

# WEEDS TREES and TURF

APRIL, 1968

## Irrigation Issue

Calabasas Course Installation

Irrigation Roundup

Tree Planting Review



Monthly magazine of methods, chemicals and equipment for vegetation maintenance and control

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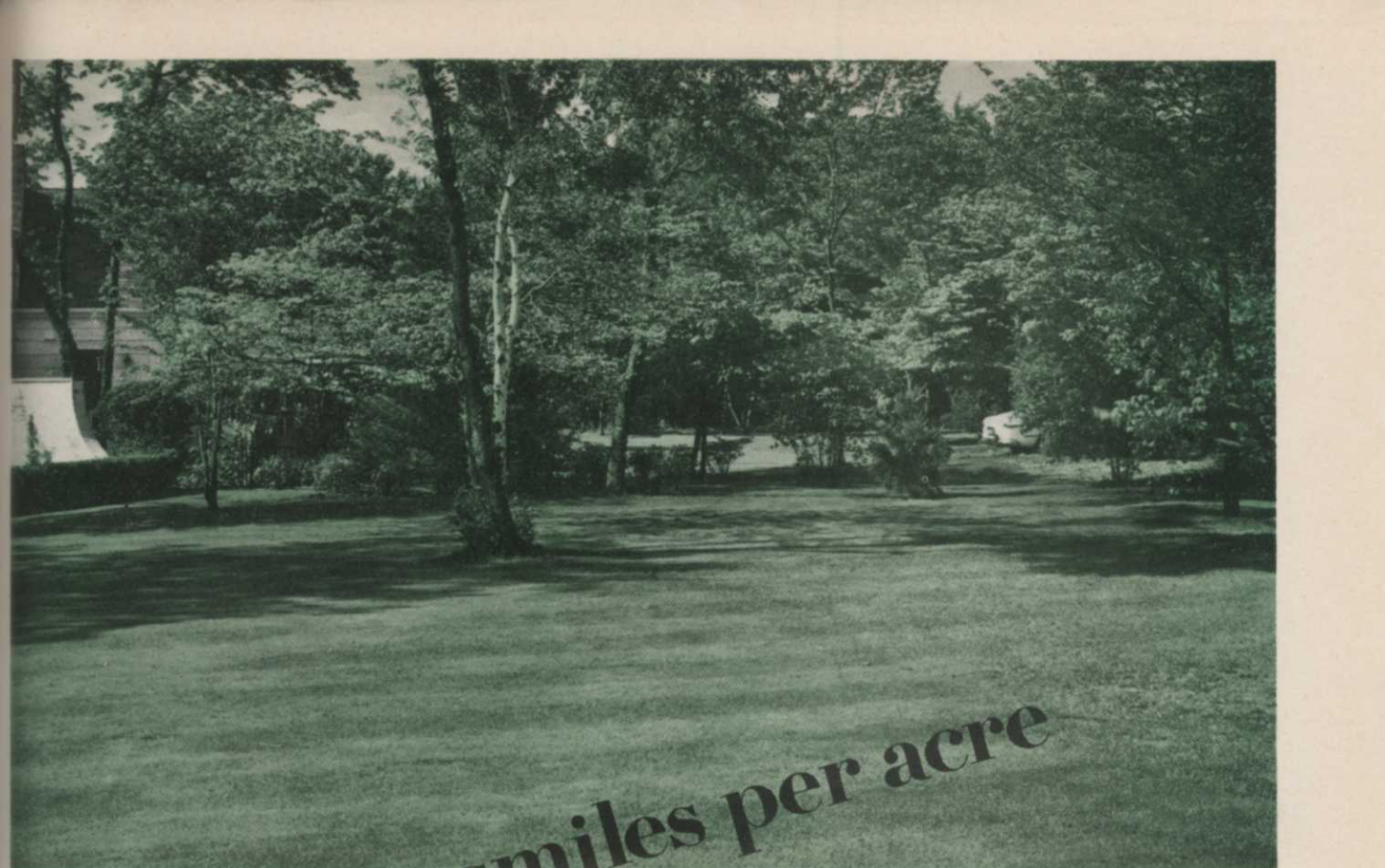
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## The Cover

Irrigation installation at new Calabasas Golf Course in Southern California was integral part of design of this \$350,000 course. Automatic irrigation system is capable of irrigating entire 150-acre course within a 10-hour period. (See story on page 8).

## WTT Mailbox

### We are Honored

I am most impressed with your magazine. It is in my opinion, one of the best I have read relative to the horticultural field. The articles are clear and well written and the illustrations are excellent . . . inasmuch as I work with a cross-section of people in the country, a great many see and read your magazine. A magazine of value, such as WEEDS TREES AND TURF, is not made available everyday . . . and when one does appear on the market I feel people should be made aware of it.

