

NOVEMBER, 1968

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WEEDS TREES and TURF

November 1968
Volume 7, No. 11

FORMERLY WEEDS AND TURF

The Cover

Saving hand labor has proved to be the greatest boon possible to the vegetation care and control industry. Not only is

hand labor not readily available, man-hour costs make the price prohibitive.

Equipment such as the units being demonstrated by Omark Prentice Hydraulics, Inc., Prentice, Wis., build business. These loaders are among the 41 different types available from Omark Prentice alone.

Today, operators determine their specific work loads and then depend on suppliers to practically custom fit their equipment needs. Next month WEEDS TREES AND TURF magazine will feature a business forecast of the industry along with the annual suppliers guide and equipment directory.

Soil and Plant Analysis Explained in Brochures

Harris Laboratories, Inc., has recently announced the availability of two new brochures that explain in laymen's terms the complex process involved in completing a typical soil or plant analysis.

Entitled "The Story of Soil Analysis" and "The Story of Plant Analysis," these 4-page brochures also explain how soil and plant sampling supplies (information sheets, sampling instructions, sample bags and shipping containers) may be obtained without cost.

For your free brochures, write Harris Laboratories, Inc., Box 427, Lincoln, Neb. 68501.

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Assn. For Spraymen

Custom spray applicators need a national association. Seeing the Northwest Spraymen's Association members in action at their annual Spray-O-Rama offered more than adequate evidence of the value of a closely knit organization. This regional group, made up of pesticide applicators in Washington and Oregon (see their report beginning on page 19, have done a remarkable job in promoting both their own private businesses and their industry. More such associations are needed, both state and regional, which could then be molded into a national organization, with a far greater chance of success than the earlier attempt which aborted some two years ago.

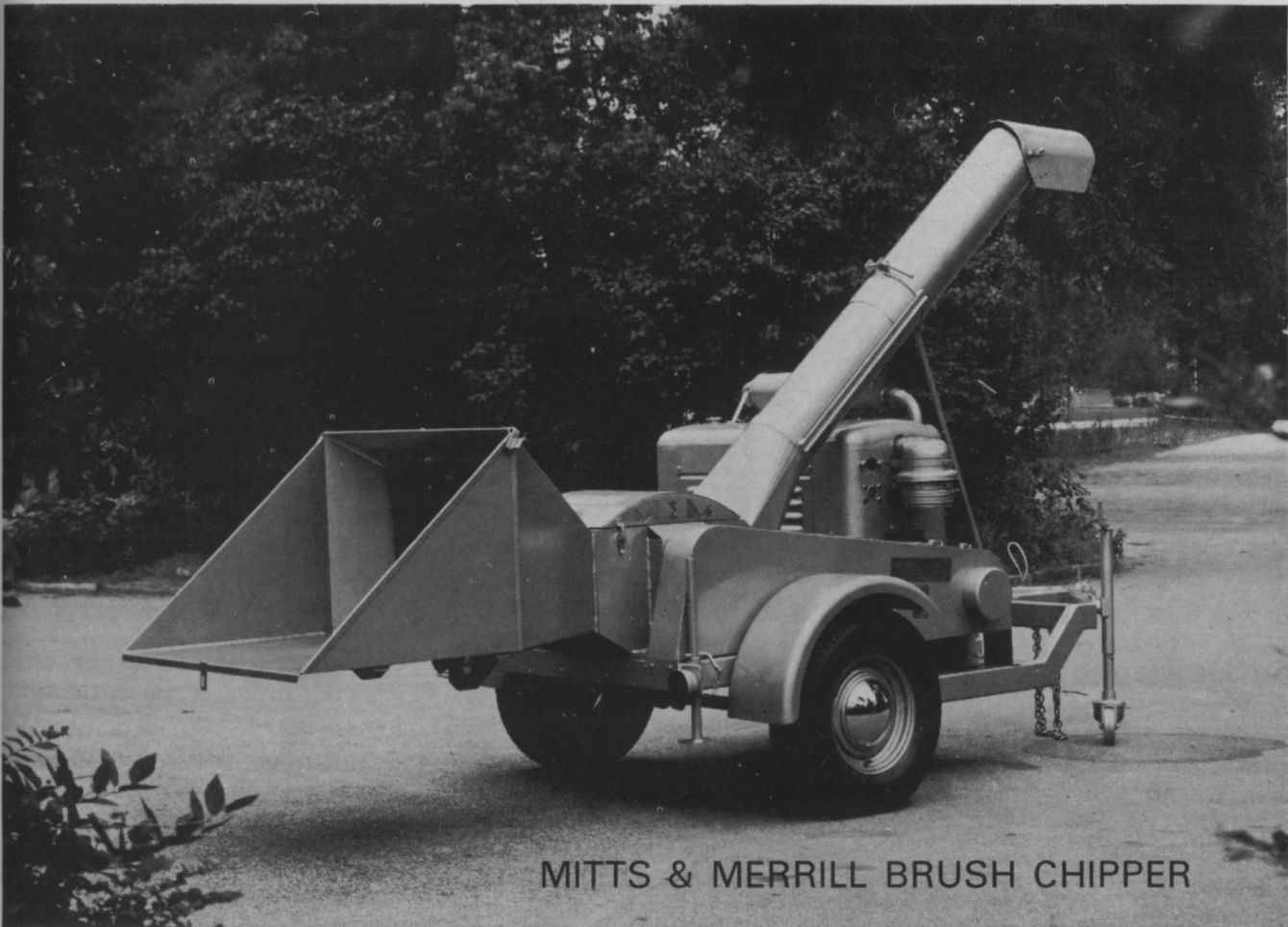
Pesticide application by custom spraymen is big business. But it is an industry generally viewed with skepticism by the average citizen. Seldom has a group done as much for the welfare of the nation as has the chemical industry—from basic producer to applicator. Insects, diseases, and weeds have been controlled, not just for beauty but to make the nation more liveable and to increase the production of quality, low-cost food.

Yet to a great segment of the public, spraymen run a questionable business. Pesticide applicators need a public relations program to tell their story nationally. They need an informative legislative program which will continuously guard their interests and at the same time serve the citizenry. They need up-to-the-minute data on new research, new chemicals, and new equipment and methods for keeping their businesses efficient.

These needs are extensive. They constitute problem areas which cannot be solved over a short period. Rather, they evolve into longtime goals. And these are goals which can be achieved only by association on a national level.

Besides these major goals, the individual who belongs to an organization gains by association with a group, by becoming an integral part of an industry, and by being recognized as the operator of a business with national affiliation. It's a phase of image building which demands high standards and quality service. The N. W. Spraymen's Association is a prime example.

WEEDS TREES AND TURF is the national monthly magazine of urban/industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, sod growers, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled.



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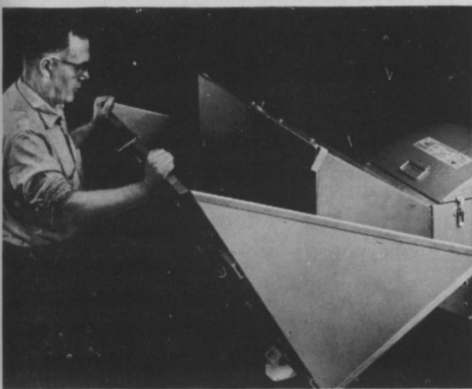
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Visko-Rhap Clears Aquatics From

Adams Bayou

THE "Greater Orange Area" of Southeast Texas, a community of some 40,000 lies near the Gulf Coast. The Sabine River divides its three adjoining cities, Orange, West Orange, and Pinehurst, from neighboring Louisiana. Until recently, these cities had a problem similar to that of many other southern communities. Local waterways were choked with alligatorweed.

Adams Bayou winds for several miles through the three cities. It is a picturesque body of water with great recreational and scenic potential. Marring its beauty, however, has been the prolific growth of alligatorweed. Alligatorweed (so named because growth becomes so dense it "can support the weight of an alligator") had also invaded the many lateral ditches dug years ago to drain this bayou.

Alligatorweed (*Alternanthera philoxeroides*) is a coarse, many branched plant that forms dense mats in shallow water and on mud flats. Broken-off branches root easily and spread rapidly. It has become a pest aquatic weed in coastal areas from Texas to North Carolina, and has been reported as far as 150 miles inland. Alligatorweed is widely distributed in Central America and South America. It is most difficult to control where it is

growing in water, or in floating mats.

Numerous methods of control in Adams Bayou had been attempted for many years, and abandoned. No known herbicide had been effective. During periods of heavy rainfall, draglines were used as a desperation measure at bridges and other key points. Masses of weeds were hauled out of the Bayou and loaded into dump trucks. Though this usually averted serious flooding of the city, it was an expensive and temporary measure. Masses of weeds from upstream often broke loose and drifted down to the bridges and vigorous growth of the weed caused it to be reestablished quickly in other cleared areas.

Test Spraying

Early in 1967, Harold P. Snow, a technical agricultural chemicals representative working out of the Dallas office of Hercules Incorporated, called on Edward L. Shannon, Manager of the Orange County Drainage District. This district is a county wide agency with jurisdiction over an extensive in-county flood protection system including natural water courses within the boundaries of incorporated areas. Snow proposed that Hercules do test



The Alligator weed which is "choking" the stream in the top illustration also covered Adams Bayou, near Orange, Texas. Now, as shown in the center and bottom illustrations, thanks to the use of a new herbicide formulation called "Visko-Rhap" made by Hercules Incorporated, residents near Orange are enjoying boating and fishing on the bayou for the first time in years.

spraying of alligatorweed with his company's Visko-Rhap herbicide formulations. Visko-Rhap is so constituted that it can deliver a carefully regulated dosage of herbicide of a thick consistency that resists washoff or evaporation. Visko-Rhap herbicides also have an advantage over conventional weedkillers as the oily droplets stick and penetrate leaf surfaces more effectively.

Shannon agreed to a trial demonstration using Visko-Rhap. He was impressed with the freedom from drift the formulations possessed. Snow agreed that drift could not be tolerated on a target area which bordered on residential lots and other sites where valuable ornamental trees and shrubs could be damaged. He secured the services of a custom applicator who had a reputation for careful, responsible work. In March and April test plots were sprayed with a variety of Visko-Rhap herbicides.

Results of the treatment were quickly apparent. Shannon convinced city and county authorities that Hercules should be given an opportunity to show what its product could do on a larger scale.

Large Scale Treatment

In June and July of 1967, Snow, working with custom applicator Carl H. Flippin of Flippin Helicopter Service, Beaumont, Texas, sprayed a great expanse of Adams Bayou with the Visko-Rhap formulations that had showed most promise on the test plots. Flippin, a former Army helicopter pilot with service in Korea and Vietnam, and a skilled custom applicator, made the first treatment by helicopter. Six weeks later the center of Adams Bayou was open wide enough for use of a boat, and spraying of vegetation along the banks was accomplished with this type equipment. The results were better than either Flippin or Snow had hoped for. "Growth at that time was about two and a

half feet high, and the weed was in bloom," Snow said. "For best results we recommend application before growth is so far advanced."

To the citizens of Orange the results of the project were spectacular. Arthur La Bleu, a longtime resident on the Bayou said, "I can't remember when the Bayou wasn't covered with 'gatorweed . . . summer or winter. It got so thick I've seen nutria rats walking across from bank to bank . . . and they grow mighty big!"

In early 1968 Shannon and his colleagues were ready with a battle plan. Snow and Flippin were on the job in May, spraying Adams Bayou and some of the lateral drainage ditches with Visko-Rhap by boat. Banks were given careful attention, for alligatorweed will grow outward from the bank, or will root in shallows less than four feet in depth, preferring the brackish water that is so prevalent throughout the Gulf region.

