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OCTOBER, 1968



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The Cover

Consulting arborists are on the job across the country. Formally organized less than one year ago, these highly qualified



and experienced arborists are putting their knowledge and ability to use as technical consultants. They have formed a nationally associated group known as the American Society of Consulting Arborists. On the job and featured in this month's WTT cover picture are H. N. Engledow, left, Indianapolis, Ind., and John Z. Duling, Muncie, Ind. In the center is Robert M. Duke, who has charge of grounds and landscaping at Western Electric, Indianapolis.

Problem at Western Electric's well landscaped plant is chlorois among some of the outstanding pin oaks on the grounds. Engledow and Duling, both charter members of the consulting arborists organization, originally planted a number of these same trees in the early 1950's. Duling's tree care company at Muncie still maintains them as well as grounds at the plant.

For more information on consulting arborists and a directory of active members now offering this service, see their story which begins on page 6.

City-Leased Helicopter To Spray Texas Mosquitoes

Councilmen of Fort Worth, Tex., recently leased a helicopter from Bell Helicopter on a 6-month trial basis, primarily for spraying mosquito-infested areas.

Paying \$6,288 monthly for 60 hours of use, the council will have the option at the end of the six months of buying the helicopter for \$33,689.

WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

October 1968

Volume 7, No. 10

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WEEDS TREES AND TURF is published monthly by The Harvest Publishing Company. Executive, editorial: 9800 Detroit Ave., Cleveland, Ohio 44102.

Single Copy Price: 50 cents for current issue; all back issues 75 cents each. Foreign \$1.00.

Subscription Rates: WEEDS TREES AND TURF is mailed free, within the U.S. and possessions and Canada, to qualified persons engaged in the vegetation care industry and related fields in controlled circulation categories. Non-qualified subscriptions in the U.S. are \$7.00 per year; Canada and other countries, \$10.00 per year. Controlled circulation postage paid at Fostoria, Ohio 44830.

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Employee Loyalty

Hard work, sound management, and experience are not the only criteria for business success. Employee loyalty and ability to take on responsibility are equally important.

We've talked to operators in all parts of the country and in every phase of the industry about the problem of getting and then keeping top-notch employees in the company. As a result, we've come to some conclusions, few of which involve take-home pay.

One of the foremost is involvement of the individual in the doings of the company which have to do with his job and his conduct on the job. Employee sessions on a regular basis where policies, progress, and plans are simply hashed over produce a sense of belonging and points up to the individual his worth to the company. Many business managers rely on this type session to keep themselves abreast as well of doings within their operation.

Recognition of the individual is another oft neglected item in developing company loyalty. Compliments for work well done are effective and cost little in time or effort. But more important is the merit increase in salary or the likelihood of promotion once the individual has the needed ability and experience. In short, recognition does much to make the individual aware of the responsibility expected. Loyalty then becomes a valuable by-product.

Closely associated with recognition is concern. Employees who feel that the company is genuinely concerned about them as persons and as important to the company operation return that concern in many ways, chiefly in more than adequate performance of their duties.

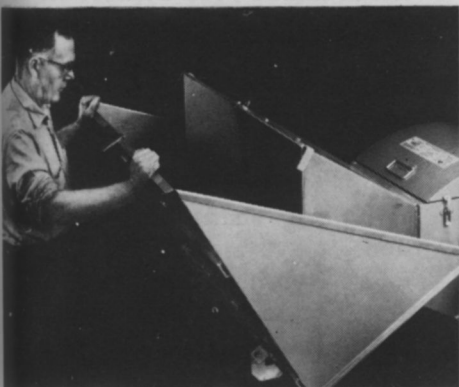
Naturally security is uppermost in the minds of everyone, whether employee, manager, or owner. Employers can do much to instill a sense of security by the manner in which they approach fringe benefit programs such as profit sharing, insurance, retirement, etc. Even their approach to adequate training programs, the opportunity to attend industry meetings, and their personal on-the-job relationship affect the sense of employee security.

Adequate pay is important, too. But this is seldom the factor which determines loyalty. Today, employers generally pay well or they fail to get potentially good people to begin with.

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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The Consulting Arborist

A NEW SERVICE in arboriculture is available. Members of the American Society of Consulting Arborists now offer technical consultation on a nationwide basis. Their ability to provide appraisals and technical advice plugs a gap which heretofore existed in the non-crop vegetation care industry.

Though less than a year old, the group has members in 20 states. These members of the Society find that clients are eager to employ technically qualified consultants. Service in the horticultural field consists of identifying and advising on tree and plant diseases and insect infestations, tree appraisal work, consultation with architects on the outdoor aspects of business and municipal construction, appraisals and valuations as they apply to expropriations and claims. As governments widen streets, change highways and add new thoroughfares there is need for the opinion of the qualified consultant in arboriculture.

Clients who employ the consulting arborist include government departments at all levels, industries, utilities, insurance companies, attorneys, homeowners, and others. Because of their strict code of ethics and affiliation with a nationally organized group, Society members are finding a demand for their services.

Members Not Solicited

The Society, which was some two years in developing a formal organization, does not solicit members. Prospective new members are screened carefully from

written reports and recommendations of Society members. A membership committee of the group makes formal recommendation for membership which is then passed on by the entire Society.

President of the group, Henry Vaughn Eames, a veteran arborist of Stockton, N. J., points out that Society members are a highly selective and qualified group of individuals who are available for special consultant services. Membership is based only on ability as an arborist and members need not belong to any formal group such as the International Shade Tree Conference or the National Arborists Association. Vaughn Eames points out that the group was created because of the need for highly qualified and unbiased opinions for new developments, help in organizing shade tree commissions, surveys, and legal work.

A veteran Canadian consultant, Norman J. Scott, president of the Canadian Horticultural Consulting Company of Willowdale, Ontario, has been helpful to the group. Besides visiting with them at an earlier session prior to organization, he met formally with the group at their recent meeting held in conjunction with the International Shade Tree Conference at Chicago.

Scott who has been practicing in Canada as an individual for a several years finds that he cannot alone meet the demand for his services. He regularly employs university staff personnel to assist him on a fee basis.

At the Chicago session, Scott



Membership Committee of the American Society of Consulting Arborists, left to right: George W. Goodall, Portland, Me.; Walter P. Morrow, Sewickley, Pa.; H. M. Van Wormer, Richmond, Va., chairman of the committee and also vice-president of the Society; and Riley R. Stevens, Portland, Ore.

told the Society members that the one thing they had to sell was their individual professional reputations and their personal integrity. He warned the group to build their Society only by the quality of the individual. He urged members to seek professional help in related fields as needed to arrive at a proper solution to any problem presented them in their work as consulting arborists.

Washington Headquarters

Clarke W. Davis, executive-secretary of the National Arborists Association, has been named to serve in the same capacity for the new Society. Headquarters for Davis and the group is 616 Southern Building, Washington, D. C. Officers besides Vaughn Eames who is president are: H. M. Van Wormer, Richmond, Va., vice-president, and Ray Gustin, Silver Spring, Md., who serves as secretary-treasurer.

Also at the Chicago session, Society members formally ap-

proved their official code of ethics. Besides requiring that every appraisal or consultation for any purpose include a written report signed by the consultant, the

code sets out the specifics of such a report. Every consultant report, for the benefit of the client, must include an adequate description of the trees or plant

President of the American Society of Consulting Arborists is Henry Vaughn Eames, Stockton, N. J., left, and with him, Ray Gustin, Silver Spring, Md., secretary-treasurer of the group.



material appraised, a statement of any special assumptions upon which the report has been based such as the completion or projected public or private improvements, or the validity of legal, engineering, or auditing opinion used if the consulting arborist

has reason to doubt them, the date, amount of loss value, a definition of the value estimated, and a statement of any present or contemplated interest in any plant materials involved if such interest exists.

Preamble for the Society

states that the group was founded to elevate and improve the standards of the consulting practices of the arboricultural profession, and pledges Society members to maintain a high level of trust and integrity in their practice.

American Society of Consulting Arborists

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well structured soil and

drainage are critical in

Golf Green Construction

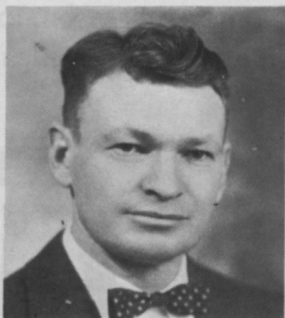
Construction, maintenance and renovation of putting greens make up the greatest cost item in the budget of the average golf course. Golfers demand a high quality putting surface and it becomes the job of the golf course administration to see that they get it.

About half of all strokes by the average to good golfer will be made on the greens. Further, the total surface area of these greens may be only one or two percent of the entire acreage in the course. These facts alone point up the need for careful greens construction and mainte-

nance to produce good putting surfaces.

Charles Calhoun, Ames, Ia., says that most problem greens have "built-in" features. Most common are poorly drained topsoil coupled with an inadequate system of underdrainage, if any. With heavy play on such greens, the problem grows because topsoil compacts easily and the needed large pore space for drainage is lost.

Calhoun, who works closely with golf course superintendents in Iowa and edits their association newsletter, does consultant work on course construction and



Charles Calhoun

In Brief:

Golf greens fail most often because of poor drainage. Rebuilding existing greens or constructing new ones are expensive processes if the job is done right. Yet with the extensive play today on most courses, administrators can seldom afford not to obtain the best greens possible. WTT this month presents the ideas of Golf Course Consultant Charles Calhoun, Ames, Iowa, a turfgrass specialist with many years experience in working with golf course construction. Calhoun has worked out a system for mixing and laying down topsoil, sand, and peat which produces a well drained green. WTT presents the steps in his system in picture form along with his ideas on golf course management.

is a consulting turfgrass specialist. As such he has studied many of the underlying problems in course construction which lead to turf maintenance problems. He lists five key causes of problem greens which affect operators and owners of golf courses.

Specific Problem Areas:

No. 1 problem, according to Calhoun, exists because many golf courses were built years ago with only native soil of the area. From year to year various types of topdressing have been added, layer upon layer. Next problem, he says, is the fact that many courses have been built with poorly engineered plans and specifications. No. 3 problem area has been the "cutting of corners" because of a shortage of funds or financing. Poor supervision or inspection during construction of greens accounts for many not meeting specifications. And finally, the fifth problem listed by Calhoun is the "built-in" problems which result from poor maintenance procedures, particularly regarding use of topdressing and soil amendments.

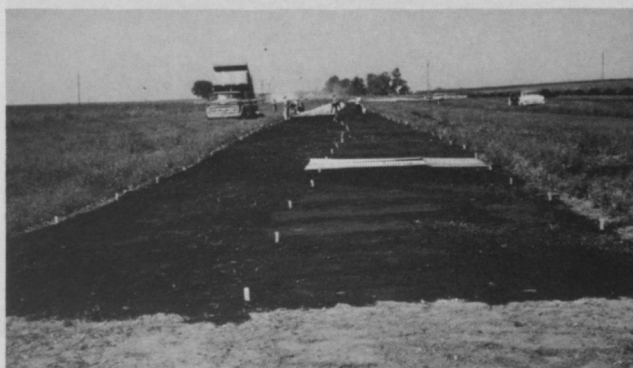
Seasonal changes also unduly affect problem greens. Most greens, Calhoun states, will recuperate in the fall and the following spring after being given a good renovation treatment. Areas where cold winters prevail benefit by the natural aeration of freezing and thawing.