Lawrence D. Stouse

Extension Horticultural Agent  
Johnson County, Kansas

### Thank You Mrs. Ensor

We certainly have received many favorable comments on the fine article you wrote on Green Valley Turf in the February issue of WEEDS TREES AND TURF. The cover picture is very beautiful and a very true color. The rest of the photography is excellent and very descriptive. We have had many inquiries and wonder if you could send us extra copies.

Mrs. K. C. Ensor

Green Valley Turf Co.  
Littleton, Colorado

### Certainly Sir

I was pleased to note the feature story on one of our members, the Smith Tree and Landscape Service, Lansing, Mich. . . . if possible, I would like to borrow the photos for our monthly newsletter . . .

Harry J. Lambeth

Executive Director  
Associated Landscape Contractors  
of America, Inc.

# WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

April 1968  
Volume 7, No. 4

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**Credibility Gap?**

Pesticide use continues to grow. We are in a period when the well-being of society depends on chemicals, both for food and non-crop uses. Yet public opinion is largely suspicious of the pesticide industry. Society generally believes a credibility gap exists in statements made to allay the fears of chemical use. More legislation and government regulations are demanded.

Yet pesticides today are efficient. Used according to label instructions, they constitute little hazard. Recommended rates coupled with safe handling can help improve the public attitude. But this is not enough.

More stringent methods are required. Manufacturers and formulators cannot be expected to bear the entire cost of a public relations program to educate the public. This is a job which requires effort by everyone in the industry. Every employee, regardless of his place in the peck order, must be made aware of the need to develop public understanding.

Employers can start this trend first by a company safety program. Safe storage and careful labeling of chemicals is a major step. Wall posters, placards which promote safe handling, and regular safety instructions to employees can prove helpful.

More important, however, is training of employees who either handle or use chemicals. They must understand the product, and its effect on either vegetation or insects. And they must know its effect on people. In the event of accident, they must know precisely how to administer first aid.

Employers, however, must extend their influence well beyond company personnel if the public attitude toward pesticides is to be improved. Of major importance is regular contact with local news people. Spray operators can do much to sell the value of chemicals in roadside beautification, clearing inland water, preserving street trees, and a myriad of other benefits which the public enjoys daily. These same operators are also in a position to point out that only pesticides found to be safe by careful research and registered for use by government are ever used.

Another step for employers will be active community participation in civic programs. Guest speakers who can discuss methods for improving city parks and highways are always in demand. Spray operators are fully capable of selling their industry. They must devote some time and real effort in this direction.

Society needs the information and the industry stands to benefit from greater public understanding.

# Open Burning Vs. Pollution

By William H. Bartles

W. H. Bartles Tree Service  
Hyde Park, New York

Open burning of any kind is now prohibited in New York State. The state has passed an Anti Air Pollution ordinance which is being enforced.

At present, Municipalities are generally allowed to open burn on their respective dumps on a daily basis. However, they must cover the burned refuse with earth each day. This is a costly method of solid waste disposal. I can see it for garbage and general refuse, but not for leaves, wood, or brush.

Government constantly seeks to improve the living conditions of everyone. In my present position as Majority Leader of the Dutchess County Board of Representatives, and in past public positions, I, along with my colleagues who also serve, recognize this fact. But we are also aware that there has to be a point where simple economics must be reckoned with. Our goal is to eliminate air pollution insofar as possible. At the same time we cannot agree to a major expenditure of money and effort which does very little to create clean air.

As an operator of a tree service business, I face rising costs. These costs must be passed on to the customer. Removing wood and brush other than by burning when working in rural areas and along utility rights-of-way is very costly. It means that we must charge the utility companies more for the work. They in turn must pass this extra cost on to customers. Customers continue to pay more and more for the goods and services they buy.

Elm trees along highways and on private property are a major concern at this time. Eliminating burning in New York State has both raised the handling cost of these, and has contributed to the spread of Dutch elm disease. Wood which was formerly burned is now left along rights-of-way or relegated to a Town dump where it becomes a prime breeding place for the carrier of this disease, the elm bark beetle.

Accumulations of leaves on home lawns presents a removal cost. It is fine to suggest that they be used for compost heaps, but few town residents know how to handle these. Nor do they need them. If the Town removes leaves, operation costs of Town maintenance increase. This extra expense must be met by new taxes. For myself, I personally mourn the passing of

the pungent odor of burning leaves. To me, it was one of the pleasant experiences of our crisp fall season. It has been replaced by the soggy leaf problem. Many citizens who cannot or will not bear the expense of removal let them accumulate in gutters or in unsightly piles.

State highway jobs which are let for bid, now have an added cost factor. Rather than burning brush on cleared land, it is now necessary to load such material onto trucks for removal. Brush refuse has to be trucked to some dumping area or ravine and covered. Result is higher costs of highway construction which are passed on to the taxpayer.

At the same time that such added costs are being passed on to the taxpayer, legislators who passed the Anti Air Pollution ordinance are telling constituents back home that they are taking "a long, hard look" at the problem of rising costs. In my opinion, unless we graduate from the "long, hard look" to the "short, sensible action" we will have further increased costs.