With the cooperation of the local press, residents were advised in advance when spraying would be done. J. Cullen Browning, editor of *The Orange Leader* pointed out that the improvement in Adams Bayou was of substantial economic benefit to Orange and Orange County because flooding that very well could have occurred during the wet spring of 1968 would have probably caused serious financial loss, and even have presented a health hazard to the area.

Economic Benefits

Aside from such speculation, the Visko-Rhap project has been of more immediate economic benefit. Drainage District Manager Shannon stated that the entire herbicide spraying bill for 1968 was \$1400 for treating 30 acres of Adams Bayou (actual cost of the herbicide alone was only \$14.32 per acre). "In previous years it would cost us at least \$500 a day to clean out only

the most strategic flooding spots, employing a dragline, crew, and dump trucks. To use such emergency measures would take from a week to 10 days each time."

Adams Bayou is now becoming a scenic asset to Orange. And many of the citizens are realizing some unexpected benefits. For example, there is a lot less scratching going on. Each spring the broods of a particularly annoying species of spring mosquito, *Mansonia perturbans*, would hatch in Adams Bayou. Unlike most mosquitoes, *Mansonia* larvae do not have to be under water to survive. Larvae of the *Mansonia* attach themselves to roots and stems of aquatic plants where they can develop into welt-producing adults.

J. G. Foyle, Director of the Orange County Mosquito Control District, greeted the alligatorweed control program enthusiastically, "With *Mansonia* sheltered by alligatorweed, larvicides were ineffective," he said. "Furthermore, larvae were protected by the weed, and almost immune to feeding by fish."

With alligatorweed out of the way at last, Foyle could wage war against *Mansonia*. "Since alligatorweed has been cleared out, we have not observed a single flight of *Mansonia*," he reported.

"And very few specimens have been collected in light traps in the area of treatment."

Things are looking up elsewhere in this port city. Mrs. Charlie J. Hall, who with her husband, operates Hall's Marina, pointed across the water to stalls filled with boats. "Before they sprayed with the weedkillers, that was grown solid with alligatorweed, and stalls were empty. Our store traffic is a lot better too, now that boats can come in closer."

Down the road from Hall's Marina is the Orange Boating Club. A year ago the docks were festooned with alligatorweed. Now the visitor can look across a clear expanse of water.

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EFFECTIVE PLANT PROCUREMENT

By Theodore J. Haskell

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



An example of procurement by salvage is this 50-year-old quince transplanted from a sewer construction area.

JUST AS there is more than one way to "skin a cat," so there are a number of ways to "procure a plant." There are at least five practical ways for a man to obtain trees, shrubs, turf, flowers, and bulbs. This article will stress procurement of trees and shrubs, but the methods and procedures can be used with modification for all types of growing things used in our planting programs.

Before we can enjoy the trees of a new park or on the streets of a new subdivision, they must be planted. Before they can be planted they must be procured. The whole process must be integrated into the departmental operations so that the trees, the shovels, the men, the trucks, and the planting orders are ready on the morning of the same day.

We find that the same basic

management skills must be applied to plant procurement as to any other operation: setting the objective, planning, operating, and control and evaluation for next time. We should improve each cycle as we analyze our results and feedback.

Objectives:

In Lansing, our objective, of course, is to obtain adequate plant materials for landscaping our parks, golf courses, cemeteries, and for street tree plantings. Some of the trees, shrubs, and other plants are for new construction and development, and some are for replacement and redevelopment of established areas. Whatever your situation may be, the first step in effective plant procurement is to set and define your objective.

Only then can you begin planning an accurate picture of your needs. These will include the immediate needs and the projected needs evolving from long-range planning for our changing situations.

Planning:

Planning must begin well in advance. Optimum planting seasons are limited (in the Midwest) to spring and fall. We must plan months in advance. This is the minimum. Long-range planning several years in advance would be better yet. Many cities prepare capital development programs to allocate priorities to various development programs. If trees are involved for new streets or around public buildings, it is your job as city forester, arborist, landscape architect, etc. to see that the costs

of the plant materials are considered in the planning.

Three major factors in planning such programs are (1) numbers, (2) size, (3) selection of species. The numbers of trees and shrubs are usually obtained as part of the design process and are usually determined by the results desired at maturity. The size of the materials determines how soon you will achieve the effect visualized by the designer. Use of larger plants is more expensive, but in effect allows us to "buy time." Considering the growth of an average shade tree we can gain perhaps 4-6 years per inch of additional trunk diameter. The selection of species should not be based on what is available, or what is cheap, but on the effects of texture, color, and form that we need for the situation. These functions must be correlated with existing site factors if we are to make the proper decision as to the optimum species. All too often these "optimum species" are not readily available on the current market. However, planning future needs and close cooperation with enlightened nurserymen can do much to improve our chances of purchasing the necessary plant materials in the numbers, sizes, and species that we need.

Planning also involves the training and equipping of skilled employees to carry out the plans. Without skilled men and specialized machines we are unable to take advantage of the rapidly changing demands and opportunities that are part of today's operations.

Operations:

In procuring plants for our planting operations we must strive to be effective, that is, we must strive to get the right things done. We cannot depend on any one method. While the most common method of procurement is by purchase from commercial nurseries, there are

at least 4 others: collecting, swapping, salvaging, and growing your own. (See Table I for comparisons.)

Collecting, swapping and salvaging are the least used today, but often are the only way of obtaining rare or unusual plant materials. Formal gardens, botanical gardens, arboreta, and restricted street situations often require materials that are "out of style," or "out of stock," or "unobtainable in large sizes." For example, nearly twenty years ago we started using the hophornbeam (*Ostrya virginiana*) as a medium-class street tree for narrow parkways, short spaces and under powerlines. The farm woodlots were our only source of supply. Collected at $\frac{3}{4}$ "-1" diameter, this sprangling understory tree developed in the nursery and later on the street to a soft textured cone shape that functioned very well for the special situations described above. It also makes a good replacement for elms and many residents cannot tell the difference. Yet this excellent tree is still not widely available.

While swapping and salvaging of plant materials may be done in small sized material in various quantities, it is usually not worth the trouble unless we are dealing with exceptional specimens. These may be moved in any size that tree-moving equipment can handle. Transplanting small numbers of individuals usually runs the labor costs sky-high. However, if a department has the skilled men and the modern tree moving equipment, the upheaval of old gardens and large homes by highway construction, urban renewal or other "progress" may offer exceptional opportunities to salvage valuable trees and ornamentals.

A number of years ago a sewage pumping station and large forcemain had to be constructed in one of our riverside parks. A fine old ornamental quince tree was in the way. During the winter before construction we carefully dug and successfully moved the tree with the frozen-ball method. Today its gnarled trunk and twisted branches add just the right

In Brief:

Effective plant procurement is an important link in the operation of a park, cemetery, golf course, street tree planting, or any operation involving public grounds. It depends on the basic management cycle involving objectives, planning, operations, and control. Once the needs are determined through planning we may acquire the plants in five ways: collecting, swapping, salvaging, purchasing, and growing your own.

The majority of the plants will be purchased or grown and the decisions of what to purchase and how much to grow will be based on a combination of economic and public service factors. With the growing shortage of plant materials especially shade and ornamental trees, more consideration is being given to long term contracts based on careful projections of need for specific kinds of plant materials. All phases of the procurement process should be evaluated to see how well the objectives were met and to help forestall mistakes during the next cycle.

As we have more precision in planning, more ingenuity in collecting, swapping and salvaging, more cooperation between growers and buyers, and learn more from our mistakes—then we will have more and more effective procurement of plant materials. T. H.

touch to the rugged exterior of our Nature Science building.

Purchasing:

I know of no department that does not purchase at least a portion of their plant materials. Even those departments operating their own nurseries will often purchase lining out stock and "whips" for growing-on and as many suitably grown planting sized materials as funds permit. The cost-benefit factors of operating one or more departmental nurseries are too complex for full discussion, but to understand a bit more we must first look at the advantages of direct purchasing.

A city department that is just getting into planting street trees or is developing only a few parks or public buildings may well contract the whole operation. In this sense they contract for the skill of the propagators and nurserymen and need only supply an inspector to see that the specifications are followed.

A more fully developed program may purchase trees and shrubs in planting sizes. In this case the department avoids the investment in land and nursery facilities and will only supply the labor for the planting crews trained and supervised by a city forester, arborist, landscape architect, or horticulturalist.

Tree purchase by government agencies is usually defined and limited in scope by policies, ordinances, and statutes regarding contract purchases. Learn the framework under which you must operate and get to know the men in key positions. Care in these planning stages saves time and confusion. A day saved for the planting seasons is a day well earned.

Contracts:

Contract procedures include preparation of specifications and standards, preparation of a time schedule, inspection of the stock,

and certification of performance.

Specifications may vary from a single page to cover the purchase of a few trees to a multi-page document for the planting requirements of a large city. The complexity of the specifications will increase in proportion to the size of the job since the inclusion of some classes of detail usually requires all classes to be covered in similar detail. Whether a set of specifications is large or small it must perform two functions: (1) with the contract it is a binding document on the parties concerned; and (2) it gives instruction and information to assist and advise toward the proper completion of the contract. A checklist should include:

- a. Scope of project
- b. Definition of terms, detail on materials, supplies, and equipment (if required).
- c. Detail of operations, time schedule and methods.
- d. Special cases and exceptions.

Use of a standard contract form and procedure simplifies bidding and tabulating. We have found that it works best to use scientific names for precision in dealing with the nurserymen, but arrange the items in lots alphabetically and by size class to aid the purchasing agent. Each lot is given a number and the bids are made on a lot basis. A purchasing agent usually finds it easier to refer "lot 14" or "lot 42" than to "150 *Platanus acerfolia* 1¾"-2" or to "20 *Kaelreuteria paniculata* 1¼"-1½". "

In addition to the time schedule for delivery included in the specifications a master time schedule should be prepared covering the preparation of lists, advertising of bids, bidding, approval of best bids by the council or manager, delivery and inspections of the plant materials. Such a schedule serves as a basis for control of progress and is used to check feed-back of reports from inside and outside the de-

partment. Copies should go to the purchasing agent and the field men who will receive and inspect the trees.

Inspection of stock as it is delivered is essential to see that you actually have the numbers, sizes, and species needed to carry out your plan. Your men should use calipers or plywood gauges to check sizes and at the same time inspect for broken roots, dried out roots, inadequate ball size, etc. These conditions or other deviations from the specifications should be noted at the time so that corrective action may be taken. Only in this way can you be sure that you will get what you pay for.

Long Term Contracting:

Emphasis on beautification of growing subdivisions, new highways, urban malls, and other public areas has created a serious shortage of suitable plant materials. This shortage is forcing changes in old methods. One of the most promising changes that is developing is long term contracting. Instead of negotiating 2 purchase contracts each year some departments and nurserymen have developed a system of long-term contracts of, say, 3000 trees of certain basic species per year for the next 5 years.

