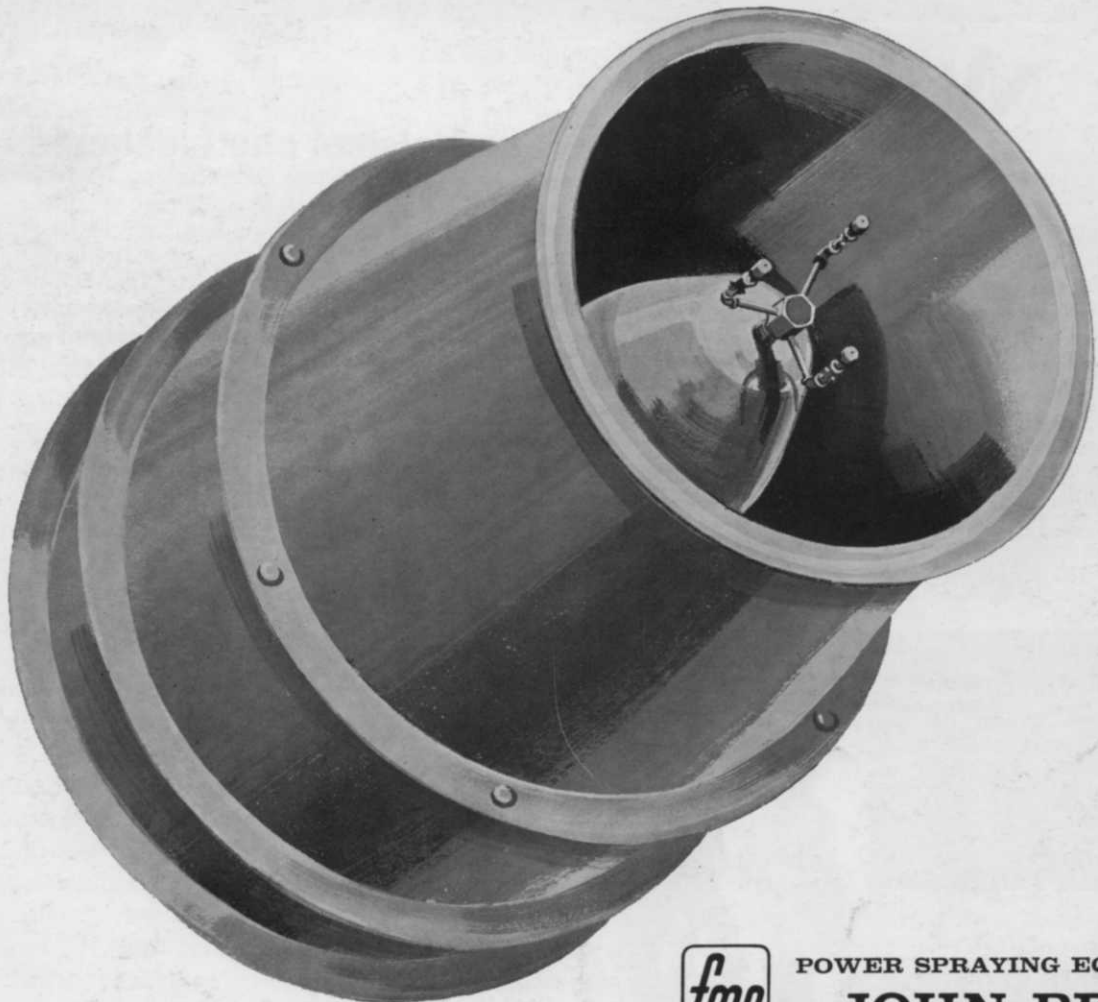


Write for Velsicol Turf Chemicals Catalog:
Velsicol Chemical Corporation, 341 E. Ohio St., Chicago, Ill. 60611. Dept. GM

This Rotomist® sprayer has the greatest "rate-of-work" capacity ever developed for shade tree work. It is a design that provides a *controlled air pattern*, all the way to the top of the tallest trees. This means adequate coverage, as well as more efficient use of your chemicals. It means versatility, because the Rotomist pivots 110° vertically, rotates through 360° horizontally. Which means you can put your spray material—either dilute or concentrate—anywhere you want it. Up in trees. Over an embankment. Down, to windrow leaves. And, of course, John Bean makes many Rotomist models to match your requirements. They all mean business.

 <p>ROTOMIST available in a wide range of capacities.</p>	 <p>ROYALIER SKIDMOUNTED delivers 20 gpm at 400 psi</p>
 <p>MODEL 1010 TURFKEEPER has flotation tires for golf course use.</p>	 <p>ROTOCAST broadcast air sprayer effectively handles all weed-killing programs.</p>

Spray control is straight-through air



POWER SPRAYING EQUIPMENT

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