In summary, I believe that the idea behind the anti pollution program is commendable, both in New York State and across the nation. If we don't take steps to purify the air we breathe, we may suffer lung ailments and other types of associated illnesses. But since motor vehicles and industrial stack wastes contribute many of the known pollutants, and certainly the most toxic materials, I feel that there is much to be done before we worry about wood, brush, and leaf burning.

My opinion is that burning of wood, brush, and leaves in a sensible manner should be permitted. By the time wood smoke is dissipated into the air, its pollutant effect is only a tiny fraction of the total air pollution problem. Its toxic effect on the lungs of the citizenry is infinitesimal when compared to the smoke inhaled into the lungs by cigarette smoking.

*(Editors note: Mr. Bartles formerly served as Supervisor of the Town of Hyde Park, N. Y., and is presently serving as Majority Leader of the Dutchess County Board of Representatives. This board has recently passed a resolution asking the state to rescind that section of the ordinance which prohibits burning of leaves, wood, and brush. WEEDS TREES AND TURF carries this editorial because of the industry's need to remain alert to this type of restrictive legislation.)*



Laying 1½ inch pipe during installation of Calabasas Golf Course. Contract for entire course design, construction, and irrigation totaled more than \$350,000.

# Calabasas Course

## Exemplifies Design and Installation Technology

**G**OLFERS hitting into the rough at Calabasas Golf Course in Southern California should keep a look-out for Cowboys, Indians or possibly even Robin Hood and his Merry Men.

The Calabasas Golf Course, scheduled to open in early summer this year, is located on the scenic, 3000-acre Warner Brothers Studio Ranch. The former filming locale of many westerns and swashbuckling Robin Hood adventures, now called Calaba-

sas Park, is nestled in the Santa Monica Mountains north of Los Angeles.

Today's Men of the West, designers, contractors and irrigation experts have transformed 150 acres of native Calabasas Park scenery into a gourd-green championship golf course.

The course, part of a large development of fine homes and recreational facilities is a project of Calabasas Park Company, a partnership of Associated South-

ern Investments and Bechtel International.

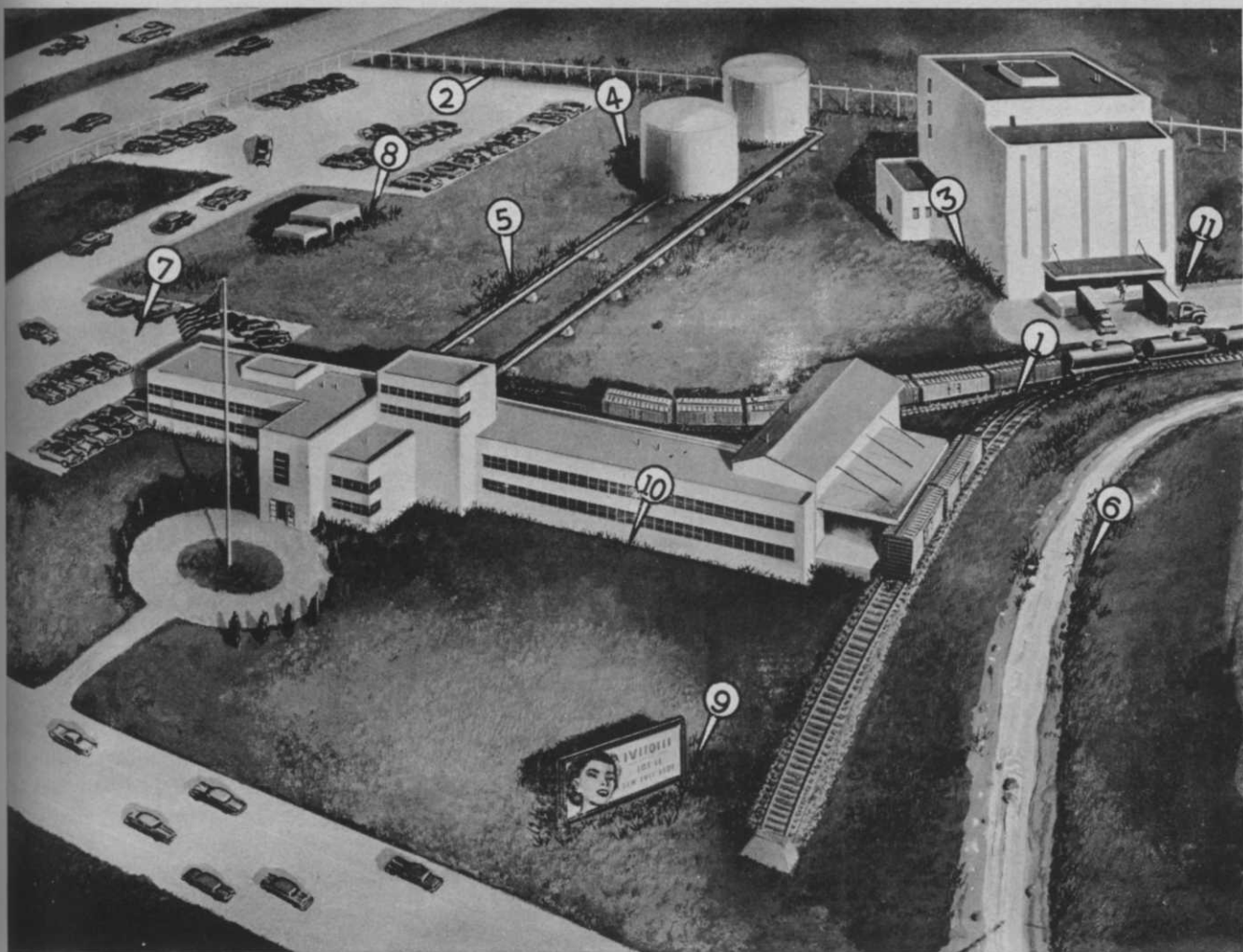
It was constructed on rolling hills covered with virgin vegetation that included holly oak, white oak, mesquite, thistle, poison oak and a great deal of rock.