Harold Hicks, of Cottage Garden Nurseries, Lansing, Michigan, is one of these pioneers. He recently spoke of the need for planning to the Michigan Forestry and Park Association. "If you want to buy a 2"-2½" tree today it should have been born at least ten years ago! The big reserves are gone! Kansas City orders 10,000, Milwaukee orders 11,000 and where are they going to come from?" He advocated departmental planning with at least 10-year projections. These could provide guidelines to the nurserymen. He also recommended earlier requests for quotations, not just a few months earlier, but at least a year. He

Table I Plant Procurement

Methods	Collecting	Swapping	Salvaging	Purchase from commercial nurseries	Grow your own
Source	Farm woodlots, departmental lands	Friends and associates in other departments, in arboreta, colleges etc.	Highway construction, urban renewal, old gardens, dept. construction projects	Commercial growers and suppliers	Collect seedlings. Propagate from seeds & cuttings, buy lining out stock
Optimum size	Usually small seedling stock up to 2" diameter.	Usually in the larger specimen sizes, but can include almost any size that tree-moving equipment can handle	Ordinarily specimen trees only. Rare species or habit. If root pruned may go to the largest B&B sizes ³	All sizes from lining out stock to balled and burlapped specimen trees	1½"-2" dia. for street trees. Larger sizes for special sites
Bare root ¹					
Balled and burlapped ²	Unless previously root pruned, losses will be higher in larger sizes ³				
Unit cost of labor and equipment	High	Variable: depends on the distance to be moved	High	Low: men needed only during the planting season	Moderate: if equipment and trained men are available
Unit cost of plant material	Low	Low	Relatively low: but hard to figure except by cost comparison	High	Low
Inspection by state	Paid by buyer or owner	Paid by either party	Paid by buyer	Paid by grower	Paid by department annual inspection
Advantages	Often the only way to obtain rare, or exotic plant materials not in mass demand			Low investment in land, inventory. Labor need not be as highly skilled. Men needed only for planting	Insures that material will be available when needed. Develops trained plantsmen
Disadvantages	Plant materials must usually be held in own nursery for a season or two. Losses from transplant shock may be high	Time of the year is critical. Costs may run high if not in dormant season or if distance is great	Time of the year is critical. Costs will run high if not in dormant season or if the distance to be moved is great	Must plant all the current order. Hard to get material in size, species, habit that you may need. Does not develop trained men	High investment in land, and inventory. Labor costs may be higher on a unit basis

(1) Bare root: Deciduous and evergreen seedlings; deciduous trees (most species) up to 2½" diameter
 (2) Balled and burlapped: All evergreens bigger than seedlings, certain sensitive deciduous trees 1" diameter up to 6"-8"; deciduous trees from 2" diameter up to 6"-8"
 (3) Collected material will require a ball at least ½ larger than root pruned stock transplanted from nurseries

cited the 5-year contracts developed by Warren, Livonia, and Flint, Michigan. By removing much of the guess work and need for speculation such planning can insure sufficient quantities, better quality and lower prices.

Arthur C. Drysdale of Sheridan Nurseries Ltd., Etobicoke, Ontario, speaking at the 1968 Great Lakes Park Training Institute, further emphasized the benefits that can be realized through closer cooperation between the nurserymen and the departments. Better understand-

ing of standards and special terminology, and better appreciation of the types and sizes of plant materials needed will come of such cooperation. Canadian growers have recently completed *Guide Specifications of Nursery Stock*, and I understand that *American Standards for Nursery Stock* is in the process of revision. Such improved communication must be encouraged and cannot help but improve the coordination of supply and demand. Research on better selections for improved shape, habit and resistance to insect pests and

plant diseases is increasing the quality, but as yet the quantities have not kept up with the increased demands.

Growing Your Own:

Most larger departments maintain a "nursery" of some sort. This may vary from the large establishments like those of Detroit, Milwaukee, and Kansas City where skilled propagators begin the complete growing cycle, to modest nurseries devoted to "growing on" of liners and whips, to those "holding

stations" where surplus trees and shrubs are heeled in over the summer or set out for a few years until needed.

To determine the best balance between straight purchase and operating a nursery one must first obtain a realistic cost picture. When the department operations are reduced to unit costs (i.e. bedding plants @\$.10, flowering shrubs @\$.25, shade trees @\$3.00) then you can compare the departmental operations with contract purchases and have a sound economic basis for a decision.

Volume is a key factor in the decision whether to propagate or just operate a "growing on" nursery. Labor costs for skilled propagators are high (if they can be found at all) and unless they can be used to full capacity it is better to buy lining out stock. Dr. John Baumgardt suggests that purchases in units of 250-1000 plants will reduce the need for special propagating houses and skilled plantmen. He gives as a guideline "a site big enough to hold approximately 2% of the plant materials maintained by the department (trees, shrubs, and evergreens)." He adds that you should plan for 2 permanent skilled men for each 5 acres. Extra men can be sent in for digging during the planting season.

Robert L. Corbin, horticulturist for the London County Council (England) maintains traditional British standards in grounds maintenance for 250,000 public housing units serving nearly 1 million people in the London area. He maintains 13 nurseries on the outskirts and two within the metropolitan area. His men plant about 5000 trees a year, buying many at 6'-8' and bringing them on for about 5 years. Mr. Corbin said "If we can purchase in the size and species we need, we do." Though they buy a lot of material from nurseries they rely on their own finished material to

guarantee the maintenance of their landscape designs with prompt replacement of the proper plant materials.

These guidelines have been repeated by a number of North American horticulturalists including Richard Fenicchia, Rochester, N. Y.; Dr. John Baumgardt, Kansas City, Mo.; and R. H. Bishop, London, Ontario. They list a number of factors favoring the operation of departmental nurseries. Decision-making by public officials involves more than pure economics and you will notice that certain advantages are based on quality service to the public:

1. A city must have large numbers of species in relatively small quantities. Planning can guarantee the supply of critical stock if you have your own nursery.
2. A nursery program allows the city to carry on experimental programs and to preserve and perpetuate many plants which might not otherwise be available.
3. The trees can be given special pruning (ex. for street use) several years in advance of planting if desired.
4. Plant materials are on hand and available at any time for special purposes, flower shows, conventions etc.
5. The time lapse between digging and planting can be materially reduced.
6. Over a period of time a nursery operation assures that the department has capable, well trained plantmen available for special landscaping or other critical planting jobs.

While there are many advantages it must be remembered that such facilities and staff represent a heavy investment in land time and money. City labor costs may be higher (due to fringe benefits in particular) than those of the commercial

nurseryman. Unless the higher costs can be offset by greater, or more effective service to the public, the department might better place emphasis on purchase by contract.

Control and Evaluation:

Whichever methods are used to work toward the objectives of plant procurement we must provide for control and evaluation. This is the final step of the management cycle and involves the measurement and correction of the performance of those in the operation. We compare the results with the plans and make corrections for the next time. In effect, we *plan for control and control for the next plan.*

1. Set the standards and determine what deviations will be allowed. We do not require that all the columnar maples be exactly 2" diameter, but that they measure between 1 $\frac{3}{4}$ " and 2" when measured six inches above the ground.
2. Determine precedence, what things logically come before other things. For example: Inspect nursery, compile inventory, order trees, write planting orders, write digging orders etc.
3. Establish estimated time requirement for each activity. Establish deadlines and work back.
4. Watch the feedback of periodic reports during the operation to detect critical deviations from the plans.
5. Hold an operations critique and discuss the problems and solutions with the men concerned. Often an emergency decision may be a decided improvement and should be continued. Avoid the attitude "if only we had done thus-and-so" and concentrate on the more positive "next time we will do it this way."



Sevin insecticide is pumped from army tank truck to waiting Air Force C-123 transport plane for spraying. Plane covers 500-foot swath.

Gigantic Spray Campaign Stymies

Gypsy Moth Tree Damage

DEFOLIATION of trees by gypsy moth has long been a problem in the northeastern US. Trees are seldom killed immediately, but leaf out the following year. However, many weaker trees eventually perish, especially if they suffer a second year of infestation.

To fight the moth, New York State has long had an extensive program of egg mass counts followed by spraying of the areas of heaviest infestation. A count of more than 500 egg clusters per acre marks an area as a prime target for spraying.

This was the case this past season when the State via its Bureau of Forest Pest Control cooperated with the US Military Academy and the US Air Force to spray 11,000 acres of New York's Hudson River Valley.

Army authorities were con-

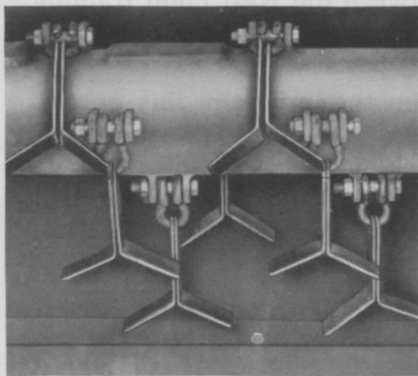
cerned about West Point land because it is extensively used for training and foliage is necessary. Also, despite quarantine and inspection procedures, gypsy moth infestations could be transported by military vehicles which range between the West Point training reservation and southern military posts.

In the program this spring, parts of Long Island, Ulster, Rockland, Orange, and Dutchess counties, and Bear Mountain State Park were sprayed in addition to the big acreage at West Point. Spraying was done with a variety of equipment. Included were the New York State jet-powered "Huey" helicopter, four custom operated fixed wing aircraft, two Air Force C-123 transports, and several ground application rigs. The ground equipment was used for close-in work



Trees without leaves were photographed in July. Damage was caused by severe gypsy moth caterpillar feeding. Spray program of New York State and military group prevented widespread damage this season.

**ASK ABOUT OUR
WORTH-MORE FEATURES**



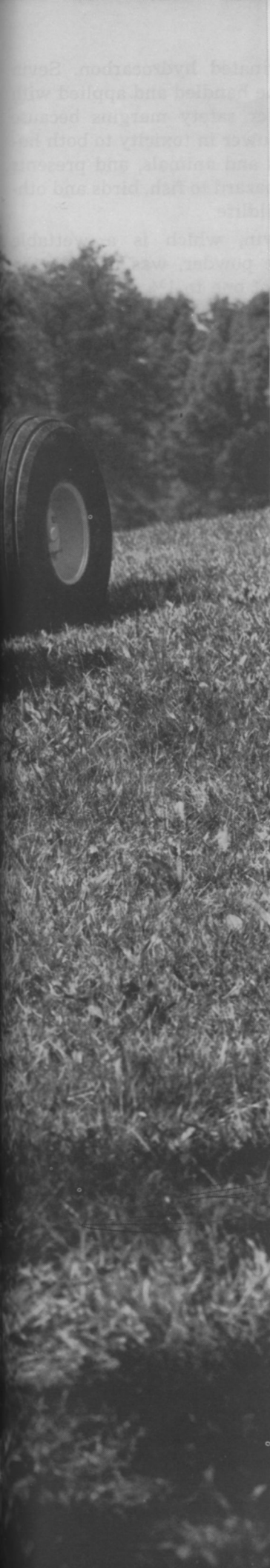
Reversible, double-edge knives

Reverse them to double their life. Knives can be resharpened individually. Does a better mowing job than a cutterbar mower even with dull knives. Cutting height is adjustable from $\frac{3}{4}$ to 5 inches.



Heavy rubber safety curtain

So safe with thrown debris that many purchasing agents insist on a flail-type mower. And you get the aggressive cutting action of a rotary cutter with the safety of a reel mower.



Quiet. Safe. Thrifty. What a mowing team!

New International 2444 tractor and 70 flail mower.

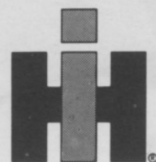
Quiet tractor. New 2444 shushes along. Won't bother the operator or others. **Quiet mower.** No noisy, vibrating housing. It's contour-formed to the heavy frame. Then continuous bead-welded to the frame to *last*.

Safe tractor. New 2444 has great sidehill stability. A low center of gravity. A low profile. Big, wide grass tires. A differential lock reduces wheel spin, turf gouging, tractor drifting. 8.5-foot turning radius with 70-inch wheelbase and easy hydrostatic power steering. **Safe flail mower.** Knife action throws debris straight to the ground, not out. Rugged rubber (not canvas) safety shield—won't rot, rip, shred. For added safety, the universal joint is shielded.

Thrifty team! Choose your transmission. Standard hi-lo with 8 speeds forward, 2 reverse. Or optional 8 and 8. And save on mower maintenance. One man can change any flail blade individually without removing every knife in the row. See your dealer for additional worth-more features and an International 2444 tractor demonstration—with a 5 or 7-foot 70 flail mower. His finance plan can help you write this new equipment into the budget.