Then in the spring, grass on such greens gets a good start and by May is in excellent shape. But deterioration begins shortly with heavy foot traffic which reaches a peak during the hottest part of the summer. Greens soil which was a lively dynamic medium in the spring becomes a compressed often soggy plastic-like mass. Pore space is lacking to the point that life-giving oxygen for grass growth is choked off. With this low oxygen supply condition, excessive (toxic) carbon dioxide concentration and

Step 1. Roto-tilling soil in 20-foot strips permits equipment to work on both sides without compacting. Soil has previously been spread to rough 4-inch depth by grading.



Step 2. Peat (1½ inch depth) is added to roto-tilled topsoil. Work is being done at Jesup Golf and Country Club, Jesup, Ia. Considerable work was done by hand labor.



Step 3. Calculated amount of sand was dumped beside mixing strip prior to spreading. Then sand (1½ inch depth) was placed on top of peat. Doing work in strips facilitates mixing with equipment.



Step 4. Sand, peat, and topsoil are mixed thoroughly with roto-tiller. This final mix will be moved to green site and carefully spread to avoid compaction.



Green site prior to adding mix. Mix is pushed onto site. Heavy equipment is used on green only after buildup of 10 inches or more of topsoil mix.





Equipment such as this used at Jesup, Ia., course is practical for moving and handling topsoil mix.



Drainage system is installed prior to forming of basin for green. This important step is often neglected.

other toxic byproducts such as methane and cyanide derivatives are often formed. Research further shows that at the same time, physiological processes of water and nutrient uptake are drastically curtailed or altered. This causes unbalance in the other numerous functions of normal plant behavior.

With a physiologically disabled turf population, high temperature periods often bring on failure. Many golf greens do not reach this critical stage but only approach it by degrees. Good judgment and luck often enable the superintendent to pull the green through in fair shape.

Solutions:

Poorly constructed greens require many unnecessarily wasteful and expensive hours of maintenance. Calhoun makes this statement advisedly because superintendents often have to do their best with what is available. But it may be wise, he believes, to consider spending some extra money in the beginning, knowing that it will be amortised in savings over the years. Choices for the golf course administration are (1) to build greens properly from the start, (2) to rebuild problem greens at one time or piecemeal as budgeting permits,

or (3) maintain, renovate, and gradually improve existing greens. The latter is usually standard procedure.

Where the decision is made to get along with problem facilities, the fundamental procedure is to open or fracture the soil, and preferably permit entrance of desired soil amendment materials to improve air and water circulation. But as the budget permits, Calhoun believes it best to start a rebuilding program for greens. Money saved in lower maintenance costs will soon pay the original bill.

Green Structure:

Basically, a well structured soil which provides a good putting surface will have the ability to hold properly sized pore spaces for adequate water and air circulation within the growth medium.

Construction features of such a green involve four key components. First is the greens topsoil mixture for a growth medium to accommodate grass. No. 2 is a coarse ingredient such as concrete sand to impede downward movement of the topsoil mix. Then, thirdly, a coarser ingredient with particle size of 1/4- to 3/8-inch diameter, such as pea gravel, is needed to permit rapid

downward movement of excess water but which will hold back the finer material. Finally, the fourth feature consists of hollow, permeable conduits to carry away the excess water as it drains off. The greens section of the United States Golf Associ-

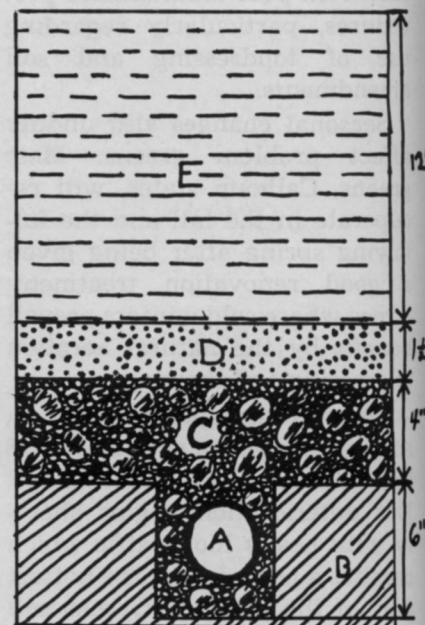


Figure 1. USGA Cross Section of a Putting Green Profile Showing a Trench and Tile Line. A. 4-inch diameter tile. B. Subgrade of native soil or fill material. C. Gravel—preferably pea gravel of approximately 1/4" diameter. Minimum thickness 4 inches. D. Coarse sand—this sand should be a size of 1 mm. or greater. One and one-half to 2 inches in thickness. E. Topsoil mixture. Minimum thickness of 12 inches.

What is there to weed control besides just killing weeds?

Maybe the area to be treated is already weed-free. Or maybe it's infested with established weeds. Perhaps the weeds are annuals. Or deep-rooted perennials that ordinarily are more difficult to control.

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ation must be credited for the original concentrated research to develop an idealized green profile. Figure 1 shows a cross section of the USGA standard specifications.

The USGA recommends a loose, 12-inch minimum thickness layer of well drained topsoil mixture, a 1½- to 2-inch layer of coarse sand with particle size 1 millimeter or greater and a 4-inch minimum thickness layer of pea gravel of approximately ¼-inch diameter particle size. Water will drain through these layers into a 4-inch tile drain.

Because placing a layer of sand over a layer of gravel without mixing the two in the process is a problem, few contractors are willing to do the meticulous job necessary for such an installation. Further, golf course administrations often balk at the relatively high cost involved. So, Calhoun says, a compromise method is often used which consists of using a mixture of sand and gravel in a single 5- to 6-inch layer under the topsoil. Excess water then drains through this layer and into the conduits. This permits quite rapid although slower drainage and at the same time

impedes the downward movement of the topsoil mixture. See Figure 2.

Topsoil Mixture:

Calhoun deals in basic fundamentals in describing a good green topsoil mixture. Ordinarily, he says, it is made up of a natural native soil, sand, and a good quality of somewhat decomposed hypnum or sedge peat (See picture series on topsoil mixture used at Jesup Golf and Country Club, Jesup, Ia., construction of which was designed and supervised by Calhoun). Commercial products are on the market, Calhoun says, other than these mentioned which also do a good job. The final determination as to how much of each ingredient to use is best left for judgment of a qualified specialist. Such a specialist can provide a laboratory physical test of the materials to be used along with recommendations and specifications. At the same time it is advisable to arrange supervision and inspection during the progress of construction.

As a rule, the range of sand volume to be used will fall between 45 and 65 percent of the

total final volume. The peat, Calhoun believes, should consist of 10 to 20 percent of the total. It is commonly believed that a soil with 30- to 50-percent sand in the natural state would not require much additional sand, but this is not the case. The sand in most natural soil consists of very small particle sizes and tends to clog rather than contribute much to the drainage and circulation characteristics necessary in the final profile.

In putting the topsoil mixture ingredients together, Calhoun has found it best to lay out 20-foot wide strips for mixing. This permits equipment to work on each side of the strip without disturbing the mix during the process.

Further, when the mixture is hauled and placed beside the green it can be worked onto the green with heavy equipment. But he makes sure that the equipment never crosses the green until at least 10 inches of the topsoil mixture is in place. This is done by working the mix onto the green ahead of the machine.

Costs are difficult to estimate, Calhoun says, because of the difference in wages between areas. Generally, he has figured labor at \$3 per hour which makes materials handling run 40 to 50¢ per square foot. Thus, a medium sized green of 5000 square feet will run from \$2000 to \$2500.

Summary:

Fundamentals of proper green construction, Calhoun strongly believes, must be carefully followed to avoid later problems and high maintenance costs. Mistakes which appear small during construction can cause future troubles. It is as important money-wise and efficiency-wise, he says, to hire a professional to design the green and to administer construction, as it is for an expensive building. When done right, excellent greens and happy golfers result, which is the primary purpose for the venture.

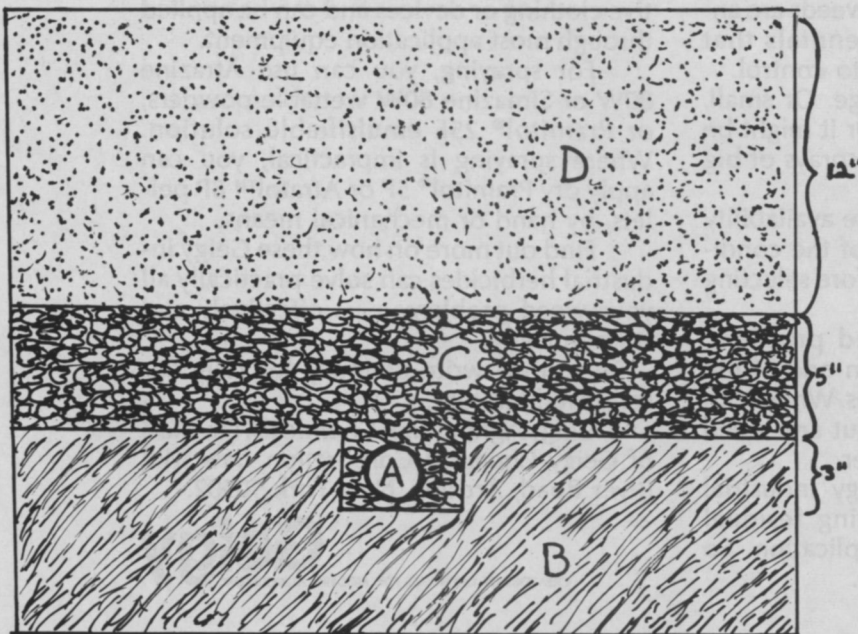


Figure 2. Cross Section of a Putting Green Profile with Simplified Construction and Lower cost. A. Hollow performance drainage conduit. B. Subgrade. C. Coarse sand-gravel mixture. D. Topsoil mixture. (45-65% sand).

4 reasons why it pays to spray for Dutch elm disease control this fall



- 1. Effective.** Most authoritative researchers have stated that DDT sprays applied in the fall are just as effective in preventing elm bark beetle feeding, during the period of tree susceptibility to Dutch elm disease, as sprays applied in late winter or early spring. Our co-operative research tests with a Midwest University bear out this conclusion.
- 2. Better weather.** There usually are more good spraying days in the fall than in spring. It is much, much easier to get thorough coverage on a pleasant, relatively calm fall day, than on a gusty day in spring.
- 3. Efficient use of labor.** You get better distribution of work loads by beginning your Dutch elm sprays in the fall — finishing in spring, if necessary.
- 4. Fewer bird problems.** There are fewer problems with birds and other wildlife (real or imagined) when you spray in late fall.

To assist you in saving our beautiful elms, we offer: **AMOCO® Elm Spray**—25% DDT plus White Oil, the “old standby” in Dutch elm disease control programs, proved effective in wide commercial use since its introduction in the early 1950’s.

AMOCO® Elm Spray-32.4—32.4% DDT in a carefully selected xylene solvent, also used with very satisfactory results since its introduction in 1960.

AMOCO® Methoxychlor Spray—Used in many control programs, mainly in the spring, for maximum safety to birds.

For products, information and American Oil help on your specific pest control problem, contact your local American Oil Office, your spray materials dealer, or write direct to: American Oil Company, 910 South Michigan Avenue, Chicago, Illinois 60605.



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For More Details Circle (108) on Reply Card

In Brief:

Niagara Chemical Division of FMC Corporation has developed a urea-carbamate compound which shows high promise as a soil sterilant for railway, utility, and highway rights-of-way and for industrial sites. The new broad spectrum herbicide, designed specifically for non-crop uses is in the final trial stages and will be test marketed for one year. *WEEDS TREES AND TURF* magazine presents in this October, 1968 issue a complete report on the new product.