The native ground cover is picturesque from a distance, but comes-up lacking as a championship golf course fairway. A major objective of the course designer Robert Trent Jones, Inc. Palo Alto, Calif., was to retain

Automatic irrigation system is set to operate during all summer daylight hours. Superintendent John Little irrigated 2 minutes per hour with misting throughout the germination period.







Railroad sidings (1) and security fences (2) are among the many locations where you can control unsightly vegetation with Du Pont "Hyvar" X and "Hyvar" X-WS. Take advantage of this great profit opportunity by basing your weed control service on these Du Pont herbicides. Other locations in and around a typical plant where they can stop potential trouble are warehouses (3) tank areas (4) pipelines (5) ditches and roadsides (6) parking lots (7) storage areas (8) signs (9) around buildings (10) loading docks (11).

## These 11 spots are potential trouble... they can mean more profit for you with **Hyvar® X bromacil weed killers** (or products containing bromacil)

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More than 100 miles of control wire was laid to provide the automatic control between pressure regulator control valves and controllers.

the wild-west flavor and beauty of the surroundings, while creating a controlled beauty of fairways, greens, tees and roughs.

Irrigation technology played a highly important part in the development of the construction plan and the ultimate maintenance plan for the course.

#### Course Can Be Irrigated In 10-Hour Period

The irrigation system for the 6,600 yard par 72 course was designed by Robert Trent Jones Irrigation Consultant John A. McPherson. His ultimate irrigation objective was to have a system capable of automatically irrigating the complete 150-acre course

Typical end of line is this 3-inch main line and valve. From the main lines, 15 miles of lateral line pvc pipe was pulled into place by Lowe Hydro crews using a vibratory plow.



within a single 10-hour period.

Intermediate steps along the way called for planned stages of installation of the irrigation system so that germination of the turf could be handled by quarters of the course at a time.

The complex contract, which totaled more than \$350,000 was concluded successfully through careful advance planning and continual communication between McPherson, Lowe Hydro of La Habra, Calif., the irrigation contractor-installer, and the major equipment supplier Buckner Sprinkler Company of Fresno, California.

Following rough and final grading, a total of five miles of transite main line 6 inches in diameter was trenched in. These traverse the course and run to the pumping station. The station is capable of supplying 1800 cpm from three 550 gpm pumps and one 150 gpm pump. The pumping units operate on a pressure call or demand system, and are fed from two lakes constructed on the golf course. The system operates at 150 psi.

Water is supplied by a 16-inch main from the Los Virgines water district to the two lakes. The water supply is automatically controlled to keep a constant lake elevation, an approximate 3 million gallon reservoir.

From the main lines, 15 miles of lateral line pvc pipe were

pulled into place by Lowe Hydro crews using a vibratory plow. These service a total of 800 large area pop-up sprinklers and 400 bank erosion control or landscape bank heads. All area pop-up heads on the course were Buckner #1371 sprinklers with 13/32 x 7/32 nozzles.

The carefully planned erosion bank heads were Buckner #860 G full circle and Buckner #560 G part circle heads. The banks were programmed so that adjacent laterals operate alternately to prevent erosion.

More than 100 miles of control wire was also laid and pulled into place to provide the automatic control between 300 Buckner #152 GER pressure regulator control valves and 66 Buckner #611 E controllers.

The basic layout placed the fairway sprinklers in a triangulated pattern 90 feet on center. One canyon at a higher elevation was spaced 80 feet on center. There is an average of 5 heads on each green and an average 4 to 5 heads irrigate each tee. A single controller operates the sprinklers at each green and adjacent tee, and 2 automatic controllers operate each typical fairway system. A Buckner pressure regulator control valve under each head provides uniform coverage and flow regardless of position on the line. All the sprinklers operate at 75 psi at the nozzle.

The controllers and the entire system are very adaptable to changing irrigation needs, according to John Little, superintendent of Calabasas Golf Course. "With the controllers placed as they are, we can vary our area control precisely and easily," Little said.