INDUSTRIAL EQUIPMENT

Wheel and crawler tractors • loaders • backhoes
dozers • forklifts • mowers • special duty tools



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Spray nozzles on helicopter spray rig are cleaned and adjusted prior to loading with insecticide.

near buildings and pond water areas.

Pilots and military planes were part of the Special Aerial Spray Flight unit of the Air Force. They are headquartered at Langley Air Force Base, Va., but all spray work in the Hudson River Valley operation was done from Stewart Air Force Base. All Air Force pilots were veterans of the defoliation spray program in Vietnam.

Prior to this year, DDT and Sevin carbaryl insecticides have been used. And until four years ago, DDT was used in remote areas where there was no danger of water or pasture contamination. However, DDT use was abandoned in favor of the newer Sevin insecticide.

The switch to Sevin was made because as a carbamate, Sevin is an entirely different chemical family than DDT which is a

chlorinated hydrocarbon. Sevin can be handled and applied with greater safety margins because it is lower in toxicity to both humans and animals, and presents less hazard to fish, birds and other wildlife.

Sevin, which is a wettable white powder, was used at the rate of one to 1¼ pounds of actual insecticide in one gallon of water per acre. Pinolene, a pine-oil based material, was used as a spreader-sticker. Generally, the New York State spray programs are conducted between May 15 and June 15 each year. At this time caterpillars are young and easier to kill. Also, foliage is almost fully developed and has sufficient leaf surface area to catch the sprayed insecticide.

Practically any type tree is subject to gypsy moth infestation. Certain species such as oaks, willows, larch, linden, poplars, speckled alders, basswood, apple, aspen, gray birch, river birch, and red birch are preferred. Less favored by the gyp larvae in their late instar stage are cherry, elm, hickory, chestnut, hornbeam, maple, black birch, paper birch, yellow birch, sassafras, and black gum. However, these are also often attacked by the moth. Older gyp larvae will also eat native eastern pine, spruce, southern white cedar, hemlock, and beech. Gypsy moth infestations can be found in much of New England including parts of New York, Connecticut, New Jersey, Pennsylvania, and Michigan.

Prior to the New York State spraying operation each year, each property owner is contacted. If too many object, a spray campaign is not economically feasible and cannot be carried out. However, publicity and education over a period of years has largely eliminated objections and complaints are few. Citizens generally have come to realize the value of a carefully planned and conducted spray program designed to prevent ravaging of the tree population.

Cardboard check scraps help spraymen keep tab on effectiveness of insecticide coverage. Test here was made during spraying on New York's Bear Mountain.





Lew Seflon



Portland, Ore., was the site of the annual Spray-O-Rama sponsored by the Northwestern Spraymen's Association. Scene shows early arrivals for the Saturday session.

Northwest Spraymen Discuss Association At Portland Annual

A PANEL with 90 years experience in the spray business, discussed the worth of their association at the recent Spray-O-Rama, annual meeting of the Northwest Spraymen's Association, Inc., Portland, Ore.

Panel moderator William Owen, General Spray Service, Clackamas, Ore., led four veteran operators in comparing their business before and after becoming members of a spray association.

"My association keeps me in touch with people who can help solve problems and with people who can get information." This key statement was by Ray F. Collier, Collier Spray Service, Portland, Ore. Collier said members have to work but that they thereby gain in education, and in association with educated and experienced men. A group such as the Northwest Spraymen brings in top speakers, both local and from throughout the country, he said. By joining together, Collier

pointed out, his group helps on legislation to protect members, and to protect the public. Members learn to appreciate their competitors as people and are able to exchange ideas with both local and distant spraymen. Collier said he personally wanted to see the educational program of the association continued. He called for more information on

new materials and equipment. In return for the many association benefits, Collier said that he in turn pays dues, spends time in meetings and on committee work and gives talks to garden clubs and similar groups. He also discusses pesticides on television and radio when asked.

Another pesticide applicator, John Haines, Haines Tree Ser-

Verle Woods, Crop King Chemicals, left, and Chuck Nichols, Nu-Life Fertilizers, discuss products during Spray-O-Rama.





New officers for 1969 for the Northwest Spraymen's Association are, left to right: Stan Raplee, Seattle, Wash., president; Lew Seflon, Portland, Ore., vice-president; and Ken Crane, Edmonds, Wash., secretary-treasurer.

vice, Bellingham, Wash., said he received far more in benefits than many because he lived in a sparsely populated area. The association, he said, gives him the chance to talk with and associate with other spraymen. From others, Haines stated, he finds standards by which to judge his own business. He can freely talk over problems and keep in touch with the industry. Haines depends on

the association for meeting and seminar notices and further, he said, the organization gives an operator satisfaction in being a sprayman. Haines believes his greatest contribution can be help on recruitment of spraymen from smaller towns who are not as yet association members.

Full-Time Business

Owner of the Eastside Spray-

ing & Fogging Service at Kirkland, Wash., John Behey, gave the association full credit for getting him into the business full-time. He not only learned to know his competitors, Behey said, but he developed a high regard for them and the quality of service they rendered. Behey said he found them, through the association, to be very helpful in exchanging ideas on methods and equipment. As he personally grew in the business, Behey became a leader in educational programs to improve the business. He hired an agronomist to teach him and his employees, plus other association members, more about soil testing. Since that time, Behey has developed a full training course for new employees. He offered the group more of his time and stated that he would willingly do anything asked by the association.

An aerial applicator and pilot who operates a fixed-wing aerial spray service, Bill Powell, told the group that he would like to see aerial and ground applicators work more closely together. He said that group action was especially needed regarding legislation. Powell who is not a member of the N. W. Spraymen's Asso-

Panel discussing subject of association benefits is, left to right: Bill Powell, pilot; John Behey, Eastside Spray Service, Seattle, Wash.; John Haines, Haines Tree Service, Bellingham, Wash.; Ray Collier, Collier Spray Service, Portland, Ore.; and panel moderator, William Owen, General Spray Service, Clackamas, Ore.



ciation but is affiliated with the National Aerial Applicators Association proved to be a firm advocate of an association. In the NAAA, he said, the applicators who do not participate as members in association activities are usually the ones who are troubled with drift, materials, requirements, and similar problems.

Technical Information

Technical representatives of suppliers were featured on the educational section of the program. William H. Pierson, Diamond Shamrock Corporation, Portland, Ore., discussed turf weed and disease control. He explained that dacthal W-50 for turf is no longer available but is now supplied as W-75. In response as to why dacthal cannot be supplied as a liquid, Pierson explained that it is possible, but is an expensive and technical process and not economically feasible for the user.

Pierson also cautioned against using dacthal on golf greens because of the high chemical residue common to most greens. This precaution is especially appropos on Toronto or bentgrass greens. Residues build up in greens soils, he said, and addition of dacthal may cause an imbalance.

Systemics are not a panacea for all problems according to Clark Amen, American Cyanamid Co., but they are helpful. Amen proved a popular addition to the program as he listed all major systemics on the market today, and discussed the characteristics of each. Amen emphasized to each sprayman to carefully "read the label," whether using the product for soil or foliar application.

Among advantages of systemics which Amen pointed out are that a systemic can be sprayed on foliage and be expected to stay and it can be used at lower rate because a systemic is highly



Don Miller, A-1 Spray Service, Tacoma, Wash., left, visits with Jerry Mills, Miller Products Co., center, and Roger Hastings, Elanco Products Co., Tacoma, Wash.

active. By placement with the granular form the sprayman can avoid upsetting the balance of nature and killing off helpful predator insects. Also, Amen said, the systemic offers a method of achieving early season control. One application, he said, can give protection for six to seven weeks.

Precautions

Limitations of systemics, Amen said, include the fact that they are very toxic and require extreme care in handling. Also, the systemic does not translocate back toward the trunk of a tree and requires careful application to assure coverage. Systemics can also delay germination of seed unless the chemical is placed at the side of the seed.

By way of summary, Amen said that systemics are a valuable tool, but that this does not mean they are a substitute for other things. He urged spraymen to take the approach of the doctor and carefully consider each problem before determining whether to use a systemic.

An unusual and helpful session on the program was a 4-hour session with a psychiatrist, Dr.

John L. Shirley, of Group Dynamics, Inc., Dallas, Tex. Dr. Shirley tied a discussion of the physiological make-up of the individual with an approach to selling. He urged spraymen to take note of the personality type being dealt with in determining sales approach. This type of program was unique in an annual meeting such as the Spray-O-Rama, but proved to be extremely popular with the group and apparently most helpful. President Jim Overton said that it was planned in response to the policy of the association, the intent of which is to feature educational segments in each annual meeting.

New officers elected for the coming year are: Stan Raplee, Washington Tree Service, Seattle, Wash., president; Lew Seflon, Lew Seflon Spray Co., Portland, Ore., and Kenneth Crane, Turf-spray, Edmonds, Wash., secretary-treasurer.

Outgoing officers who planned the '68 Spray-O-Rama and generally served as hosts were: Jim Overton, Miller Products Co., Portland, Ore., president; Seflon, vice-president; and Charles Seibold, Major Spray Service, Portland, Ore., secretary-treasurer.



Thomson Machinery's newly acquired Overland scraper line offers 1, 1½ and 2-cubic yard capacities. Scrapers with larger capacities will be offered in the near future, according to Thomson.

Thomson Machinery Adds Overland Scrapers to Line

Thomson Machinery Co., Inc., Thibodaux, La., manufacturer of sugar cane field equipment, recently acquired the name, design and manufacturing rights to the Overland scraper from Overland Equipment Co., Inc., Buena Park, Calif.

A subsidiary of Seilon, Inc. of Toledo, Ohio, Thomson announced no major changes are planned immediately on the scraper line. Presently, two models are available in manually operated M-100, M-150 and M-200; and hydraulically operated H-100, H-150, and H-200. Scrapers with 3, 4½ and 6-cubic yard capacities will be available in the near future, Thomson revealed.

Purdue Engineers Evaluate Electric Turf Heating

Electric heating of turf in sports stadiums is now beyond the experimental stage and may be the forerunner of a technique to help feed people, according to Purdue University's J. R. Barrett, Jr. and F. W. Harwood of the agricultural engineering department and W. H. Daniel, turf specialist in the agronomy department.

In describing heating systems

now in use, the Purdue men discussed the objective of the Lambeau Field (home of the Green Bay Packers) installation, which was to prevent the field from freezing, at least until the National Football League play-off game last December. Other hoped-for results included: seeding and sodding cost reduction, faster rejuvenation of damaged turf, reduced injuries, faster drying and some snow melting.

Green Bay's system cost an estimated \$80-\$100 thousand; the heating bill \$10-\$20 thousand, according to the engineers.

In commercial turf heating, a system of cables is buried six or seven inches in the earth, the exact design varying with climatic location, availability and cost of power, extent of and use for each turf area and the grass variety used, they said.

However, shallowly buried cables can cause headaches, they revealed. Groundskeepers must be careful not to puncture the cables, as breaks are difficult and time consuming to locate.

They quoted Green Bay coach Vince Lombardi, who said, "The 'electric blanket' was a very successful operation—we just have to use a different tarp. Moisture forms between the tarp and the turf and freezes—that is what caused the field problems we had for the championship game."

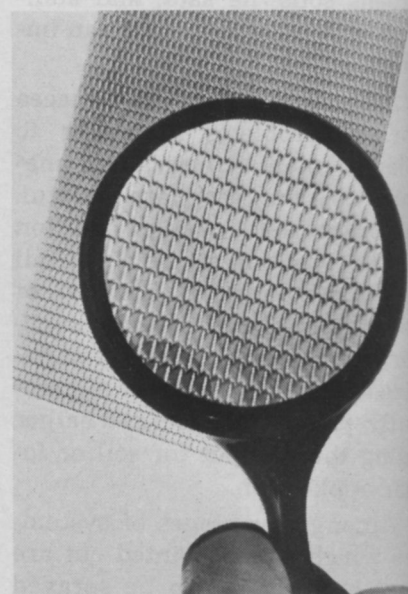
Looking ahead, the Purdue engineers said that electrically heated golf greens are under consideration. Perhaps the modification of temperatures of plant-supporting mediums will some day help grow food, they added.