In Final Testing Stages for Non-Crop Uses

New Broad Spectrum Herbicide

DEVELOPMENT of a broad spectrum herbicide that demonstrates high effectiveness as a soil sterilant for railroad, highway and utility rights-of-way, industrial sites, and non-crop farm areas has been disclosed by FMC Corporation's Niagara Chemical Division.

The material, substituted urea-carbamate compound that combines the recognized herbicidal activity of each of these molecular structures, has received an experimental permit that allows test marketing for a period of one year. Under development for the past four years, it is expected to receive full registration during the current year.

Called Tandex™, the herbicide is distinguished by its ability to control a wide spectrum of weeds, including woody species, and its low order of toxicity. It can be applied as either a pre-emergence or postemergence treatment to combat annual and perennial broad-leaved weeds

and grasses as well as woody species.

Formulations:

In its final testing stages, Tandex herbicide is available as an 80% wettable powder (80WP) and as a 4% granular (4G). The wettable powder can be applied in either water or herbicidal oil. Oil or oil-water mixtures are preferred over water where rapid contact kill of vegetation is desired. Addition of a wetting agent at levels up to 1% has also been found to increase the contact activity.

Biological Activity:

Although the new herbicide is primarily absorbed through the roots, it is also absorbed slowly through the foliage. Optimum results have been achieved when sufficient moisture was available after treatment to carry the material into the root zone.

Weeds may still appear after

preemergence application, but they soon become chlorotic and the foliar tissues subsequently desiccate and die. Woody species may bear some leaves after treatment, but they also gradually become chlorotic and die. Postemergence applications have been found most effective when applied to rapidly growing weeds or brush.

Soil Sterilization:

As a soil sterilant the new herbicide appears most promising for use along railroads, highway shoulders, under asphalt or cement roads, runways, parking lots within military installations, tank farms, industrial sites and in non-crop farm areas.

Tandex 80WP has been effective as a wettable powder or granular formulation in controlling a broad spectrum of annual broadleaf weeds and grasses at a rate of 2.4 to 4.8 pounds active ingredient per acre. It has been



New broad spectrum herbicide, Tandex™, was applied along this industrial fence in Oildale, Calif., to control annual broadleaf weeds and grasses. Plot in foreground was treated with 7.5 lbs. per acre of Tandex 80WP. Plot behind it was treated at 3.75 lbs. per acre. Application was made in March, 1966. Photo was taken in May, 1967.

applied at 5.6 to 9.6 pounds active ingredient per acre where fibrous-rooted perennial weeds predominate. A rate of 12 to 24 pounds active ingredient per acre may be required to provide long term residual control of perennial weeds having extensive underground rootstocks. The higher levels of dosage ranges are needed for soils high in clay or organic matter or where existing weed growth is approaching maturity.

The use of sterilant herbicides frequently involves an initial treatment followed by annual applications at lower dosages to maintain vegetation control. On areas containing diverse weed populations, Tandex 80WP has been successfully employed at from 10 to 15 pounds per acre the first year, 6 to 8 pounds the second year, and 3 to 4 pounds in subsequent years. Higher ap-

plication rates are necessary for use on areas predominantly infested with deep-rooted perennial weeds on heavy soil-types and in areas subject to high rainfall.

Brush Control:

To control brush along rights-of-way, fence rows, and other non-crop areas, where an understory of sod is not to be completely eliminated, a 3-pound rate of Tandex 80WP (plus surfactant) per 100 gallons of water has been sprayed on the foliage. When applied at full-foliage time, this treatment controlled a wide variety of brush species, including conifers and maples, both of which are difficult to control with 2,4-D and 2,4,5-T or their combinations.

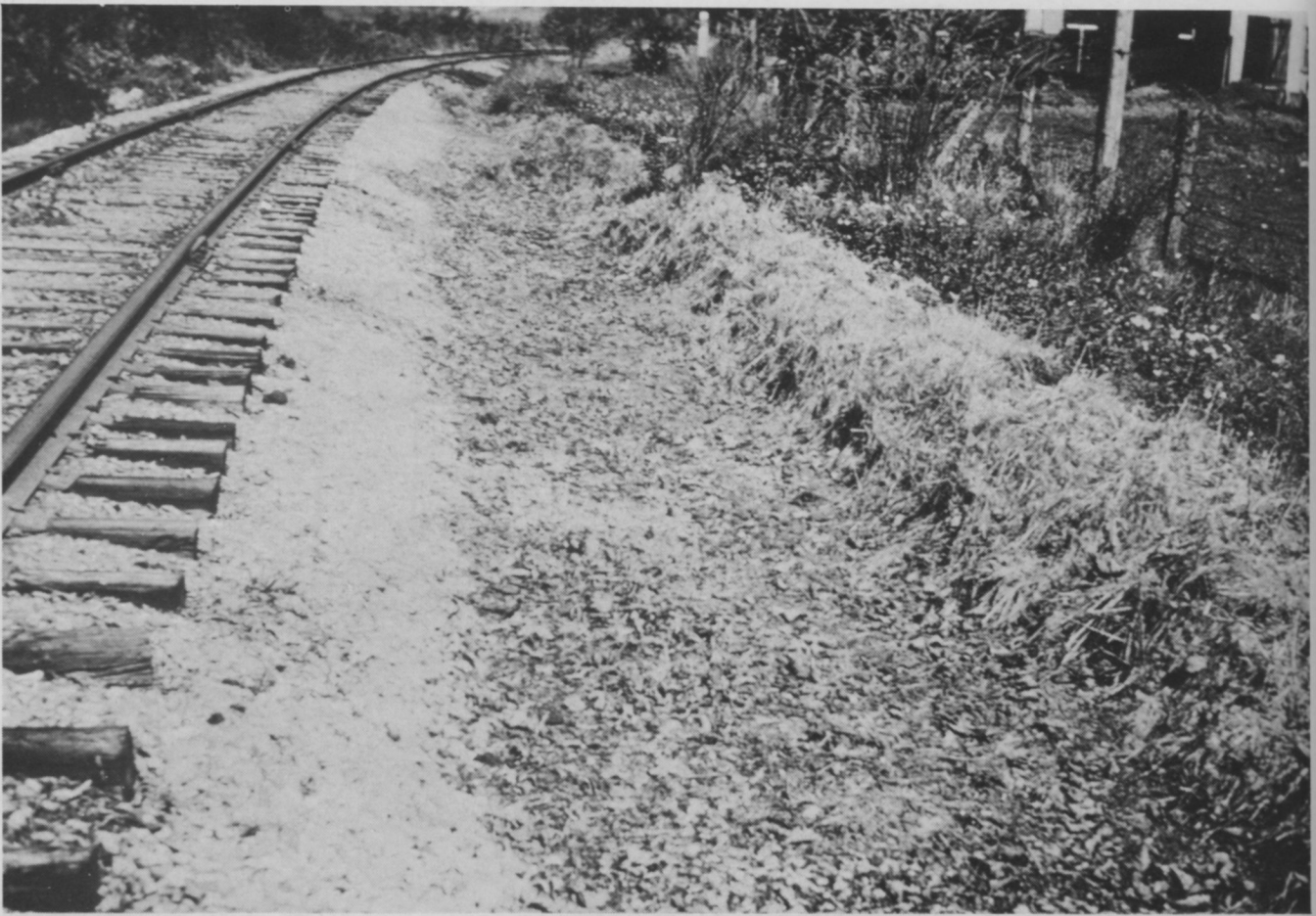
Excellent control of hardwood and coniferous brush species has been noted with the use of foliar

sprays containing 1.5 pounds of Tandex 80WP combined with 2-pound acid equivalents of a mixture of 2,4-D and 2,4,5-T esters per 100 gallons of spray in areas where dangers from the toxic vapors of the phenoxy compounds do not exist.

Basal soil treatment with a 10% granular form at rates of 1 to 5 ounces formulated material per shrub has provided good control of interior live oak and California scrub oak. Granules were scattered evenly around the base of shrubs within the drip line. Broadcast applications at 10 to 20 pounds active material per acre have resulted in good control of interior live oak and yerba santa and have given complete vegetation control in fire-break areas.

Treatments:

Label directions in the permit



Annual, perennial, and woody weed species along this Maryland right-of-way were treated in June, 1967, with Tandex 4G at 350 pounds per acre (14 lbs. actual). Picture was taken in October, 1967.

issued for experimental use of Tandex recommend that application of either the wetttable powder or the granular be made just before or during the period of active growth of the weeds to be controlled. For best results, sufficient moisture from rainfall or artificial means is necessary after application to carry the chemical into the root zones.

A dosage of 3 to 6 pounds of

Tandex 80WP or 60 to 120 pounds Tandex 4G per acre is suggested to control: barnyardgrass, bromegrass, bluegrass, buckhorn plantain, cheatgrass, crabgrass, cinquefoil, clovers, cheeseweed, dog fennel, fiddleneck, foxtail, lambsquarter, pigweed, puncture vine, purseland, ragweed, smartweed, sudangrass, thistles, and turkey mullein.

A rate of 7 to 12 pounds of

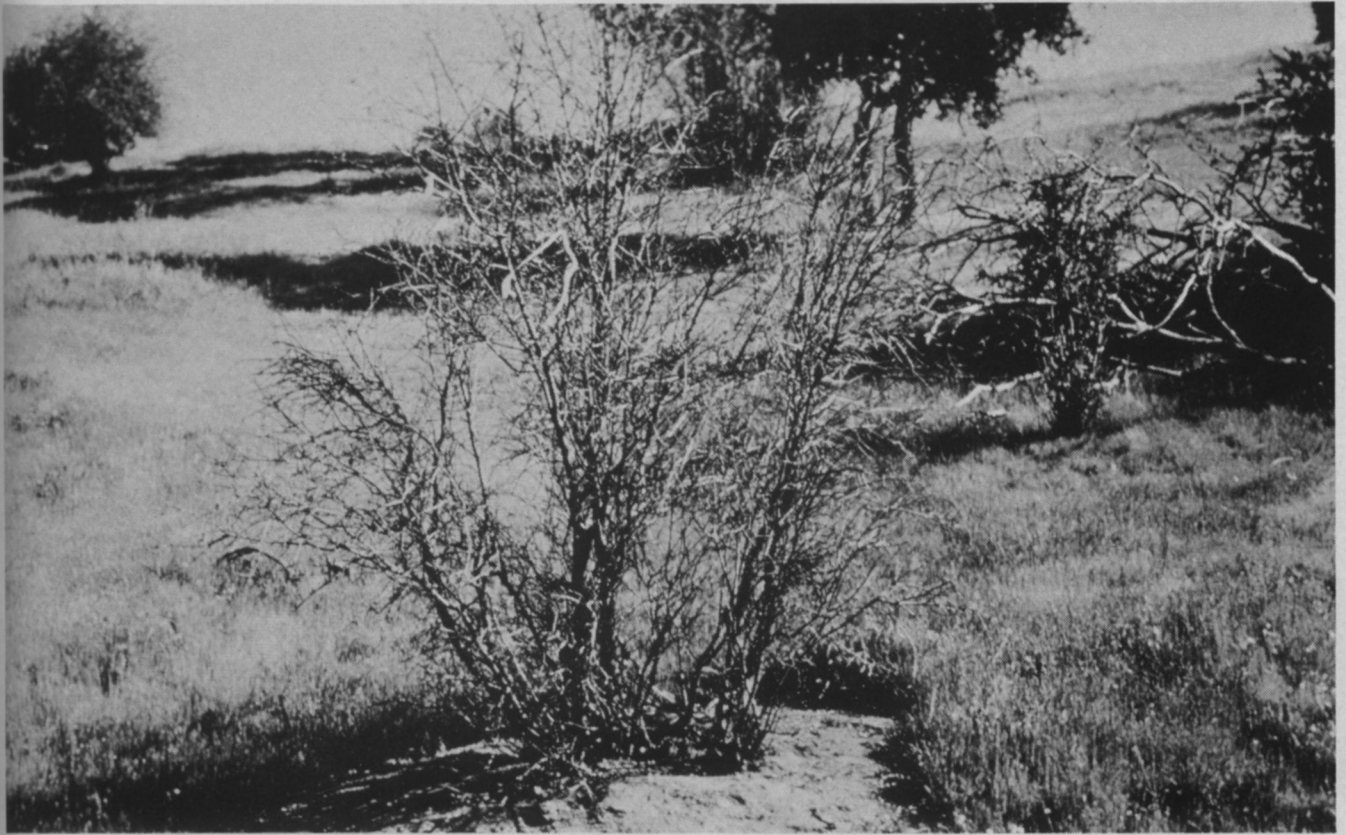
Tandex 80WP or 140-240 pounds of Tandex 4G per acre is suggested to control bindweed, brambles, docks, gumplant, ground cherry, Canada thistle, horsetail, milkweed, nettles, quackgrass, sheep sorrel, velvetgrass, and western ragweed.