#### Greens Built Up With Sand Base

After sectional installation of the irrigation system, the greens were built up using 12 inches of sand on a graded base. Three inches of loamite (lignified wood shavings) were rototilled into

## 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.

Could be the area is large. Or small. It may be easily accessible. Or it might be difficult to reach, either with sprays or big equipment.

These, as well as moisture availability and soil type, are just some of the conditions you have to consider before selecting a herbicide.

But whatever the weed problem, you'll find the right answer in one of the five Geigy industrial herbicides. Why? With them, you can solve just about any weed problem you might encounter.

What's more, each Geigy industrial herbicide delivers long-lasting residual control with once-a-year application. So they're most economical, too.

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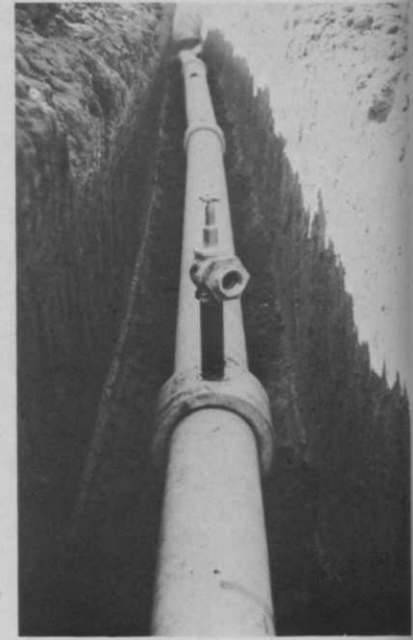
Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation, Saw Mill River Road, Ardsley, New York 10502.

# Geigy

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Pumping station on Calabasas Course is capable of supplying 1800 cpm from three 550 gpm pumps and one 150 gpm pump. Pumping units operate on a pressure call or demand system and are lake fed.



After final grading, 5 miles of transit main line 6-inch pipe such as this was trenched in.

the sand. The greens were planted with Penncross bent grass.

On the fairways the turf was stolonized with Tifway #419 hybrid bermuda and the roughs were seeded with Kentucky blue grass applied in a slurry mixture. The erosion banks were also seeded with the slurry technique.

Germination of the planted turf was an early test of the irrigation system and started June 4, 1967. This crucial period extended through late August. The stolonized turf required roughly 4 times the normal amount of water to maintain an existing turf, and the dependability of the Buckner system proved itself in the resulting turf.

On greens and tees, periodic misting of the areas proved most successful according to Superintendent Little. The system was set to operate during all the summer daylight hours. Little chose to irrigate 2 minutes per hour each day through the germination time, and has reaped a gourd-green, healthy turf from his precisely controlled irrigation.

After the course is open for play, the adaptability of the Buckner Irrigation System will be extremely valuable again, ac-

ording to Little. Quick economical adjustment of irrigation control can be made easily to meet watering requirements of the course according to the amount of play it receives, mowing schedules and the quality of play. Initial plans call for watering greens every night and fairways every other night.

Trees were planted throughout the course from existing trees on the property. There were many conifers — some 25 feet high—and some were a back-

drop for Robin Hood in the films of yesterday.

Nursery trees, eucalyptus, flowering plum, liquid amber, and varieties of oak were also planted as part of the overall landscape design. Along with the lush fairways, greens, tees and roughs they create a green carpet that reaches to rugged background hills. Calabasas Golf Course is truly a magnificent example of the results of combined expert design, irrigation and installation technology in the west.

Once established, lush carpet of fairways, greens, and tees reach to rugged background hills. Course is example of how 150-acre area can be transformed into a championship type golf course.





# Irrigation Roundup

**tips from specialists in the field  
to 3000 golf course superintendents  
at the GCSAA 39th International  
Turfgrass Conference and Show**

## Cost Analysis:

Garold M. (Jerry) Murphy, superintendent, Somerset Country Club, St. Paul, Minn., reported on the 1967 conversion of a quick coupling system at his club to an automatic Toro Vari-time satellite system.

For GCSAA members, he presented an analysis of the costs and general operating experiences with the new system. His own time in operating the new system requires 5 to 10 minutes once or twice weekly. This is spent adjusting the master controller to adapt to changes in weather and spot checking of satellite control dials.

Sprinklers for the system are gear driven and make the complete revolution in 3 minutes. This, Murphy pointed out, is adequate for relief of stress under the Somerset course conditions. This also permits timing syringing to suit play and results in minimum interference with golfers.