National-Standard Offers New Pierced-Metal Screen

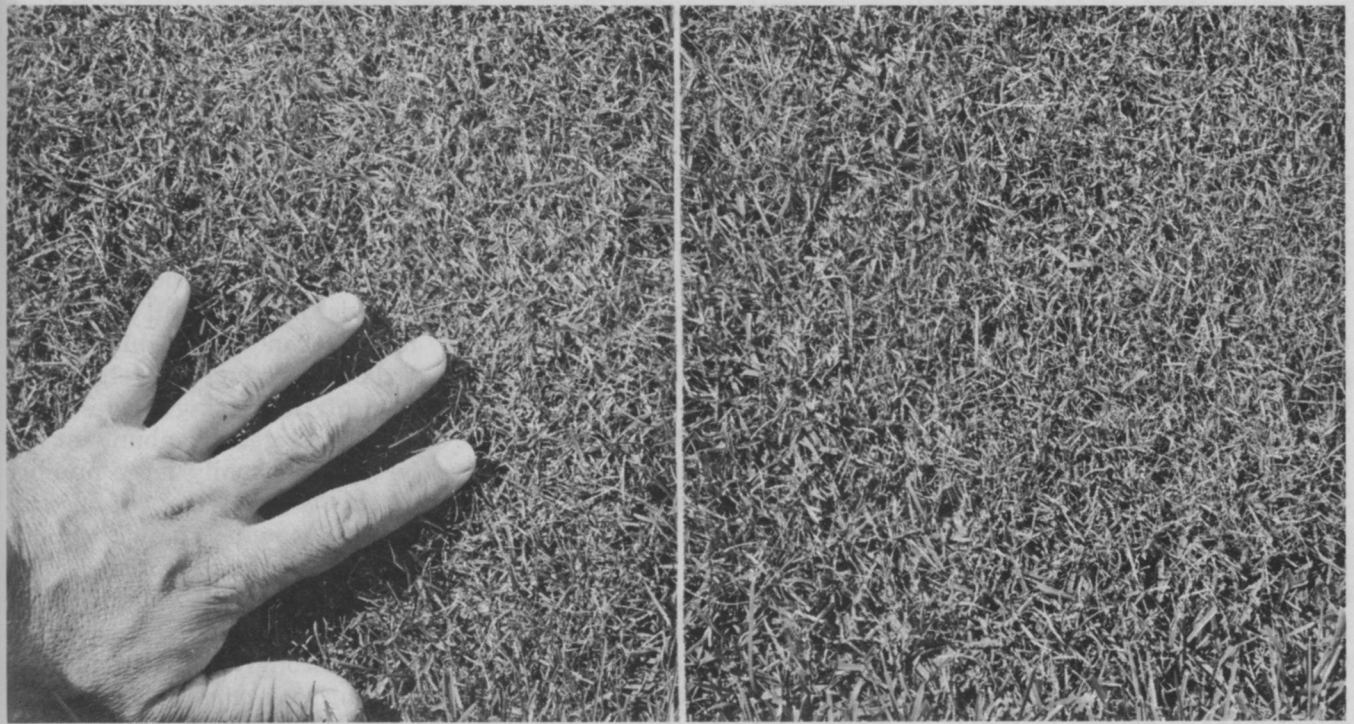
A new design in pierced-metal screens has been introduced by National-Standard Co., Perforated Metals Plant, Carbondale, Pa. Stainless steel Slotted Conidure™ offers long life, improved throughput, increased screening efficiency and reduced clogging for screens in centrifuges, dewatering presses and other dewatering equipment used in chemical and food processing, according to the company.

A unique piercing process insures that slots are highly tapered in the screening direction. By permitting sheet thickness to exceed hole diameter, this technique combines long-screen life with high throughput.

Contact the Carbondale plant for complete details.



New Slotted Conidure™ metal screen provides unique tapering of slots to prevent clogging or binding, according to National-Standard.



Fylking and Highland bentgrass planted side by side and both mowed at one-half inch heights. At this close clipping the 0217 Brand Fylking looks almost as good as the Highland.

Promising for Close-Mowed Luxury Lawns

Fylking and Tifdwarf Bermuda

By Dr. Robert Schery, The Lawn Institute

IN THE UNITED States there are no more esteemed lawn-grasses than the Kentucky bluegrasses and bermudagrasses. Both species seem to have "nearly everything" — attractive texture, beautiful color, ability to spread abundantly and recover quickly. But no species is entirely perfect. The Kentucky bluegrasses have not adapted too well to close-mowing; though the grass persists, weeds invade at a low clipping height. Many varieties are also susceptible seasonally to such prevalent diseases as leafspot and stripe smut. Bermudagrasses require a lot of attention to look their best, and are not tolerant of shade. Most selections grow so rapidly that frequent mowing and thatch removal are required;

it becomes expensive to keep ahead of the grass in an era of costly labor.

But breakthroughs seem to have been made on both fronts recently, — development of Fylking Kentucky bluegrass for much of the North and upper South, Tifdwarf bermudagrass for the deeper South. Both are too new to be thoroughly tested in all climates, under various modes of care; but they promise to correct the deficiencies just cited. Fylking thrives mowed an inch or less, and reports indicate it to be quite resistant to disease, especially to stripe smut, a terror for Merion and Windsor. Tifdwarf bermudagrass was discovered around 1963 at several locations, as a mutant or "sport" out of Tifgreen (the most wide-

ly used golf green variety in the South). Quickly accepted for golf greens, it is now being investigated as a lawn possibility which can endure light shade and which may need mowing as little as monthly.

Fylking from Sweden

Perhaps more is known about Fylking for lawns than about Tifdwarf. Fylking was discovered in Sweden a number of years ago, and widely proved there before being licensed for production in America as the 0217 strain. Hogg and Lytle in Canada, and Jacklin Seed Company in the United States, are the North American licensees. Their North American escotype has been widely distributed to research centers for observation

during the last three years, while seed supplies were being built up. Substantial information has been accumulated on Tifdwarf for golf greens, too, by the Coastal Plain Experiment Station (where Tifgreen originated) and Southern Turfgrass Nurseries at Tifton, Georgia, and elsewhere in the Southeast. Only recently has Tifdwarf been suggested for lawn and fairway rather than solely as a greens grass, uses that are still largely experimental. A fine review of Tifdwarf was given by J. B. Moncrief of the USGA Green Section at the 8th Annual Turfgrass Short Course at Auburn University. Moncrief's presentation appears in the Proceedings of that conference, issued in the spring of 1968. Those interested in Tifdwarf possibilities might want to review this summary.

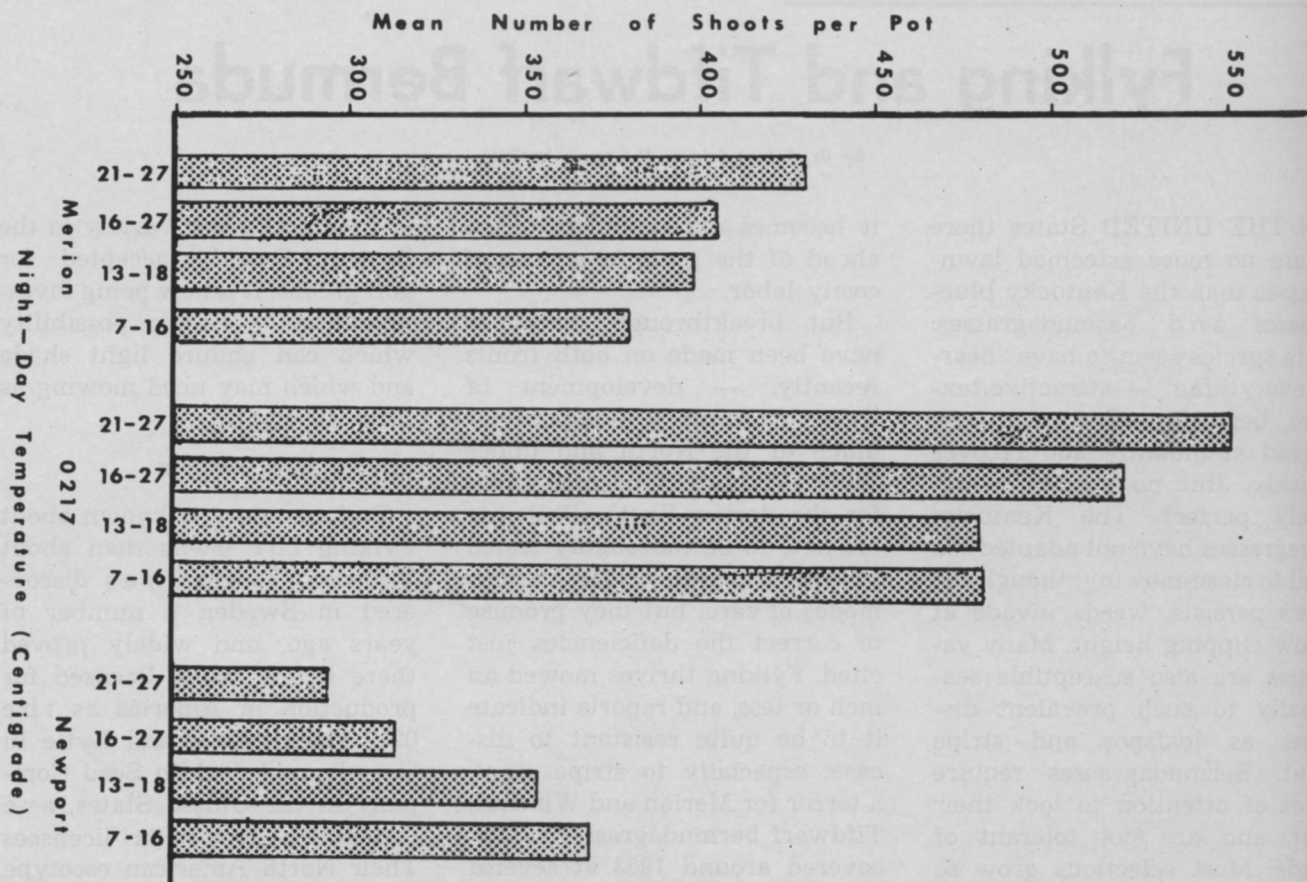
Only this year is Fylking seed being offered to the public, al-

though many sod growers received supplies from which to start sod in 1967. Fylking has been grown at the Lawn Institute for about two years. Some universities have had it under test for several years, and performance reports are beginning to be released. One of the most comprehensive is from Rutgers University in New Jersey, part of the annual "Report on Turfgrass Research" for 1967 (Bulletin 818). With perhaps the most advanced bluegrass breeding program in the United States and with bluegrass selections from all over the world to compare, Rutgers rates Fylking neck and neck with the best of Dr. Funk's own bluegrass hybrids. In one test Fylking rated second, in another fourth, comparing about 60 of the best bluegrass finds Rutgers has assembled. Fylking led all present commercial varieties in summer survival.

Compared to most bluegrasses Fylking seed is a "heavyweight." Perhaps because of this husky seed Fylking sprouts and establishes quickly. In our experience Fylking reaches a growth plateau after several weeks, and for good future performance should be well fertilized. Its leaf blades are narrower than with most varieties (viz. Merion), curve or twist in a graceful arch. Thus more than most bluegrasses Fylking produces a felted surface of interlacing blades. This is accentuated by abundant tillers, an unusually large number of shoots from the crown. Under low mowing many of the tillers lie nearly prostrate. Even under higher mowing the leaf base is reasonably short and the blade strongly bent back, thus tending to escape the mower.