To control Johnsongrass, an application of 5 to 10 pounds of Tandex 80WP or 100-200 pounds of Tandex 4G per acre during the dormant season is specified. It should be followed later with foliar applications of MSMA at 4 pounds per acre.

Label dosage of 15 to 30 pounds of Tandex 80WP or 300 to 600 pounds of Tandex 4G are suggested to control: ash, aspen, elderberry, hawthorn, sumac, Bermudagrass, dallisgrass, nutgrass, vaseygrass, field bindweed, poison ivy and hedge bindweed. For saltgrass control restrict treatments to soils low in organic or clay content.



Along this highway in San Jose, Calif., Tandex 80WP was applied at 7.5 lbs. per acre in March, 1967, followed by a maintenance treatment rate of 3.75 lbs. per acre in February, 1968. Picture was photographed in April, 1968.

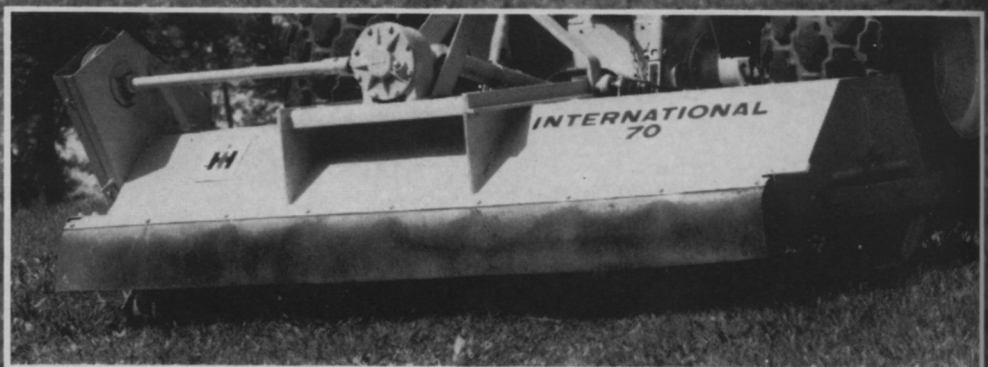


This interior live oak at North Fork, Calif., was treated with Tandex 4G at 500 pounds per acre (20 pounds actual) in January, 1968. Picture was taken in April, 1968.



Among the weeds controlled at this location in Susanville, Calif., were: crested wheatgrass; downy brome; various broadleaf weeds, sagebrush; horsebrush; and lupine. Tandex 4G was applied at 100 pounds per acre in November, 1966. Picture was taken in September, 1967.

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Mow fairway smooth quicker than ever

New International 2444 tractor with matched gang mowers

Specifically matched for manicuring large expanses of turf at minimum expense—new International 2444 tractor and lift-type gang mowers.

A true turf tractor, the new 2444 is a quiet-running, 47 hp husky. A compact low-profile rig with a short wheelbase, 8½' turning radius and full-time hydrostatic power steering. High-flotation tires protect your finest grounds. Wide stance gives you extra sidehill safety. Includes differential lock and constant running PTO for sprayers, other gear.

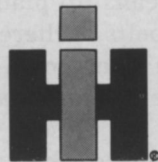
You mow quicker, neater than ever with a 5-gang mower. A reel ahead of each rear wheel cuts the grass before the tire. With three trailing gangs, you cut an 11' swath. That's three times faster than a 3-reel, self-propelled combination to lower your time and labor expense.

Exclusive rear drive behind the reels allows the reels to overhang curbs up to six inches without dropoff. This eliminates expensive hand trimming. The five-gang, 11-foot mower reduces to three gangs and a 7-foot cut for tight quarters. Attach or remove mower from the 2444 tractor inside of 10 minutes. You can pick up, transport and drop the mowers with fingertip hydraulic hitch control.

Choose 7' or 11' mowers. Select laminated, puncture-proof tire drive with 1" to 3½" cutting heights—or hollow roller drive with ¾" to 2½" cutting heights. See your dealer for details on the worth-more features of a 2444 mowing combination. Financing is almost as flexible as you want to make it.

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National Arborist Association Class I safety award was presented to Hackett C. Wilson, right, Wilson Tree Company, Shelby, N. C., at the recent NAA summer meeting at Chicago. Making the presentation to Wilson is Kenneth P. Soergel, Gibsonia, Pa., president of NAA.

Proper Weed Control Aids Shelterbelt Tree Growth

Trees in windbreaks and shelterbelts often die within their first years of growth unless weeds are controlled, says Marvin Smith, extension forester at the University of Minnesota.

Simazine can be used effectively if the shelterbelt is clean-cultivated and the chemical applied on the cultivated ground. However, Smith cautions, it is not recommended for use on any species of poplar (cottonwood) or willow trees or for trees under three years of age. Also, simazine should not be used more than once a year, according to Smith.

Another herbicide, amizine, effectively cleans up plantations and shelterbelts where trees have become overgrown with annual weeds and grasses. Mow tall weeds as closely to the ground line as possible and remove them. Then spray the re-

growth with amizine when four to five inches tall.

As amizine can damage foliage of conifers and hardwoods, it should be sprayed directly on the weeds.

For more information, write for a copy of Forestry Fact Sheet No. 6, Bulletin Room, University of Minnesota, St. Paul, Minn. 55101.

Water Loss in Plants Studied in California

University of California at Davis researchers, hopeful of improving the internal water status of plants during adverse weather conditions, are experimenting with anti-transpirants (materials that prevent plants from losing too much water).

Limited UC experimentation has led researchers to speculate that using anti-transpirants are

beneficial to ornamentals in the following ways: (1) reduction of plant growth of nursery stock while held in nursery (2) prevention of wilting during transport and replanting (3) reduction of irrigation needs and watering traffic hazards, increase of range of useable plant species and reduction of pruning needs in highway landscaping (4) extension of shipping and display life of cut flowers (5) growth decrease that reduces pruning and maintenance costs of establishing plants; increase of plant varieties within parks plus better and longer-lasting blooms.

Foreign Tree Species Studied at Clemson U

Foresters at South Carolina's Clemson University are probing the question of whether or not desirable foreign tree species can grow in their state. Several hundred species have been planted in the university's arboretum for study and evaluation.

Although it is still too early to determine which trees can make it for certain, Clemson has reported favorably on several, including the Cedar of Lebanon, Oriental spruce and Storax—all Turkish species.

Three Zelkovas—Japanese imports that resemble the Dutch elm—planted five years ago are showing no evidence of serious insect or disease problems, according to the foresters. Therefore, when and if the Dutch Elm disease so prevalent in northeastern states spreads to South Carolina, Clemson may be able to suggest this species as a substitute able to withstand the disease.

The foresters report that they expect the various exotics to be helpful in forestry breeding work at the university in the years to come.



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 cutting 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 gives you a lot of saw for your dollar. Get your hands on one at your McCulloch dealer. He's in the Yellow Pages under "saws."

*weight less bar and chain

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Safety award honorable mention certificate awards were made recently by the National Arborist Association at their summer meeting. Left to right are: James Turner, Atlanta, Ga., accepting for Raymond Wright, Wright Tree Service, Roswell, Ga.; Carl Minton, Tree Transplant, Inc., Houston, Texas; Eugene Nyland, Smith Tree Service, Inc., Westlake, O.; Robert Petrie, Riverwood Landscape & Tree Co., Cleveland, O.; Jerry Osborne, Osborne Bros. Complete Tree Service, Mentor, O.; Walter Morrow, Morrow Tree Co., Sewickley, Pa.; Mrs. Kay Jones, Gales' Tree Service, Belleville, Ill.; Bill Lanphear III, Forest City Tree Protection Co., Cleveland, O.; Lew Dinsmore, Dinsmore Tree Service, St. Louis, Mo.; and Bill Rae, Burlington, Mass. accepting for Joseph Brine, Brine's Tree Surgery, Bedford, Mass. The following firms also received Honorable Mention Certificates

but were unable to attend: Austin B. Carroll, Carroll Trees, Sacramento, Calif.; Phil Chambers, Akron, O.; Chester Valley Tree Experts, Pottstown, Pa.; Charter Tree Service, W. Acton, Mass.; Gledhill Nursery, W. Hartford, Conn.; Gaumer Landscape Service, Warren, O.; The Haupt Tree Co., Sheffield, Mass.; Larry Holkenborg, Sandusky, O.; G. Bourne Knowles & Co., S. Dartmouth, Mass.; Dave Larned Tree Service, Cleveland, O.; Landscape Foresters, Ltd., Bronxville, N. Y.; Petrove Bros. Tree Service, St. Louis, Mo.; Parke-Speed Tree Service, Columbus, O.; Pfeifer-Murton Co., Cleveland, O.; Reardon's Tree & Landscape Service, Pembroke, Mass.; Schulhoff Arborist Service, Wheatridge Colo.; Suburban Tree Service, Manchester, Mo.; West Side Tree Service Co., Cleveland, O.

Tractors and Economics To Trade Or Not To Trade

Determining the proper time to trade in your tractor should be based largely on economics, says E. O. Beasley, extension engineering specialist at North Carolina State University.

Beasley recommends that a tractor be replaced when its accumulated average cost per hour of use is at its lowest point. (This can be figured by adding all ownership and operative costs of the tractor and dividing by the total number of hours it has been used.) As it is difficult to determine just when this will happen, he suggests keeping thorough records and doing some figuring ahead.

The accumulated average cost per hour usually decreases rap-

idly during the first few years and then begins to level out, says Beasley. When the cost per hour gets about as low as it will get, it probably is the time to trade the tractor before major repairs are needed, Beasley says. If the cost per hour of use increases one year, it probably should have been traded the year before.

Costs to be recorded include depreciation, interest on investment, shelter, taxes, insurance and repairs. Fuel, oil and labor costs should not be included in the tractor record but should be charged directly to the various implements with which the tractor is used.