Operating costs presented in the table include electricity and lubricant for the pump and gas and lubricant for the patrol ve-

**Table 1. Cost of Operation—Quick Coupling Vs. Automatic.**

Hours	Quick Coupling			Automatic		
	July	Aug.	Sept.	July	Aug.	Sept.
Operation—System	300	250	140	300	260	140
Labor—Night watering	200	180	140	0	0	0
Syringing	100	70	0	35	20	0
<b>Cost</b>						
Operation—equipment	\$ 720	\$ 570	\$ 220	\$ 600	\$ 540	\$ 180
Labor at \$2.00/hour	600	500	280	70	40	0
<b>Total</b>	<b>\$1,320</b>	<b>\$1,070</b>	<b>\$ 500</b>	<b>\$ 670</b>	<b>\$ 580</b>	<b>\$ 180</b>

### Three Months' Totals

Quick Coupling	\$2,890.00
Automatic	1,430.00
<b>Savings</b>	<b>\$1,460.00</b>

hicle. It does not include repair or depreciation. Cost for the 2 systems is comparable. The slight difference in favor of the automatic system probably is valid, since night watering can be completed in 12 hours as compared to the 14 hours formerly needed with the quick coupling system. Major operating cost, Murphy said, is for electricity.

Some cost benefits of the automatic system are difficult to assign a monetary value, Murphy reported, but they do exist. He enumerates them as turf benefits and as people benefits. He

suggested that superintendents might assign their own dollar value to these (Tables II and III).

In general, Murphy said, the savings in labor and operating costs are significant and impres-

**Table 2. Turfgrass Management Benefits—Favoring Automatic.**

1. More efficient use of water.
2. Precise control of water.
3. Water conservation.
4. Minimum loss of turfgrass.
5. Less wear and tear on turfgrass.
6. Easy to remove dew and frost.
7. Easy to water in fertilizer.
8. Less down time associated with sprinkler repair.

**Table 3. People Benefits—Favoring Automatic.**

1. Golfer satisfaction.
2. Happier crew—no one assigned night duty.
3. Smaller more efficient crew.
4. Less vandalism.
5. Shop is locked at night.
6. More favorable comments on condition of golf course.
7. Peace of mind—Superintendent.

sive. Of even greater importance, he believes, especially to himself and the Club, are the benefits related to golfer satisfaction.

### Irrigation System Design:

Chances are, when you invest in an automatic irrigation system you are going to pay the same price as a good, well planned system would cost. Why not insure that you will get what you pay for? This is the opinion of Richard R. Abernethy, Telsco Industries, Dallas, Tex.

Abernethy, in presenting the official GCSAA Golf Course Irrigation questionnaire to GCSAA members for help in planning and designing custom irrigation systems said that the trend today

is toward "turnkey" design and installation. This type system, he said, is done by competent, specialized golf course contractors. Such firms today are well capitalized, employ engineering personnel for both design and construction supervision, and have the specialized equipment to do the job right.

Tremendous responsibilities are placed on the superintendent by members and directors for the success of a system which is a major investment. Abernethy points to the questionnaire as a means of covering, in practical language, all the major areas necessary for the irrigation designer to prepare an authentic, accurate and practical estimate of individual irrigation needs.

No one knows the course better than the superintendent, Abernethy implied. He pointed out that water requirements vary from one geographical area to another. Fairways, greens and tees require special consideration, especially for drainage and wind problems. Only the superintendent knows how often the

course requires hand or supplementary manual watering. Thus, he believes that the questionnaire provides the "common denominator" which will enable the superintendent to (1) better evaluate the job, (2) communicate the facts to the decision making administration, and (3) better understand the finished product or design when the final plans are presented for approval.

This approach, Abernethy said, can save money.

### Primary Decision Making:

Engineer Don A. Hogan, D. A. Hogan & Associates, Seattle, Wash., presented the 3 common approaches to the problem of golf course irrigation design and installation and the problems associated with each. First, Hogan said, is the "package deal" or the "turnkey job." This is attractive, but Hogan pointed out, leaves the club somewhat vulnerable because the seller determines amount and quality of work and material, while the owner does

#### GOLF COURSE IRRIGATION SYSTEM CHECK LIST AND PLANNING GUIDE

Name of Course _____	13. Contemplated water supply _____	22. Desired completion _____ (Date)
Address _____	14. Lagoon or reservoir data _____	
Phone _____		23. Type of pipe desired:
Superintendent _____		(a) Main lines: A.C. _____ C.I. _____
Club Official _____	15. Prevailing wind direction _____	Other _____
Architect or Engineer _____	@ _____ mph _____	(b) Laterals: PVC _____ Copper _____
Address _____	16. Type of system desired:	Galvanized _____
Phone _____	Quick coupling valves _____	24. Location of pumps and pump house _____
	Rotary Pop-up _____	
1. Plot Plan available? _____	Automatic _____ Manual _____	
2. Topographic Map available? _____	25. Location and availability of electrical power supply _____	
3. Number of holes—9 _____ 18 _____	17. Special instruction greens:	
4. Type of system desired—Fairway _____	Pop-up _____ Manual _____ Automatic _____	
Tee & Green _____	(a) Pop-up with quick coupler for supplemental hand water _____	
Fairway, Tee & Green _____	(b) Valve leeward and windward heads separately _____	
5. Total yardage of course _____	18. Total time desired for weekly watering program _____	
6. Fairway width _____	19. Desired inches precipitation per week:	
7. Fairway turf _____	(a) Fairway & Tees _____	
8. Greens turf _____	(b) Greens _____	
9. Type of soil—Sandy _____ Loam _____	20. Any special operational desires _____	
Clay _____ Rocks _____		
10. Sod removal—All _____ None _____	21. Desired time to start installation _____ (Date)	
Club handles _____		
Contractor handles _____		
11. Ground water table _____		27. Design Check List:
12. Available water supply _____		1. Aerial photo required—Yes _____ No _____
		2. Field check to confirm measurements—Yes _____ No _____
		3. Preliminary plan approval—Yes _____ No _____
		4. Final presentation complete plans & specs—Yes _____ No _____