No Serious Disease

So far we have experienced no serious diseases during the grow-



Test data in graph is from Dr. Victor Youngner at the University of California, Riverside. This research compares three different bluegrasses. Note that the average number of shoots per pot is greatest with Fylking, and that compared with Newport it is much more active in the higher temperature ranges.

ing-season on Fylking, in keeping with reported observations around the country. Fylking has not been so competitive in winter as the native bluegrass, although with extra fertilization winter growth may have been more evident. Some snowmold or similar winter discoloration has been noted, perhaps accounting for the fact that Fylking raves mostly focus upon performance during the growing-season under reasonably temperate conditions. How far southward Fylking can be used effectively as a permanent turf is still not known, although its low growth suggests excellent possibilities for winter-seeding Tifdwarf golf greens in the South. The grass has been planted to lawns so far south as Alabama, and is under test in bluegrass-bermudagrass borderland near Raleigh, North Carolina. It has performed well in southern California. Its low growth would seem to make it a "natural" for fairways in combination with other dwarf varieties such as Highland bentgrass.

The Jacklin Seed Company, patentor for the 0217 strain, recommends that it be provided at least 4 lbs. of nitrogen per 1000 sq. ft. annually, divided more or less evenly through the growing season. New seedings should be watered frequently until established, after which watering may await signs of wilting. A seeding rate of 2 lbs. to the 1,000 sq. ft. is recommended for Fylking sowed alone. August and September are the best time to start new lawns. Because tillers and spreading rhizomes are produced so abundantly, in time Fylking seeded alone. August and September are the best times mechanically in early spring or autumn, marring lawn appearance for a few days only. The low growth of Fylking may permit somewhat less frequent mowings than with taller bluegrasses, but, as with any grass, it is well to mow often enough so that only

about one-third of the green leaf is removed at a clipping. Although Fylking endures very low mowing, it probably will be more attractive and with fewer weeds if kept an inch high or nearly so.

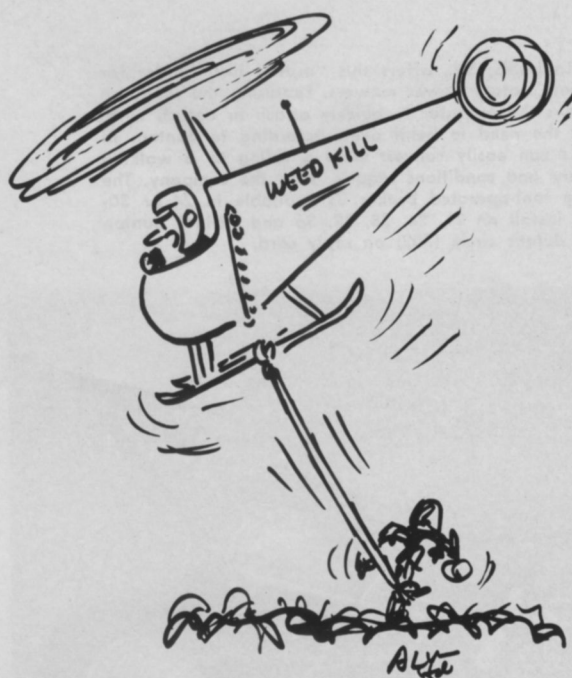
The lawnseed industry is bulging with many fine new varieties for numerous uses. In Fylking and Tifdwarf, turf managers already have at their call two promising possibilities for low-mowed luxury lawns in bluegrass and bermudagrass country. Fylking is available as seed, but Tifdwarf must be started vegetatively.

Fertilize Shade Trees Now, NAA Recommends

Fall is an excellent time of year to fertilize shade trees, according to a report by the National Arborist Association. Although results may not be obvious at this time, next spring

will see your trees leaf out earlier in greater abundance, wearing a glossy, green look of health, says NAA.

Distinct advantages of fall fertilization of shade trees, according to the group, are as follows: (1) Work can be done around trees without damage to turf from trampling, as soil is moist but not saturated; (2) Soil moisture hastens fertilizer breakdown for root absorption; (3) As root growth continues well into winter, an abundance of nutrients in the soil during this period assures development of an extensive root system with increased capability of furnishing moisture and food to trees; (4) Nutritional elements not absorbed in autumn are immediately available to trees when new growth starts in spring; (5) Orders placed with tree service companies are given prompt attention, as autumn brings a decrease of demands for insect control or other work of emergency nature.



"WE'VE GOT A STUBBORN WEED THAT WON'T DIE."

New Products . . .

Designed for the Vegetation Care Industry

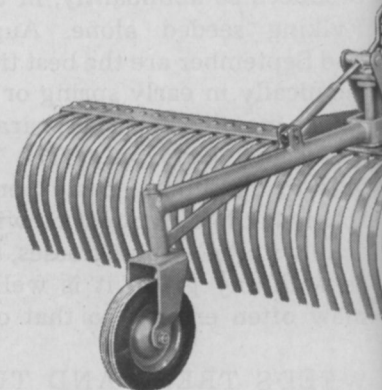


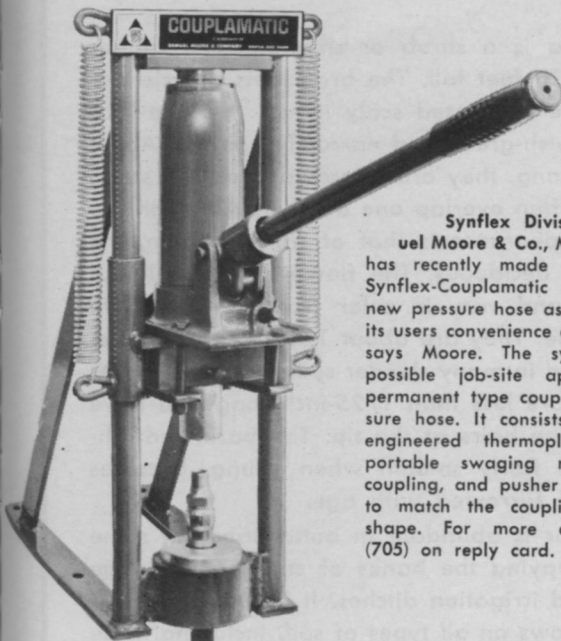
Piper Aircraft Corp., Lock Haven, Pa., has made available what may be the first ag plane on skis—the Piper Pawnee 235. The aircraft was used in Finland for forest fertilization, one of the first instances in which aerial application of agricultural chemicals has been carried out during the winter by ski-equipped planes, says Piper. Frozen lake surfaces near forests being treated were used for landings. Several thousand Pawnees are in use in the United States and 60 other countries for a variety of purposes, according to Piper. For more details circle (701) on reply card.

Bunton Co., Inc., Louisville, Ky., offers this "instant hitch" rider for its line of heavy-duty, rotary power mowers. Featuring the toe-touch hitch, the unit allows the operator to quickly attach or detach without using tools or the need to bend over, according to Bunton. In that way operators can easily convert from a riding to a walking mower where safety and conditions require, says the company. The unit, also featuring foot-operated brakes, is available in 24 or 30-inch wide sizes to install on 21, 24, 28, 32, 36 and 52-inch Bunton mowers. For more details circle (702) on reply card.

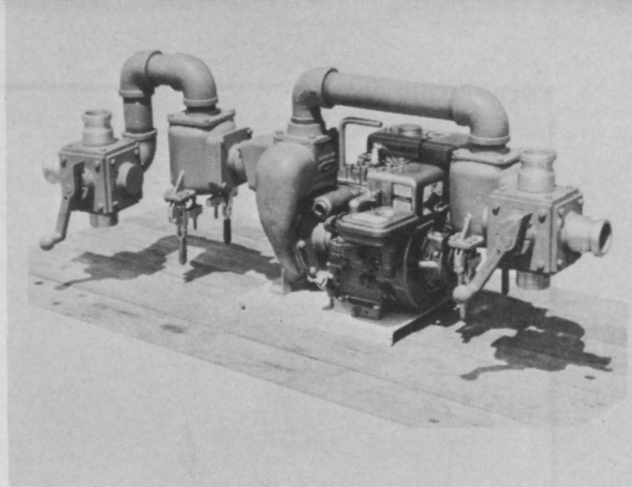


Stihl American, Inc., Midland Park, N. J., offers its 040 water pump with kit for replacing wearable parts. The 1½-inch pump moves up to 4300 gallons per hour, with a total head of up to 160 feet. It offers self priming/cleaning action and is designed for long-life service, says Stihl. For more details circle (703) on reply card.





Synflex Division of Samuel Moore & Co., Mantua, Ohio, has recently made available its Synflex-Couplamatic System. This new pressure hose assembly offers its users convenience and economy, says Moore. The system makes possible job-site application of permanent type couplings to pressure hose. It consists of Synflex-engineered thermoplastic hose, portable swaging machine, the coupling, and pusher and die sets to match the coupling size and shape. For more details circle (705) on reply card.



Load-King—a complete ground liquid loading system for agricultural aircraft—is now available from Transland Aircraft, Inc., Harbor City, Calif. Shown is Load-King Model 8, a Flomax 8 140 gallon/minute pump driven by 3½ HP engine, 2 line strainers and 2 valves. Fast, simple, dependable operation, says Transland. For more details circle (706) on reply card.

Rotary Power, Inc., Houston, Texas, has recently made available its Shur-Foot production mower, able to work on slopes as steep as 35 degrees. Operator and seat, steering wheel and all controls remain level, a feature that highway departments and mowing contractors can appreciate. Mower head follows the ground up to grades of 35°. Turning is easily done within 96-inch radius, says Rotary. The unit consists of all wheel hydrostatic drive, front-mounted 72-inch rotary or flail mower, hydraulically driven power steering. One lever controls tilt to coincide with side of hill being worked, another lifts or lowers equipment such as mower or seeder. Cutting heights range from 2 to 10 inches. For more details circle (707) on reply card.

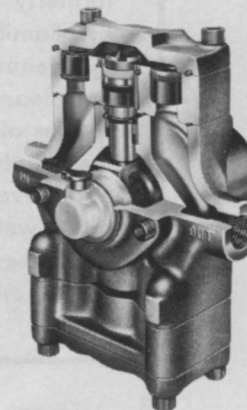


Arps Corp., New Holstein, Wis., has made available a new "mini" rake for compact tractors. Spring steel "fingers" really work soil during lawn building, landscaping. Ideal for clearing brush, stones, debris and spreading topsoil, crushed stones. Rake can be set at 5 different angles plus right angles. Optional gauge wheel keeps rake at right height for the job. Available in 4 or 6 foot length. For more details circle (704) on reply card.

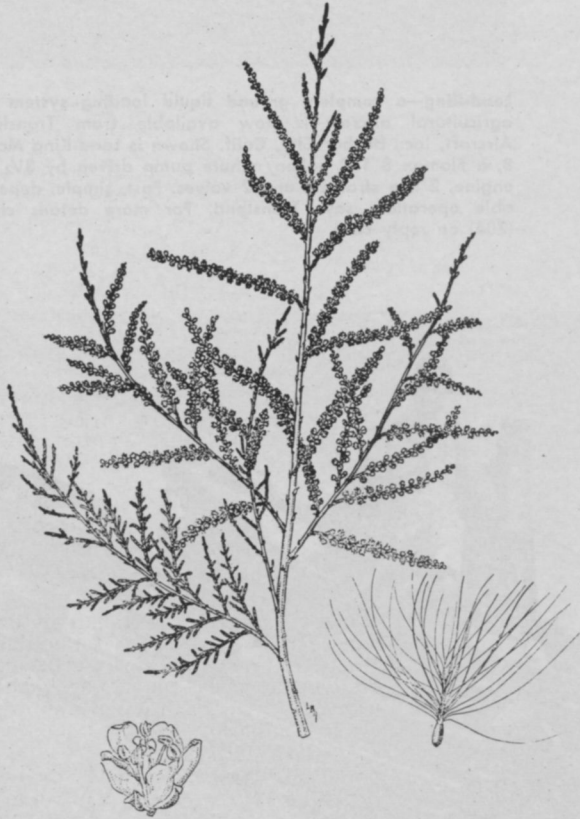


Champion Brass Manufacturing Co., Los Angeles, has incorporated into its pop-up sprinkler a "sure drop" assembly that eliminates the chance of mower damage from an unretracted stem. Other features include a self-cleaning, all-brass stem assembly; flow control adjustment; and capability to vary spray patterns. For more details circle (708) on reply card.