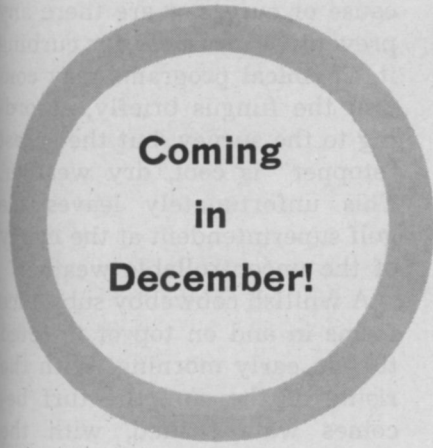
Actual depreciation will be about 38 percent of list price the first year of ownership and 6.5 percent of the remaining value

each year thereafter. Interest, shelter, taxes and insurance will amount to about 10 percent of the remaining value of a tractor each year.

It is not practical to estimate the average number of years a tractor should be kept, according to Beasley, as the "economic life" may vary from 8 to 15 years.

Also to be considered when determining when to trade in your tractor is the fact that an old tractor may not be suitable for new or increased operations that are being planned for the future. The need for greater versatility may make the old tractor obsolete.

"Judgment and experience are indispensable at times when a decision has to be made, but cost records are always helpful," Beasley concludes.



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Meeting Dates



Turf Conference, New York State Federation of Golf Course Superintendents, Nevele Country Club, Ellenville, N. Y., October 8-9.

Turfgrass Management Conference, Florida Turfgrass Association, Ramada Inn, Gainesville, Fla., Oct. 8-10.

Southern California Equipment and Materials Educational Exposition, City Park, Lynwood, Calif., Oct. 16-17.

Central Plains Turfgrass Conference, Central Plains Turfgrass Association, U S G A Green Section and Kansas State Univ., K-State Campus, Manhattan, Kan., Oct. 16-18.

Industrial Weed Control Conference, 3rd Annual, Texas A&M University, Memorial Student Center, College Station, Tex., Oct. 20-22.

Southern Fertilizer Conference, National Plant Food Institute, Mariott Motor Hotel, Atlanta, Ga., Oct. 23-25.

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.

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.

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 Agricultural and Environmental Science Campus, New Brunswick, N.J., Feb. 19-21.

HRI Study Reveals Scope of Nursery Industry

The American Association of Nurserymen's Horticultural Research Institute has made available, for the first time, information that measures the economic size and scope of the nursery industry.

A summary of the HRI project—entitled "Scope of the Nursery Industry"—contains data regarding all types of nursery businesses, from wholesale operations to landscape, mail order and garden centers. Figures presented include employment profiles, job classifications, payrolls, production acreage, chemical and equipment uses and business profiles of all types.

The study, for example, reveals that wholesale nursery growers spend over \$13 million annually on fertilizer and pest control chemicals: \$8 million on fertilizers, \$2 million on weed killers, \$2 million on insecticides and \$1 million on fungicides. Preliminary figures of the summary also indicate that retail nursery stock sales during 1966 amounted to over \$1.6 billion.

The entire "Scope" summary may be obtained by sending \$3 to: Horticultural Research Institute, 833 Southern Building, Washington, D. C. 20005. Copies are free to HRI members.

American Golf Courses Stricken with Blight

Pythium Blight—also known as "cottony blight"—is a grass-killing fungus that is causing fairways and greens of golf courses across the nation to be closed for repairs, according to a survey by the Golf Course Superintendents Association of America.

The disease is most aggressive in moisture-saturated atmospheres where temperatures range between 85° F and 95° F,

says GCSAA. It has no known cause or cure, nor are there any preventive measures for curbing it. Chemical programs may contain the fungus briefly, according to the survey, but the surest "stopper" is cool, dry weather. This unfortunately leaves the golf superintendent at the mercy of the uncontrollable weather.

A whitish cobwebby substance forms in and on top of infected turf in early morning. With the rising of the sun, the turf becomes water-soaked, with the darkened fungus giving off a greasy appearance. Later in the day the "web" disappears, and the infected leaves take on a tan to red color. In early infection periods, these spots run in streaks, following the surface drainage patterns of the links.

The most seriously damaged courses, the survey notes, are in the following areas: metropolitan St. Louis and the remainder of the crabgrass belt, ranging from Kansas City to Washington D. C.; the Columbus, Dayton, Cincinnati areas plus the Carolinas; central Illinois and central Indiana.

New Fertilizer Packet Regulated by Weather

Wisconsin's S & D Products, Inc. is now manufacturing the recently developed "Root Contact Paket," a slow-release fertilizer.

Improved plant survival, increased shoot growth and lower replacement costs are among the advantages of using the new packet fertilizer, says its developer, Professor O. J. Attoe, Soils Department, University of Wisconsin.

The packet is a heat-sealed, polyethylene-paper envelope containing specified quantities of water-soluble (16-8-16) fertilizer. Upon planting, the packet is placed unopened next to plant roots. Soil vapor enters micropore "pinholes" in the

packet's sides and slowly dissolves the fertilizer, which escapes in liquid form. The combination of slow release and minimal amounts of fertilizer delivered to a plant at any one time assures that fertilizer burn of root tendrils will not occur, Attoe says.

The packet's activity is largely controlled by the seasons, i.e. it operates through a timing mechanism triggered by vapor pressure in warm soil and halted when the soil is cold. Thus, fertilizer is not released during plants' dormant periods, according to Attoe.

The life of a two-ounce packet is usually about five years, he says. In warmer climates, however, it is reduced to about three.

Recommended for roses, potted plants, deciduous bushes, evergreens, shade and fruit trees, Root Contact Paket may be used in new plantings or with established plants.

For more information, write S & D Products, Inc., 216 S. Minnesota St., Prairie du Chien, Wis. 53821.

MSU Says Lawns Need Air Circulation and Nitrogen

A recent Michigan State University study has indicated that surrounding your lawn with a solid screen of trees and shrubs will increase lawn maintenance problems.

If air movement across a lawn is restricted, the grass may die from high temperatures. This results in a brown, weak turf incapable of resisting injury from insects, drought or disease.

Another MSU tip concerns the addition of nitrogen in developing a more lush lawn. Dr. Paul E. Rieke, MSU soil scientist, suggests guidelines for nitrogen application.

On Merion bluegrass and bentgrass receiving plenty of water, apply 6 to 8 lbs. of actual nitro-

gen annually per 1000 sq. ft. of turf. As no more than 2 lbs. of actual nitrogen should ever be applied at a time, divide this amount among 3 or 4 applications.

Use 8 lbs. of nitrogen annually on heavily watered, sandy soil; on low management turf, use 4 to 6 lbs.

On other Kentucky bluegrass, 3 to 4 lbs. per 1000 sq. ft. should be applied to turf getting lots of water; 2 to 3 lbs. for non-irrigated turf. For red fescues, only 1 to 3 lbs. should be applied per 1000 sq. ft.

MSU studies show that about 40% of your total fertilizer requirement should be applied in April and May, about 20% in June and July, and the remaining 40% in August and September.

The key to good lawn maintenance is getting an early start with fertilizer to help your grass get a jump on any weeds that may be present, says Rieke. It may be necessary to mow more often, making sure clippings are removed to avoid susceptibility to thatching.

If your lawn has come through the winter with a good stand and color, fertilize a little later in the spring, Rieke suggests. This will mean less mowing, less nitrogen, and fewer clippings to remove.

Booklet Illustrates Proper Chain Saw Usage

McCulloch Corporation is now offering a new, revised edition of its pocket-sized booklet, "CHAIN SAW OPERATION." Text and illustrations cover tree felling, bucking, limbing and firewood cutting plus wearing apparel and chain saw maintenance tips.

For a free copy, write the Public Relations Dept., McCulloch Corp., 6101 W. Century Blvd., Los Angeles, Calif. 90045.

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... your most productive, safest aerial platform for fastest, easiest tree service. Self-leveling bucket with one-hand, "3D" all-direction control enables one or two men to maneuver while operating tools.

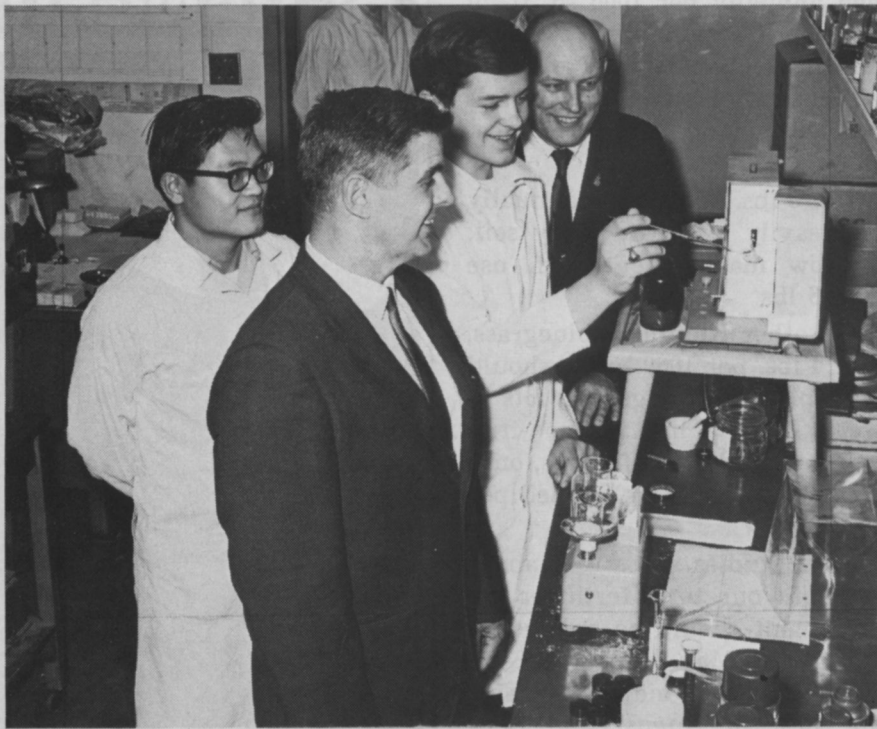
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Bob Hisey, Vo-Ag student at Marysville High, works on his research project in Scotts lab while onlookers Bob Yeh (left), of Taiwan and a Scotts staffer, Superintendent of Schools Leroy Williams (foreground) and Vo-Ag teacher Odell Miller "supervise."

Vo-Ag Students Earn While They Learn

Since 1964 Scotts Research, Marysville, Ohio, has been giving promising high schoolers the opportunity to try their hand at turf research. The teenagers — all Vo-Ag students at Marysville High — work half a day at Scotts, attend school a half day.

Seven students have completed or are presently working on the Agri-Business program, which helps the students gain a better understanding of scientific research and acquaints them with the functions and opportunities in agricultural business.

Vo-Ag teacher Odell Miller directs the Agri-Business program at the high school; researcher Eugene Mayer organizes the work assignments for the students at Scotts.

As an example of the work done by students, Robert Hisey works in herbicide development, studying bensulide for preemergence crabgrass control (prevents crabgrass seeds from germinating; whereas many

other crabgrass preventers kill the seedling crabgrass after being absorbed through the tiny roots).

Studies such as this give the agribusiness student a keen understanding of scientific research.

Pesticide Demand Grows with Consumer Incomes

Farmers use a lot of pesticides, says the U.S. Department of Agriculture, but so do other people.

According to USDA statistics, farmers purchase about 40 percent of all pesticides sold annually; about 20 percent are shipped abroad, and the remainder, a whopping 40 percent, are sold to non-farm outlets for use around the home and garden, business and industrial sites, highway and utility right-of-ways and recreational areas.