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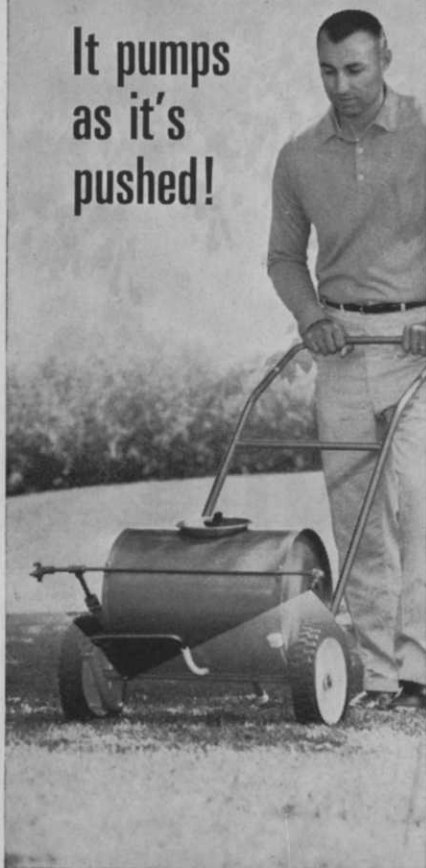
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not have an experienced person protecting his interests. Normally, design and materials are limited to a single representation. And, Hogan said, it is not probable that architectural professional ethics can be completely divorced from the influence or effect of the contract profit aspects.

The second approach is the combination of design and materials supplied by one firm and a separate contract for installation, or where the owner installs the system. This method, according to Hogan is normally less costly. Here, again, he said, lack of construction coordination may result unless the owner has an unbiased, experienced representative to supervise and coordinate the project. The term "design" as applied usually covers only a simple drawing or layout. Other engineering requirements must be performed in conjunction with the basic layout.

The 3rd approach by Hogan was the professionally designed system by a qualified engineering firm, combined with the installation being performed by the successful bidding contractor. In this case, the contractor's work is supervised and inspected by the engineering firm who represents and protects the interests of the owner. Hogan, an experienced engineer in the business, believes a private engineering firm paid directly by the owner is the best arrangement.

The team approach, in the belief of Hogan, can result in the most satisfactory system. He lists team members as follows: (1) club committee, (2) golf course superintendent, (3) professional designer, (4) installation contractor, and (5) material suppliers.

Each member group on the team needs specific qualifications and has definite responsibilities, Hogan said. The club committee is first. This group needs to be dedicated and will-

ing to devote time and effort. They must work directly with the golf course superintendent and engineer.

The golf course superintendent is a vital team member. His knowledge of the course and turf management will influence the type of system to be approved. He must present operating costs in conjunction with the engineer, work out completion schedules, and see that future plans of the course are in line with the new system, plus a myriad of other details which must be coordinated with the entire team.

The 3rd member of the team, the professional designer, must work closely with the club committee and superintendent in a detailed design. This will include all construction details and specifications, prepared for bidding and construction control purposes. He must screen bids, approve materials, monitor construction work, and perform necessary tests, in detail, of the installed system. Finally, upon completion, he must certify the installation and furnish operating instructions and "as-built" drawings.

Job of the contractor as a team member is to install the system in a workmanship manner in complete accordance with the specifications. He must use quality materials and equipment, and supervise the project, at the same time working closely with the superintendent to familiarize him with operation and maintenance.

Material suppliers must provide data on materials and equipment, assist the contractors in bidding, coordinate delivery of materials, instruct the construction crew, assist in final adjustment and testing, and generally service their products.

Because of the magnitude of the modern irrigation system, Hogan pointed out that it warrants the best possible development. It is a serious mistake, he said, to settle for less.