Unique "building block" design of new Hypro Series 5700 piston pumps prevents leakage into crankcase and permits servicing of separate pump assemblies without disturbing other parts, says its developer, Hypro, Inc. of St. Paul, Minn. Twin-cylinder pumps provide pressure to 500 psi in capacities of 2 to 3 gpm. For more details circle (709) on reply card.



SALT CEDAR

(Tamarix ramosissima)

Drawing from: Arizona Ranch, Farm, and Garden Weeds, by Kittie F. Parker. Arizona Agricultural Extension Circular 265, 1958.

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

Salt cedar or tamarisk (*Tamarix ramosissima* — formerly *T. pentandra*) is a member of the Tamarisk Family (Tamaracaceae). The 54 species within this genus are native to western Europe, the Mediterranean region, India and Northern China. This species along with four others was introduced into the southwestern United States as ornamentals and have since escaped from plantings and become well established. For this reason they are sometimes mistaken for native plants.

Like other members of the genus *Tamarix*, *T.*

ramosissima is a shrub or small tree. It ranges from 5 to 20 feet tall. The branchlets are slender with minute appressed scaly leaves that are glabrous, grayish-green and narrowly pointed. About 1/16-inch long, they are so crowded on the stems that they often overlap one another. Although the general appearance is that of an evergreen, the leaves are deciduous. The flowers are small but numerous and vary in color from deep pink to nearly white. They are about 1/16 inch in diameter, crowded in many slender spikes up to 2 inches long, and are less than 1/25-inch long and have a tuft of fine hairs at the tip. The bark, reddish-brown and fairly smooth when young, becomes ridged and furrowed with age.

Salt cedar is abundant in bottomlands in some areas, occupying the banks of streams, drainage washes and irrigation ditches. It is drought resistant and grows on all types of soil, including those that are alkaline or salty. Originally this plant was not looked upon as a weed problem but was considered a desirable ornamental. It was also used as a check on erosion or as a windbreak. However, this plant has spread over large areas since its introduction, due to the fact that its seed is air and water born. The seedlings are apparently able to survive best on sites made bare by flooding or other means; they cannot tolerate competition on soils not underlain with a shallow water table.

Once established, salt cedar is difficult to kill by cutting or burning. It resprouts from both roots and stems and becomes bushier after each resprouting. This plant must be controlled in places where it clogs drainage courses and rivers with its dense growth, making regulation of such streams difficult. In addition, salt cedar consumes large quantities of water each year. This is an important economic factor in the Southwest, where the availability of water determines areas that can be irrigated or used domestically. Much effort has been made to control this plant in several states.

Old plants are difficult to kill with foliage spray. The best practice is to remove the old growth by mechanical means (or by fire) and then to spray the new growth in three to six months. Silvex (2,4,5-TP) is the most effective herbicide that is being used currently. The areas must be retreated as often as is necessary to keep surviving plants under control and to kill new seedlings.

Old plants can be killed by basally spraying them with esters of 2,4-D or 2,4,5-T applied in diesel oil. Applicability of basal sprays, however, is confined to situations where the plants are limited or the areas are small.

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. Boldface rule box: \$25.00 per column inch, two inch minimum.

FOR SALE

ESTABLISHED Lawn Maintenance business in Boca Raton, Fla. Gross income \$24,000 per year. Selling price of \$12,000 includes established customers, truck, trailer, and equipment. Write to: Box 35, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

FARM FOR SALE—120 acre sod farm, all muck and peat. 1/2 mile north of East Lansing on blacktop road. Well and pond for irrigation. All seeded to Merion. John Bower, R. 2, Grand Ledge, Michigan 48837. Phone 517 627-6107.

POOR HEALTH forces sale of interest in a large weed and brush highway operation in northeast. All inquiries confidential. Box 36, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

HELP WANTED

GROUNDS SUPERINTENDENT for one of largest (6000 Apts.) garden apartment developers soon ready to expand into golf course. Operating sites are located throughout eastern U. S. Experience in turf, shrubs, ornamentals, trees and flowers will lead to responsibility for multi-site landscaping or golf course maintenance. Take this opportunity to join Multicon, the leader in the industry. Good salary, benefits and luxury apartment. Send resume to: L. F. Cronk, 4645 Executive Drive, Columbus, Ohio 43221.

Fusarium Blight Resembles Dollar Spot Disease

Dr. George A. Bean, turf pathologist in the University of Maryland's Department of Botany, revealed that symptoms of Fusarium blight—a disease infecting Windsor, Kentucky bluegrass and Merion are somewhat similar to those of dollar spot disease.

Fusarium blight, like dollar spot, causes lesions—one to many per leaf—with white centers surrounded by light brown margins. Lesions usually extend across the width of the leaf, causing a general appearance of cir-

cular light tan areas in infected sod.

The two diseases differ, however, in that blight-infected areas can increase in size until they run together, while dollar spot areas rarely get larger than 4 to 5 inches in diameter and seldom coalesce. Also, with Fusarium blight a few healthy bluegrass plants occasionally remain in the center of an infection circle, giving it a "frog eye" look.

Appearing in early June and remaining sometimes through September, Fusarium blight infects the warmest sections of lawns (such as those near sidewalks or driveways); according to Bean. Slopes with southerly exposure are more severely damaged than others. Of the grasses it infests, Merion is hardest hit.)

Tersan-OM fungicide treatments can prevent or reduce the disease severity, says Bean. Management programs that maintain healthy turf should help in reducing if not preventing its occurrence.

Insect Report

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

Turf Insects

CHINCH BUGS

(*Blissus* spp.)

Maryland: Damage heavy to lawn at Hancock, Washington County.

A FLEAHOPPER

(*Spanogonicus albofasciatus*)

Arizona: Heavy in 2 dichondra lawns in southwest Phoenix area, Maricopa County.

A GROUND PEARL

(*Margarodes meridionalis*)

Arizona: Heavy in 12 Tifgreen Bermudagrass lawns at Tempe, Maricopa County.

RHODES-GRASS SCALE

(*Antonina graminis*)

Arizona: Infested Tifgreen Bermudagrass lawns in many areas of Salt River Valley, Maricopa County. **California:** Adults medium on Kikuyu grass at Encinitas, San Diego County.

SOD WEBWORMS

Utah: Larvae damaging lawns at Logan, Cache County. Most serious

outbreak in past several years. **Maryland:** *Crambus* spp. moths extremely abundant at night in Greenbelt and New Carrollton, Prince Georges County.

Tree Insects

COOLEY SPRUCE GALL APHID

(*Adelges cooleyi*)

Ohio: Galls in moderately damaging numbers on several spruce in ornamental planting in Portage County. Infested spruce in Cuyahoga County.

PAINTED MAPLE APHID

(*Drepanaphis acerifoliae*)

California: Adults medium on silver maple trees at Ventura, Ventura County.

BLACK TURPENTINE BEETLE

(*Dendroctonus terebrans*)

Alabama: Larvae and adults damaged shade pine trees in Lee County; several large lawn trees dying.

ELM LEAF BEETLE

(*Pyrrhalta luteola*)

Nevada: Adults entering hibernation in infested areas of Lincoln County; damage unusually heavy at Caliente and Panaca areas and generally light at Pioche. Light on elms in Esmeralda County northwest of Tonopah, Nye County. Esmeralda County is a new county record. **Texas:** Activity heavy in Dallas, Denton, Collin, Hunt, Hopkins, Franklin, and Titus Counties. **Oklahoma:** Late instars, probably third generation, light on Siberian elms in northwestern area; defoliation moderate to heavy.

BRONZE BIRCH BORER

(*Agilus anxius*)

Oregon: Last instars extensively damaged ornamental birch at Pendleton, Umatilla County. This infestation in residential area for several years. Controls effective on some trees; other trees removed.

BOXELDER BUG

(*Leptocoris trivittatus*)

Oklahoma: Numerous on various trees in northwest Oklahoma City, Oklahoma County.

A LACE BUG

(*Corythucha bellula*)

Pennsylvania: Discolored hawthorn leaves on about fifty 8 to 10-foot-tall leaves. Collected about 5 miles west of Butler, Butler County. This is a new State record.

SYCAMORE LACE BUG

(*Corythucha ciliata*)

Virginia: Damage severe on some sycamore trees in Montgomery County.

YELLOW-NECKED CATERPILLAR

(*Datana ministra*)

Alabama: Larvae feeding on red and blackjack oak foliage in Lee, Randolph, Macon, and Chambers Counties; more numerous than in several years.

FALL WEBWORM

(*Hyphantria cunea*)

New Mexico: Very heavy on shade trees in Dona Ana County. Defoliation heavy on many poplars; much webbing. **Texas:** Activity light to medium on oak trees in Hunt, Hopkins, Franklin, Titus, Morris, and Bowie Counties. Active on mulberry and poplar trees in El Paso County.

MIMOSA WEBWORM

(*Homadaula anisocentra*)

Tennessee: Still active on mimosa in central and western areas.

Lush Winter Turf. Swedish soccer teams playing winter games at Solna, Sweden, this year will enjoy lush, green turf despite the snow. The field has been engineered to beat freezing by combining underground heating cables and a plastic covering. Sod has been installed over a six inch mixture of sand and gravel to absorb excess moisture. Electric cables prevent freezing and can maintain a 54° F temperature. Protection against night frost and drying out of the leaf zone is provided by a giant transparent plastic sheet, more than 260' x 360'. The plastic cover is handled by a motor-driven steel drum. Thus, even in the severe climate near Stockholm, turf growth is induced in early March and maintained until well after killing frosts in the fall.

* * *

New Test for DED Antidote. A new antidote for Dutch elm disease has received clearance for field tests. Registration by the USDA is for a period of one year for a product developed by Charles R. Freers, Muscatine, Ia. Testing will be done in Missouri, Iowa, Illinois, and Indiana. Freers reports that the antidote inhibits continued growth of the DED fungus organisms.

* * *

AAN Legislative Conference. Legislation has had an enormous impact on the nursery industry. So says Bob Lederer who is executive vice-president of the American Association of Nurserymen. Much of the success of the AAN, he says, is in helping members in an intelligent approach to legislation. A third national legislative conference by the AAN is being staged at Chicago this month. Lederer who is backed in his views by the state nursery association secretaries believes this coordination is the only way the nursery industry can avoid errors in judgement and duplication of effort regarding common legislative problems. Listed for discussion at the Chicago session are subjects ranging from wage-hour problems to tax suits.

* * *

Community Programs. New trend in the suburbs is community spray programs. Robert Bartlett, company president for Bartlett, says more property owners are organizing and contracting for tree and shrub pesticide applications on area basis. In some cases, home owners are billed

individually, in others a representative of the suburban group negotiates a contract for the community, collects from each and pays the custom pesticide applicator. In either case, Bartlett states, the cost for each property owner is less. Normal service is a 3-step program: an early spring initial spraying to ward off leaf-eating insects; a late spring spraying aimed at aphids, lace wing flies, white flies, and leaf eating insects; and a third spraying in early summer for mosquitoes and other insect pests.