Although use of insecticides is likely to continue upward, it will do so at a slower rate than that of herbicides, USDA reports. Because modern herbicides have a more recent history of technological development and acceptance,

the use of herbicides continues to expand dramatically.

In contrast, demand for insecticides responds more to growth of population and consumer income than to discovery of new material and changing technologies. For example, some arsenicals—still effective today—have been used since before the turn of the century. The use of newly developed systemic insecticides will probably increase, says USDA, but this is likely to be offset by a decline in the use of other insecticides.

New Fylking Puts Hex on Artificial Grasses

A new rival to artificial lawn carpeting is the perennial Kentucky bluegrass named Fylking. Possessing the advantages of artificial grass, it also offers the fresh, hygienic cover that only a living sod can provide.

Overcoming several deficiencies of fine lawngrasses, Fylking thrives at a close mowing height of an inch or less and resists diseases such as leafspot and stripe smut. Therefore, it not only adapts to baseball fields and golf course tees and fairways, but it retains its healthy, unblemished color from early spring until late autumn. Not even drought can harm this sturdy grass.

Indeed, Fylking seems to put a hex on artificial grass that is neither self-renewing nor as healthful as a select bluegrass.

Voracious Snail May Help Control Fresh-Water Weeds

A large, weed-eating snail may help solve some weed problems in fresh-water ponds, lakes and streams, according to the U. S. Department of Agriculture.

Researchers at the University of Miami, Fla., under government contract, will determine the physiological and environmental factors that influence re-

production of the snail *Marisa cornuarietis*.

A hardy snail, *Marisa* eats the eggs of other disease-carrying snails but carries no disease of man itself.

The Florida research is designed to develop techniques for the mass rearing of the snails and to determine means of shipping them economically to weed-infested ponds and lakes. Various types of *Marisa* will be collected from Florida, Puerto Rico, the Caribbean and South America, the most promising of which will be selected for the task of helping clear water weeds.

Grace & Co. Publishes 1968 Product Guide

W. R. Grace & Co. has recently published a 112-page edition of its Product Guide as an aid to those wishing to purchase their products or services. For a copy write their Information Services, PR Div., 3 Hanover Square, New York, N.Y. 10004.



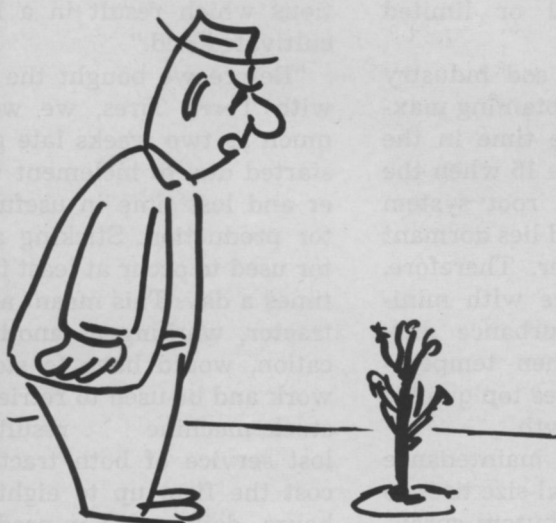
New polyethylene-lined burlap bag is examined by, left to right: Gordon Jones, Hubbard Seed and Supply Co., Hubbard, Ore., Frank Buck, certified grower of Highlight Chewings fescue, Woodburn, Ore., and Dick Bailey, W. R. Grace and Co., Rudy-Patrick Seed Div., Halsey, Ore. Bag has polyethylene inner liner which maintains viability of seed by slowing rate of moisture change.

Packed in Poly Bags New Chewings Fescue

Highlight — the first certified Chewings fescue available in the United States — is now moving into trade channels, according to Dick Bailey, Halsey, Ore., the man in charge of seed production for W. R. Grace & Co., Rudy-Patrick Seed Division.

A Dutch variety that has been in the development stage for over 15 years, Highlight is a disease-resistant, winter-hardy variety that maintains a dark-green color, says Bailey.

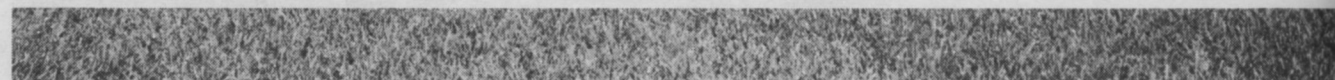
The new fescue performs well in either mixtures or alone, in sunshine or shade, according to Bailey. A long-lived perennial, Highlight has erect growth habits and forms a dense sod in a wide range of soil conditions.



"HURRY UP AND GROW. I'D LIKE TO SEE YOU GROW UP IN MY LIFE. TIME, NOT YOURS."



SOD INDUSTRY SECTION



Using the low-slung JD300 turf tractor with terra tires, Harold Gunn has eliminated wet weather ground problems. Result is better quality, fast growing sod plus savings in labor.

High Flotation Tires Solve Problems At New Jersey Blue Grass Lawn Farms

Wet weather and soggy ground conditions have always plagued turf growers during the critical growth period between March 15 and June 15. Harold Gunn, co-owner of Blue Grass Lawn Farms, Vincentown, New Jersey, has solved these problems. In doing so he's growing a better quality, faster-growing sod; saving 12,000 yards of sod a year; saving eight man-hours of labor a day; fertilizing 60 more acres a day; mowing 53 acres a day more; and upped spraying production by eight acres a day. How? Gunn is using a combination of low-slung John Deere Model JD300 Turf Tractor and nearly four-foot-wide (44x41:00-16A) Goodyear Terra Tires which give greater flotation, permitting work during weather

and ground conditions that heretofore stopped or limited production.

Common in the sod industry is the problem of obtaining maximum maintenance time in the 90 days before June 15 when the seed is building a root system and plant body. Sod lies dormant during hot weather. Therefore, proper maintenance with minimum ground disturbance during the spring when temperatures are low insures top quality sod and faster growth.

"Using heavier maintenance tractors with normal-size tires to pull fertilizer distributors, sprayers, and mowers usually results in lost time," says Gunn. "Tractors bog down or can't work at all because of wet-weather ground conditions. Added to

this, normal tires cause indentations which result in a loss of cultivated sod."

"Before we bought the JD300 with Terra Tires, we were as much as two weeks late getting started due to inclement weather and lost time in useful tractor production. Sticking a tractor used to occur at least three times a day. This meant another tractor, working at another location, would have to stop its work and be used to retrieve the stuck machine . . . resulting in lost service of both tractors. It cost the firm up to eight man-hours daily of non-productive time to retrieve disabled equipment. During a season that amounted to over 12,000 yards of sod."

Gunn tried to solve the prob-



Much of the acreage of sod at Blue Grass Lawn Farms is under water following a heavy rain. Even though ground is wet, mowing is seldom a problem with the wide rubber tire type of equipment.

lem by fabricating 48-inch wide by 48-inch diameter steel wheels. The steel wheels had the needed flotation, but little traction over the wet slick ground or during mowing operations. Gunn mows every other day.

Since adopting the new equipment combination, Gunn claims his company has encountered no wet-weather problems or no loss of sod, and work that required three men and three tractors can now be done with two tractors.

"An increase of over 53 acres of mowing a day has been accomplished," says Gunn. "In addition, the spraying operation has been increased by eight acres daily and fertilizing time has been cut from 10 to 12 days to five and six. That's a fertilizing production increase of 60 acres a day."

Gunn explained that many turf growers have to resort to use of helicopters for spraying in order to fertilize sufficiently during the growing period. "We



With early spring sod care problems solved, cutting and rolling good sod is relatively simple, according to Gunn. Sod is cut 16" x 84" with Ryan cutter and rolled with Ryan roller.



Terra tires present no problem when pulling 200-gallon sprayer used by Gunn. Small steel wheels were custom fabricated.



Up to eight tons of fertilizer can be hauled in this Wilmar spreader and handled without compaction or danger of sticking.

even fertilize in the rain," says Gunn. "The fertilizer works faster when mixed with water."

Innovation is not new to the operators of Blue Grass Farms. Harold, Jack, and Owen Gunn, co-founders of the 20-year-old firm, were the first to introduce mass-produced bluegrass sod in New Jersey. They're considered among the leading producers of top-quality Merion bluegrass in the area. The Gunns were the first in New Jersey to cut and deliver sod in rolls of about one square yard (16x84 inches) which reduced the time factor and labor costs for landscapers. They presently operate over 735 acres, cultivating Merion and Merion-Kentucky bluegrass sod.

Warren's Develops Hardy, New Bluegrasses

Warren's Turf Nursery, Goshen, N. Y., has been conducting research on bluegrasses for several years at its national headquarters in Palos Park, Ill.

Warren's Shade Bluegrass (A-34), tested under varying conditions, will tolerate up to 65 per cent shade, says the company. Its similarity to Merion (not shade-tolerant) makes it an ideal grass to plant in partially shaded areas of lawns where

Merion or Kentucky bluegrass is used in sunny areas.

A bluegrass designated "A-20" has proved to be resistant to rust, mildew, smut and leafspot, says Warren's. It makes a dense, dark green turf but does not develop thatch as readily as most bluegrass due to its upright growth characteristics.

Warren's A-10 Bluegrass, tested in hot, humid climates where Kentucky bluegrasses do not usually grow well, has indicated a temperature adaptability range from -20°F to $+100^{\circ}\text{F}$, reports Warren's. It retains a dark green color throughout the growing season.

Two other new bluegrasses—A-25 and A-26—do well with a mowing height of only $\frac{1}{4}$ inch and can be used ideally for home-putting greens, croquet courts and other play areas, according to the company.

Tour Stimulates Interest in Bluegrass Production

W. J. Walden, Kentucky's major producer of Bluegrass, recently hosted a "Bluegrass tour" of his farm at Midway, Ky., designed to stimulate interest in

Bluegrass seed and sod production.

Sponsored by the Kentucky Seed Improvement Assn., the Kentucky Department of Agriculture and the Cooperative Extension Service, the tour was attended by some 75 farmers, agronomists, county agents and state officials.

Of particular interest during the tour were the new stripper-loader unit that enables two men to do the work of 28 and the one-man sod cutter that can cut sod as fast as an operator can walk. These machines helped demonstrate how sod production—at low expense and with minimum labor—can earn \$350 or more per acre, according to Walden's reports.

Walden claims that Bluegrass grown from seed of Kentucky origin has proved superior in performance. Despite this fact, however, of the 40 million pounds of seed marked and sold as Kentucky Bluegrass last year, only 184 thousand pounds were produced in Kentucky, says Walden. Since 1960, he explains, foreign importation and competitive production of seed in northwestern states have resulted in a drastic decline in the production of Kentucky Bluegrass seed.

There's More Than One Way To Skin a Bug, Says Koval

Chemicals will probably always be used for insect control, according to Charles Koval, University of Wisconsin Extension insect control specialist, but in more refined techniques and in forms other than presently known insecticide sprays.

For example, use of attractants — food, habitat or sex or a combination of these — that draw insects from large areas into traps may replace insecticides, he says.

Artificial foods, substituted for natural foods, can be treated with non-toxic insecticides to kill insects drawn to a trap.

Habitat ammonia bait draws flies to a jar where they proceed to lay their eggs. In this manner millions of eggs can be destroyed, thus greatly reducing the popu-

lation of the next fly generation.

An example of using sex attractants can be seen in peach borer control. One female borer in a trap draws large numbers of males within a half-mile radius into the trap, says Koval. With the development of synthetic materials to replace live females as the attractant, this will be one of the cheapest insect control methods available, he predicts.

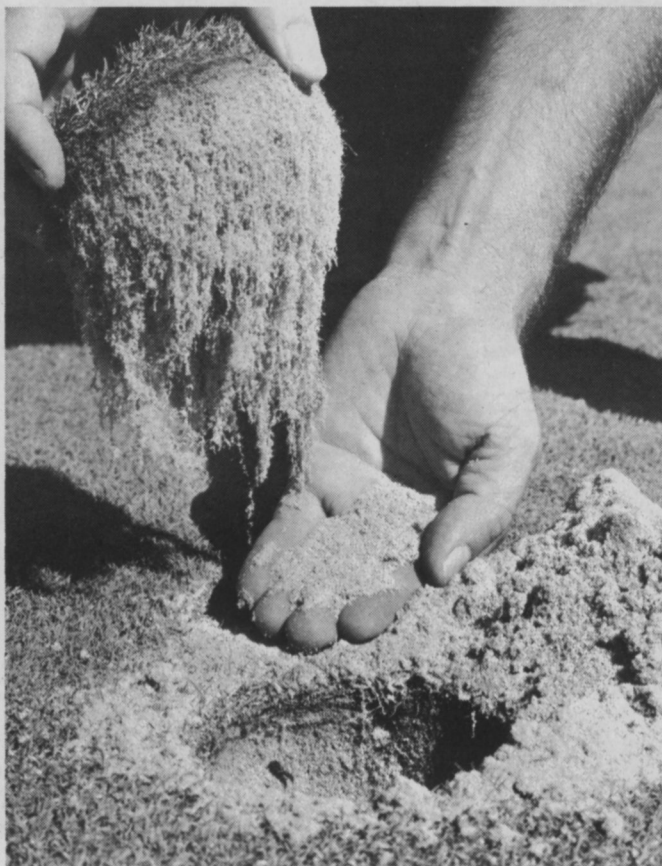
Sound waves can also be used to kill insects that would be difficult to control with other methods, especially those species in stored grain, says Koval. The frequency does the killing, not the volume.

Development of new plant varieties offers another method of insect control. Some plants "taste bad" to insects and others prevent young insects from developing. The ginkgo tree is an

insect-resistant plant virtually free of insect attacks, according to Koval.

Another method of control is to use systemic insecticides, which prevent a buildup of insect populations so that the situation never gets out of control, according to Koval. These insecticides are absorbed through plant roots and kill insects feeding on the plants. They produce no surface residue or wind drift to damage other crops and do not persist in soil, Koval points out.

A simple and cheap means of insect control for most homeowners is the washing method. A high-pressure stream of water from a garden hose knocks insects off shrubs and bushes, removing them from their food source and upsetting their life cycle so that they die, Koval said.

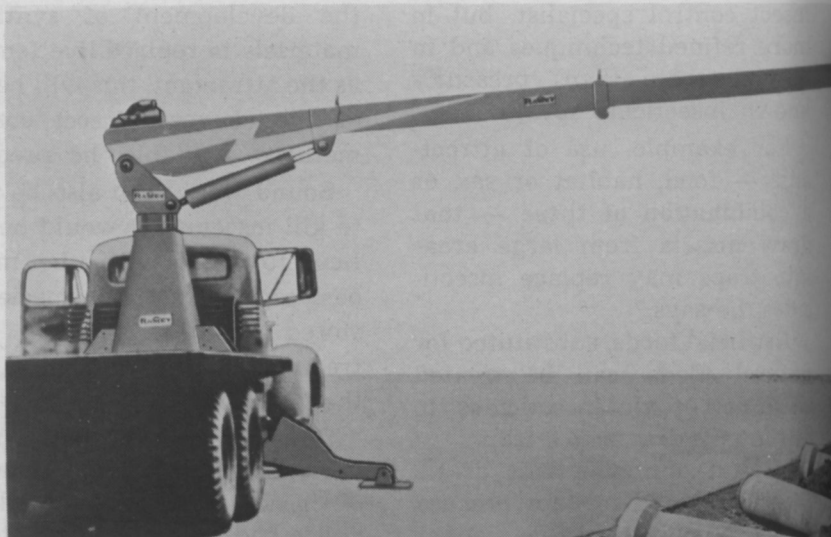


Plastic sheets buried 20 inches below ground level save moisture for golf green turf. Dr. W. H. Daniel, above, Purdue University turf specialist, examines core of turf-topped sand from test golf green. Plastic laid beneath ground surface serves as a "stopper" for moisture. Daniel says this is similar to the old kerosene lamp idea. The plastic barrier serves as the container, and water rather than kerosene seeps up through the sand which is the wick and helps maintain a healthy turf. Coarseness and depth of sand can be varied, according to Daniel. He finds that turf stays moist and green longer, needs less water, and develops deep roots. Also, the turf wears well. He suggests the barrier may be equally practical on athletic fields.

New Products . . .

Designed for the Vegetation Control Industry

New addition to the line manufactured by Ramey Hydraulic Loaders, Roseburg, Ore., is the telescoping straight boom model called the "INVINCIBLE" 1-145. Truck-mounted for maximum portability to any jobsite, the new loader boasts a rated lifting capacity of 10,000 lbs., according to Ramey. Boom sections are entirely of high tensile steel; maximum horizontal reach is 36 feet, vertical reach is slightly over 46 feet. Dual-side controls allow the operator to function from either side of the unit. The full 370° swing and extra-wide outrigger spread add to the loader's versatility. The unit is currently being used in water and sewage works construction, bridge maintenance, sign erection, pipe laying, home building and railway and truck unloading, according to the company. For more details circle (701) on reply card.



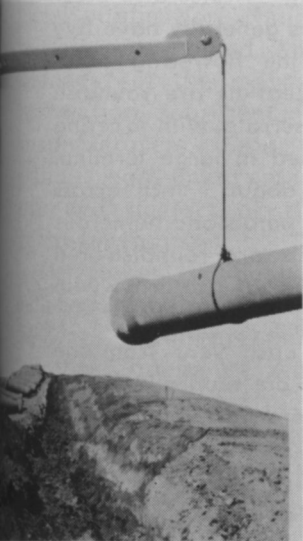
Rite Hardware of Glendale, Calif., has added a disposable, air-supported hood to its Whitecap line. Ideal for situations requiring respiratory safety but not necessarily hard-hat protection, says the manufacturer. The durable, polyethylene hood assures an airtight fit, has Mylar faceplate bonded in front for wide, clear vision. Snug-fitting, reinforced vinyl vest resists most solvents and chemicals. For more details circle (702) on reply card.



◆ Slope Tractor Co., Harper, Kans., recently introduced its Slope Runner model, a tractor-mower that can operate on steep embankments without overturning. The rugged unit features hydraulic sloping controls that provide for maximum safety. By simply adjusting a lever, the operator can adjust the wheels and mower assembly to side slopes up to 30 degrees. As the unit "leans" into an incline, the mower, positioned beneath the tractor and mounted from the rear axle, automatically follows the inclination of the axle and assures the operator that the mower blade is parallel to the surface being mowed, says Slope Tractor. Eight forward, two reverse speeds range from 1 to 20 miles per hour. Attachments available include: posthole digger, rear trencher, grader blade, grass seeder, sprayer, front-mounted broom and flail- and sickle-type mowers. For more details circle (703) on reply card.

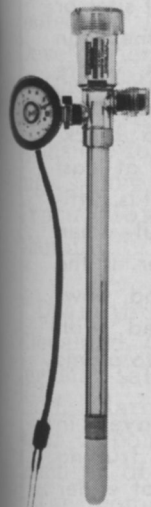


Smithco, Inc., Wayne, Pa., has introduced two separate Two-Wheel Vehicle Trailers designed especially for large carrying capacities required by golf courses and parks. Available in 16 or 23 cu. ft. capacities, the units are equipped with ramp-type tail gates for easy loading and hitches that fit most mobile carriers. A "train" of these trailers can be delivered to various locations in the morning, then can be picked up individually throughout the day. This, says Smithco, permits the driving unit to provide other functions while trailers are being loaded by personnel. For more details circle (704) on reply card.



A new TH model series of Goebel Scissors Hoists can be installed on any straight truck with a 1 to 2 1/2-ton chassis. Goebel's dashboard-controlled hydraulic system enables a driver to deposit any load up to 13 tons in just 20 seconds... without having to leave the cab, says Summers Mfg. Co., Maddox, N.D. Goebel's 45° dumping angle ordinarily requires no manual clean out. For more details circle (705) on reply card.

Rain Bird Mfg. Corp., Glendora, Calif., is now marketing a moisture-sensing device that "tells" an automatic sprinkler controller when water is needed in the soil. Called an "Irrrometer," the device can reduce the amount of water used in automatic irrigation by as much as half, says Rain Bird. For more details circle (707) on reply card.



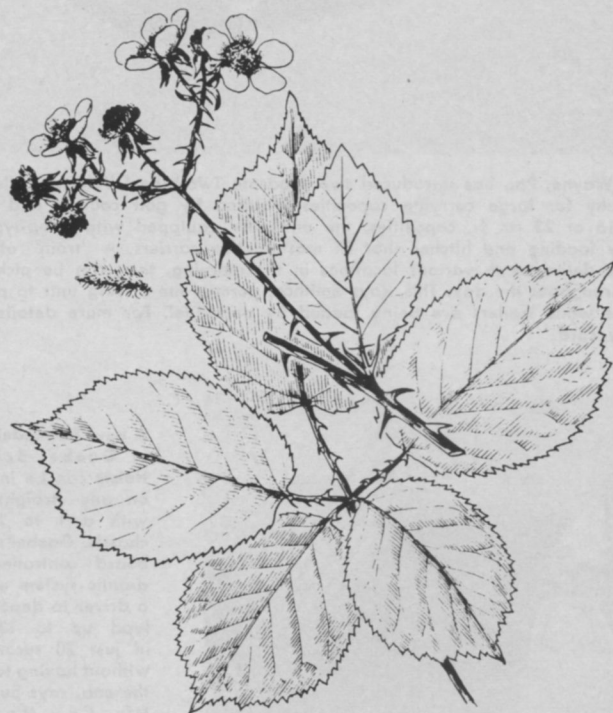
Asplundh Tree Expert Co., Jenkintown, Pa., has developed a combination tree wound dressing/sprout growth inhibitor that is packaged in an all-weather operational aerosol. Asplundh Inhibitor-Fortified Tree Paint can be effectively applied at any time during the year. For more details circle (708) on reply card.



Ryan Equipment Co. has made available Ren-O-Thin, a new rental thatch-cutting and turf-renovating machine that limits user-adjustments to merely raising or lowering the cutting blades. The unit incorporates the design and construction of the institutional Ren-O-Thin but has eliminated the clutch and throttle for more maintenance-free operation in the rental market, says Ryan. Quick-change flail reels reduce costly down-time. For more details circle (706) on reply card.

HIMALAYA BLACKBERRY

(*Rubus procerus*)



Drawing from: Vascular Plants of the Pacific Northwest, Part 3, by C. L. Hitchcock et al.

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

There are many species of blackberry (all in the genus *Rubus* in the Rose Family), but the specific one referred to here is the Himalaya blackberry (*R. procerus*). Native to Europe and parts of Asia and North Africa and now widely spread throughout the world, it has escaped from cultivation and become a serious weed problem in this country—especially along the Pacific Coast. What appears to be the same plant, but given a different specific name (*R. fruticosus*), escaped from cultivation in Australia and New Zealand, where it is considered a noxious weed. It is sometimes said that the western side of New Zealand's South Island has only one blackberry bush, but that bush is 100 miles long.