* * *

Davey Keeps Busy. Davey Tree Expert Company has opened their new 28,000 square foot shop at their Kent, O., headquarters. It is one of five repair and service operations for handling Davey's fleet of 800 vehicles used by crews in 42 states and Ontario, Canada. In addition to cranes, aerial baskets, and crawler tractor sprayers, the company uses 300 brush chippers, 250 shade tree sprayers, and more than 50 tractors. Add to this array 500 power saws, 5000 hand saws and pole trimmers, and 275 electric drills for tree feeding. Davey crews, each year, also use more than 100 miles of manila rope, 75,000 feet of high pressure hose, enough ladders to reach several miles high, and about 1½ million pounds of tree plant food.

UM Suggests How and When to Make Soil Tests

Late summer through fall soil testing has definite advantages over spring testing, says William Fenster, University of Minnesota extension soil specialist.

By taking soil samples in the fall, one can avoid the inevitable "spring rush" and get test results back in plenty of time for spring planting. Fall testing also gives you ample time to decide which fertilizers will best provide proper nutrients for maximum yields, says Fenster.

Furthermore, fall testing allows fertilizers to be applied when soil is in relatively good condition. Waiting for spring to apply fertilizers often causes difficulties if the ground is wet.

As far as soil tests themselves are concerned, results are only as good as the samples on which

the tests are made, according to John Grava, supervisor of the university's Soil Testing Laboratory.

To collect a soil sample that reflects the fertility of an entire field, Grava recommends the following steps.

Divide each field into uniform areas of not more than 20 acres on level land or more than 5 on hilly grounds. Soil in each area should have the same color and texture, cropping history and fertilizer and lime treatments.

Avoid taking soil from low spots, dead furrows, fertilizer bands, urine spots, old fence rows or areas near crushed rock roads.

Before sampling each area, scrape away surface litter. Then sample to plow-layer depth for row crops; for pastures, sod crops or lawns, sample to a 3-in. depth. If using a spade or trowel, dig a V-shaped hole and remove a ½-in. slice from the side of the hole. Place the core in a clean pail; if testing for zinc, use a plastic container.

Repeat this procedure in about 15 places in each of the uniform areas. Mix the subsamples thoroughly, then pour the composite mixture into a pint soil container. (Both containers and information sheets can be obtained from your county extension agent.)

If the soil is wet, let it air dry or send it immediately to the laboratory, Grava said. He also stressed that information sheets be filled out completely so that researchers know which tests are to be run. Also, warns Grava, keep records of where you took the various samples.

Mail to the Soil Testing Laboratory, University of Minnesota, Institute of Agriculture, St. Paul, Minn. 55101. Checks should be payable to the university.

As of mid-September, Grava said, soil tests and recommendations will be computerized to give faster, more efficient service.

Meeting Dates



American Society of Agronomy, 1968 Annual National Meeting. Jung and Roosevelt Hotels, New Orleans, La., Nov. 10-15.

National Aerial Applicators Association, Annual Meeting. Dunes Hotel, Las Vegas, Nev., Dec. 1-4.

National Fertilizer Solutions Association, Annual Convention. Jung Hotel, New Orleans, La., Dec. 2-5.

North Central Weed Control Conference. Sheraton - Lincoln Hotel, Indianapolis, Ind., Dec. 3-5.

Illinois Turfgrass Conference, Illinois Turfgrass Foundation, Inc., Building Auditorium, University of Illinois, Urbana, Ill., Dec. 5-6.

Golf Turf Symposium, Wisconsin Golf Course Superintendents of America and Milwaukee Sewage Commission, Pfister Hotel, Milwaukee, Wis., Dec. 11-12.

New York State Arborists Association, Annual Meeting. Grossinger's, Grossinger, N. Y., Jan. 19-22.

Helicopter Association, Annual Meeting. Diplomat Hotel, Hollywood, Fla., Jan. 8-11.

40th International Turfgrass Conference and Show, Golf Course Superintendents Association of America, Fountainebleau Hotel, Miami Beach, Fla., Jan. 19-24.

American Sod Producers Association Annual Meeting. Fountainebleau Hotel, Miami Beach, Fla., Jan. 22.

Weed Science Society of America Annual Meeting. Caesars Palace, Las Vegas, Nev., Feb. 10-14.

Lawn and Utility Turf Growers Course, Rutgers University, College of Agriculture and Environmental Science Campus, New Brunswick, N.J., Feb. 17-19.

Golf and Fine Turf Growers Course, Rutgers University, College of Agriculture and Environmental Science Campus, New Brunswick, N.J., Feb. 19-21.

Southern Turfgrass Association, Annual Conference. Sheraton - Peabody Hotel, Memphis, Tenn., Mar. 3-4.

Annual Fine Turf Conference. University of Massachusetts, High Point Motor Inn, Chicopee, Mass., Mar. 5-7.

Aerial Applicators Meet Dec. 1 At Las Vegas

Officers and directors of the National Aerial Applicators Association are planning a major event for the 2nd annual meeting, set for Dec. 1-4, at Las Vegas, Nev.

A full 3-day educational program is scheduled for the first time, which befits the convention theme of "planning for profit."

Registration begins at the Dunes Hotel conference headquarters at 1:00 p.m. Sunday, at which time exhibits will also be open. First formal meeting activity will be a Sunday evening get acquainted party at 6:00 p.m.

Monday's opening session will include the formal report of Robert Phillips, Phillips Aero Ag Co., Ceres, Calif., and a panel on profitable new and unusual uses of ag aircraft by state N-TRIPLE-A presidents. Also, Les Mills, Les Mills Aircraft, La Crosse, Wash., will moderate a panel on applicator pilot training.

Other feature items on the 3-day program include new research and development of aircraft and equipment by company representatives, profitable business practices, airframe and engine maintenance, new chemical uses, business of aerial application, methods of preventing profit loss, the outlook for the business, and the annual business meeting.

All events, however, will not hinge on the comprehensive education program. Fifty commercial suppliers and manufacturers will exhibit their equipment and supplies, two cocktail parties are scheduled, plus a Dunes dinner show. A busy program is planned for the 100 wives of members who are expected to attend.

F. Farrell Higbee, executive-director of the N-TRIPLE-A, reports that plans are being made to accommodate 400 members and commercial representatives.

Dry-Film Lubricant Air Dries in Minutes

Dag 299, a dry-film molybdenum disulfide lubricant, air dries in just 10 minutes to form a hard, dry and durable lubricant coating, according to its manufacturers, Acheson Colloids Co., Port Huron, Mich.

Easy to apply by brushing or spraying, Dag 299 is ideal for applications exposed to weather and for demanding conditions (conveyor, sliding door and overhead crane tracks, exposed gears, press fitting, hinge pins and semi-trailer coupler plates).

The lubricant consists of tiny particles of moly disulfide dispersed in a thermoplastic resin, which binds the substance to metallic, wooden and most plastic surfaces.

Dry-film lubricants are particularly useful for objects that are difficult to lubricate after assembly and for medium-load, long-wear applications.



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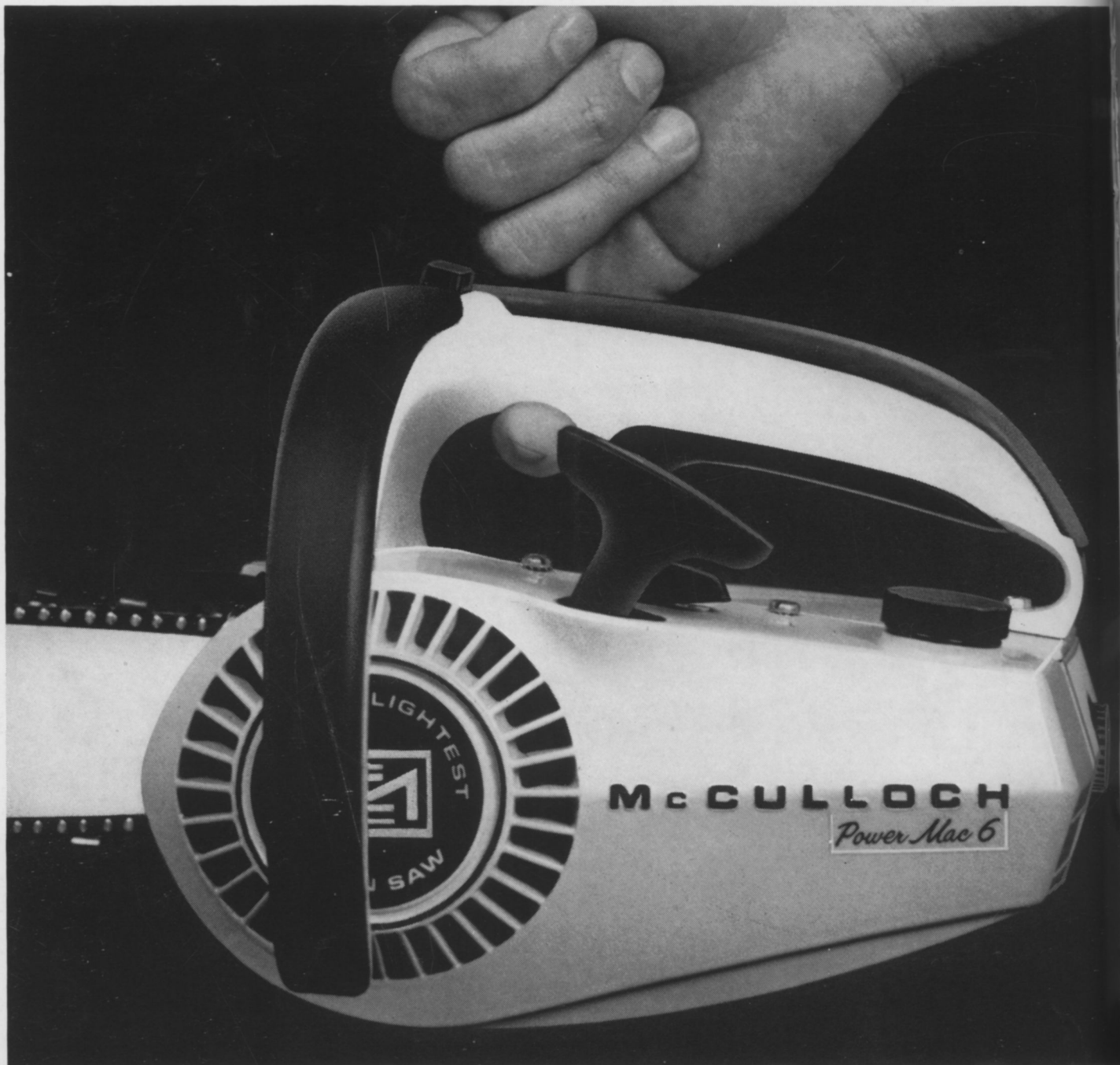
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For More Details Circle (104) on Reply Card



Introducing McCulloch's new Power Mac 6. The world's lightest chain saw. It weighs only 6½ pounds.*

Here's a chain saw you can lift easily with your little finger. A saw so light, so compact it's not much bigger than an electric knife. Notice how the "Master Grip" handle is located directly over the center of gravity? That means you can use just one hand to move the Power Mac 6 safely and easily between cuts. The grip is padded for comfort and all controls are grouped underneath just a finger's reach away. Squeeze the trigger and the light-weight magnesium-aluminum engine delivers more cut-

ting power than most chain saws weighing twice as much. You can cut enough firewood in an hour to last all winter. Zip through an 8-inch log in 6 seconds. Fell trees up to 2 feet in diameter. Use it to clear land, prune limbs, even build small buildings. The Power Mac 6 is big news. And there's lots more news from McCulloch this year, including the amazing "Quiet Line"—with the "Sound Silencer" muffler that reduces noise impulses up to 75%.† Ask your McCulloch dealer. He's in the Yellow Pages.

*weight less bar and chain †Compared to standard cavity-type mufflers.

McCulloch

6101 West Century Blvd., Los Angeles, Calif. 90045

For More Details Circle (103) on Reply Card