Himalaya blackberry is a sprawling evergreen bush that may reach a height of 10 feet, with trailing stems up to 20 feet long. The stems or canes vary from green to reddish-purple in color and have numerous hooked or straight thorns or prickles from $\frac{1}{8}$ to $\frac{1}{2}$ -inch long. Prickles also occur on the leaf petioles. The leaves generally have five leaflets, although those on the flowering canes sometimes have only three. Leaflets are roundish to oblong, 4 to 5 inches long, serrate, with tapering apices. The flowers are formed in large terminal panicles, each flower being about 1 inch across and having five white or pink petals and numerous stamens and pistils. The fruits are roundish—red when young and shiny black at maturity—with large, succulent drupelets.

New canes are produced each year from the crown, replacing those which die naturally within a few years time. New plants are started by rooting from the tips of parent plants as well as by seeds that germinate in the fall or spring. These seeds, however, generally will not survive unless they happen to fall on bare ground or where moisture conditions remain good. If they do survive their first year they become vigorous, especially in moist areas. It is noteworthy that although Himalaya blackberries are most troublesome in moist sites or along ditches containing flowing water, they can also occur on the margins of such areas, where they are on dry ground in the summer.

The first step in controlling Himalaya blackberries is to drain the land, if possible, or at least to attempt to improve the drainage. Control is difficult—and in many cases totally unsuccessful—when the plants are allowed to remain in water. If the veins are growing on banks or on dry land, however, effective control can be achieved with persistence; the following discussion refers to plants growing under these conditions.

The plants should be thoroughly sprayed in June or July while in the flowering or fruiting stage of growth. Picloram or ester forms of either 2,4,5-T or silvex are effective sprays. Burning the dead canes in November or later, when burning conditions are good, will greatly aid in treatment of the regrowth. The sprouts should then be sprayed the following June or July, after they have become well established. Some retreatment the third year may be required to achieve complete control.

Of the herbicides mentioned, picloram is the most effective, as a relatively high degree of control may be attained after a single application (when the plants are not standing in wet ground). However, hazards involved in its use are important considerations, and as a consequence 2,4,5-T and silvex are currently in more common usage.

Suppliers' Changes

The National Fertilizer Solutions Assn., Peoria, Ill., announced two personnel changes. Richard L. Gilliland was named Editor of Fertilizer SOLUTIONS Magazines, the association's official publication. Nancy Chamberlain was named Advertising Manager of the magazine. The association represents chemical manufacturers, major oil companies, equipment manufacturers and dealers of the liquid fertilizer industry.

Dr. Robert J. Schramm, Jr., has been appointed associate professor of ornamental horticulture in the College of Agriculture plant science department at the University of Connecticut.

E. J. Lott, Purdue University extension forester, is the new secretary-treasurer of the Indiana Hardwood Lumbermen's Association.

Victor P. Moore has been promoted to Manager, Manpower Development of the Agricultural Chemicals Division of Geigy Chemical Corp. He will be responsible for management training, salary administration, job evaluation and organization planning.

Diamond Shamrock Corp., Cleveland, O., has established a regional sales office in Fresno, Calif. Harold A. Branson has been appointed regional sales manager of the new office.

The company has also appointed Charles L. Troph as manager-market analysis and planning for the Agricultural Chemicals Division and Ronald L. Dezember as product manager for the Division. Succeeding Dezember as agricultural sales specialist in the Ohio area is Roger E. Gilmore.

Elanco Products Company, Indianapolis, has announced that Robert B. Love, John W. Garrett and David E. Smith have joined the company as agricultural

chemicals sales representatives.

John R. McCloud has been named Area Manager for Nutro Turf & Garden Products, Borden, Inc., Chemical Division, which markets the NUTRO line of plant foods for home and garden use and Greens & Fairways Turf Foods for institutional and golf course use.

Melvin C. Tucker, Director of the Division of Plant Industry of the Arkansas State Plant Board, has been elected Chairman of the Southern Plant Board. Vice-chairman is Halwin L. Jones of Florida; Secretary-Treasurer is Carl M. Scott, Jr. of Georgia.

California's Rain Bird Sprinkler Mfg. Corp. has named Jimmie Blackledge their Florida Sales representative.

The Eastern Chapter of the National Agricultural Advertising and Marketing Assn. recently elected Raymond E. Evans a Director for a two-year term. Mr. Evans is Advertising Supervisor of the Agricultural Chemicals Division, Amchem Products, Inc., Ambler, Pa.

The University of Delaware's Cooperative Extension Service has announced two staff changes: Frank E. Boys will assume the duties of extension entomologist Donald MacCreary, who recently retired; replacing Boys as agricultural chemicals specialist is John S. McDaniel, who has been in the agribusiness community since 1950.

The university's College of Agricultural Sciences announced its establishment of two new departments. The department of agricultural engineering, to be headed by professor Ernest N. Scarborough, will deal with engineering problems involved in the production, processing and handling of food and fiber; the department of plant science,

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with Dr. Merle R. Teel, chairman, and Dr. Wayne Kussow, will increase coordination in teaching, research and extension programs in plant pathology, agronomy and horticulture.

Neil R. Mitchell has been appointed Assistant General Counsel for Velsicol Chemical Corporation, Chicago. Mr. Mitchell recently returned from Brussels, Belgium, where he had served as staff attorney for the European area for Dow Corning Corporation.

Ralph P. Mickow has been promoted from General Credit Manager to Director of Distribution for Velsicol. Mr. Mickow will now be responsible for the handling and distribution of all Velsicol products in the United States and 70 foreign countries.

Thompson-Hayward Chemical Co., Kansas City, Kan., has designated R. Shaw Fletcher agricultural technical sales representative of its Planter's Chemical Division at the Americus, Ga., branch office.

Thomas J. White has been appointed Manager of American Cyanamid Co.'s (Princeton, N. J.) newly created Pesticide Department. Reporting to Mr. White will be Pesticide Dept. Sales Manager, Morton McDonald, plus Product Managers A. R. Hoagland, E. B. Potter and N. D. Tankersley.

Trimmings

Research Impressive. Spent an enlightening day recently at Marysville, O., with Dick Bangs, who is an agronomist at Scotts. This visit was a first for me and the Scotts research program is far greater than I anticipated. Was especially impressed with their shade studies which encompass trials among forest type trees with varying degrees of sunlight. Their turf studies and fertilizer plots are extensive as expected but they also have some new basic research which will prove helpful in the industry. And if anyone is at all skeptical, that Windsor sod on concrete continues to thrive after three years. It receives Scotts Turf Builder and water as needed and looks better than anything around.

* * *

A Real Pro. Met Tom Graham this month for the first time and found that he lives up to his reputation as a professional sprayman. He is a veteran pest control operator who started a new business in contract application some 20 years ago and has become one of the foremost in the business with his Industrial Weed Control Company, as well as maintaining his PC business. His contracts with industry are extensive and his record for maintaining capable, experienced and loyal employees is hard to beat. He has a profit-sharing plan patterned somewhat after that of Sears and his people get the job done. He is moving rapidly into aquatic weed control because of need and demand and foresees a big increase for this phase of weed control. We'll have a complete story shortly.

* * *

Note for Bird Watchers. If a noted ornithologist is right in his belief that half the bird population has to die each year or serious overpopulation results, then we can quit worrying about the few which might be killed by chemical spraying. We read this heretofore unknown facet of birdlife with special interest, and in almost the same week, the fact that Ohio farmers alone suffer \$15 million yearly in crop damage from blackbirds. Changing land-use patterns by the citizenry is the greatest hazard to our birds, again quoting the same ornithologist.

* * *

Licensing For Spraymen. About 35 states now require that spraymen be licensed and this proves to be extremely important to contract applicators who cross state lines as

business demands. We are putting together a round-up of state requirements for benefit of applicators and will feature it shortly. This past week, I spent the day with Freeman E. Biery, state regulatory agent in charge of the Kansas noxious weed program. He is typical of the state regulatory agency personnel who regularly appear before state legislatures to help guide and keep in perspective the constant demands for restrictive legislation regarding weed control. The scope of such activities is impressive and Kansas spraymen are fortunate to have a man of Biery's capabilities at this level of state government.

Insect Report

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

Turf Insects

CHINCH BUG

(*Blissus leucopterus*)

Alabama: Heavy, damaged 2 St. Augustine grass lawns in Montgomery and Dallas Counties. **New York:** Still active in Nassau County lawns; bentgrass most affected.

LYGAEID BUGS

(*Blissus hirtus*)

Pennsylvania: Moderate to heavy in lawns of housing development in Venango County; problem past few years.

(*Nysius* sp.)

Nevada: Migrating from vacant lots and rangelands into yards and buildings in Washoe and Douglas Counties.

GRASSHOPPERS

Illinois: Abundant in some roadsides, ditches, fencerows, and grass waterways. Some migration into corn, soybeans, and hay.

TWO-LINED SPITTLEBUG

(*Prosapia bicincta*)

South Carolina: Adults unusually numerous in Clemson area. Yellowing appearing and heavy damage imminent. Damaged 3 acres of Coastal Bermuda grass.

Insects of Ornamentals

ARMORED SCALES

Florida: *Fiorinia theae* found severe on all of 1,300 Chinese holly plants at Leesburg, Lake County, August 14. *Pseudanidia clavigera* found severe August 16 on 700 of 876 camellia plants at Springhead, Hillsborough County.

Tree Insects

COOLEY SPRUCE GALL APHID

(*Adelges Cooleyi*)

Wyoming: Heavy on Colorado spruce at Laramie, Albany County; emergence of early August continues.

SOUTHERN PINE BEETLE

(*Dendroctonus frontalis*)

Virginia: No increase in beetle activity evident except in Mecklenburg County where 6 new infestations reported during July.

A LEAFHOPPER

(*Japananus hyalinus*)

Oregon: Late instars and adults common on ornamental maple at Corvallis, Benton County. Previously recorded in State from Portland only. This is a new county record.

LOCUST LEAF MINER

(*Xenochalepus dorsalis*)

Virginia: Moderate to heavy on locust trees in Montgomery, Roanoke, Botetourt, Bedford, and Campbell Counties.

GELECHIID MOTHS

(*Exoteleia nepheos*)

Michigan: Collected at Jenison, Ottawa County, for third known infestation in State. Noted at West Olive, Ottawa County, this summer and at Bellville, Wayne County, in 1966.

(*Recurvaria* sp.)

Minnesota: Heavily infested many spruce trees in home plantings and some in nurseries.

AN ARMORED SCALE

(*Fiorinia externa*)

Maryland: Found on hemlock planting near Chestertown, Kent County, August 19, 1968. This is a new county record.

FALL WEBWORM

(*Hyphantria cunea*)

New Mexico: Minor problem on shade trees at Santa Fe, Santa Fe County. **Wisconsin:** Caused slight damage to variety of trees in several counties. **Ohio:** Webbing common through central to eastern counties. Defoliation of various deciduous trees heavy this year. Larval numbers appear near seasonal peak.

ASIATIC OAK WEEVIL

(*Cyrtopistomus castaneus*)

Arkansas: Collected on trees and shrubs in Garland County July 22 for new State record. **Alabama:** Adults heavy and annoying about houses in Cleburne County; no damage to trees or shrubs.

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.

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