# Tree Planting Review

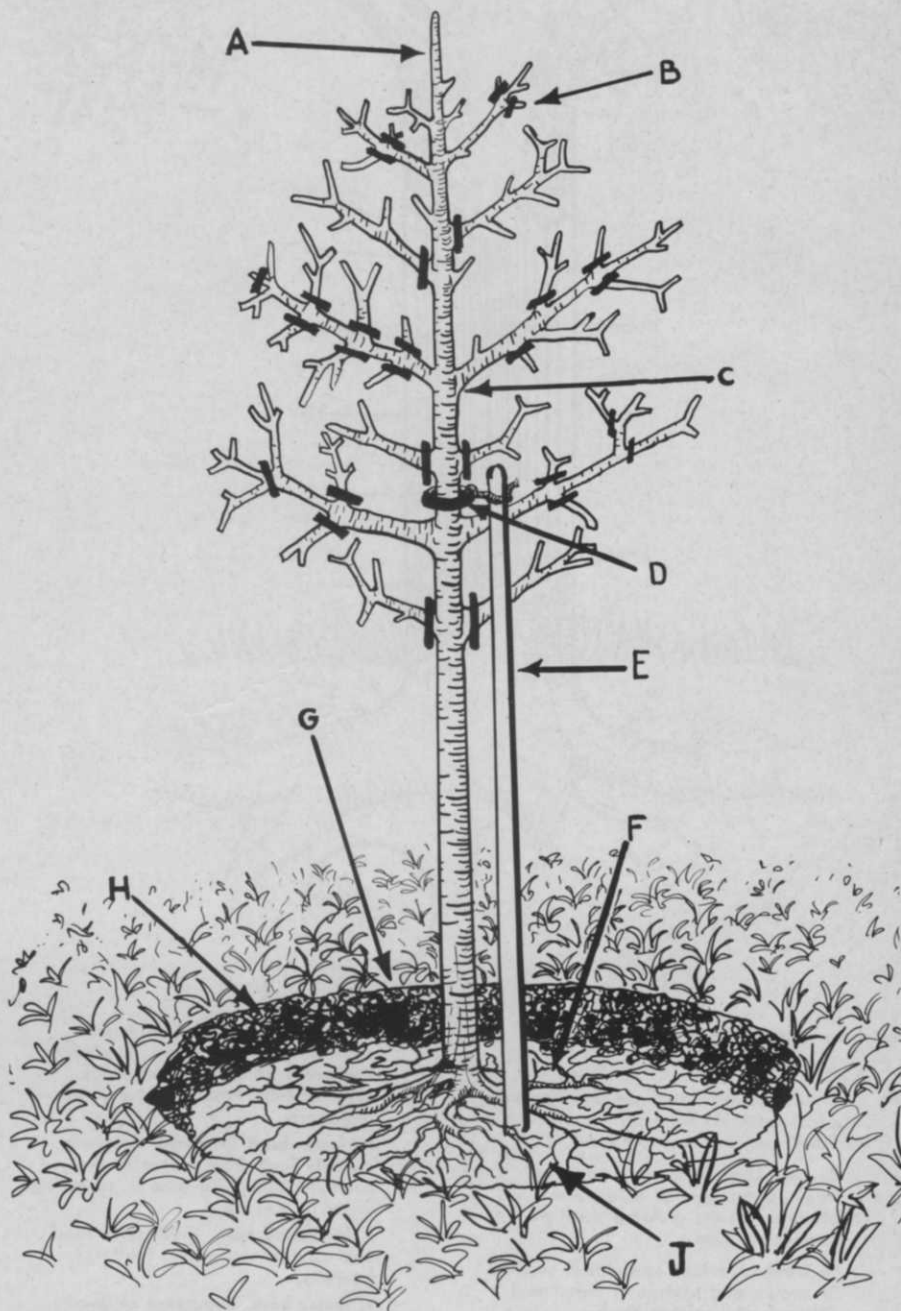
## *check list for new employees*

**T**REE CARE MEN have to answer lots of questions. During tree planting operations, passersby and buyers become literal sidewalk superintendents. Questions as to why medium-sized and dwarf species are best for streets and ranch-type homes need answers. This is good for the industry.

At the same time, the tree man must be prepared to astutely discount the value of old, favored, but less desirable trees. For example, he must explain why Chinese and Siberian elms, poplars, willows, silver maple, boxelder, and others are not suitable. Though fast growing, they are relatively short-lived. Also, their brittle wood is susceptible to storm damage, roots invade underground pipes, and they are subject to pest and disease attack. A learned explanation assures the onlooker and promotes the professional care business.

Further, careful planting can build business. It does much to increase the percentage of trees which survive a move. This is especially true of wilding trees. Nursery stock is usually much easier to handle.

Most tree men prefer nursery stock, either that grown by themselves or purchased from a reputable operator. Nurseries generally offer a large selection of sizes and species. When compared to wilding trees, the nursery trees will have better root and crown systems, will become



**A.** Well developed head with strong leader, branches set at wide rather than close angles.

**B.** Before setting, tree should be pruned at points indicated by black lines rather than clipping the ends of branches.

**C.** Base of permanent crown should not obstruct walks or roadway.

**D.** Loop brace needs to be loose, pliable. Remove after the tree becomes firmly established.

**E.** Stake, 2½ inches by 10 feet in height,

needs to be driven into ground and secured with rubber covered wire or canvas.

**F.** Preserve all fibrous roots possible. Remove broken roots with a clean cut.

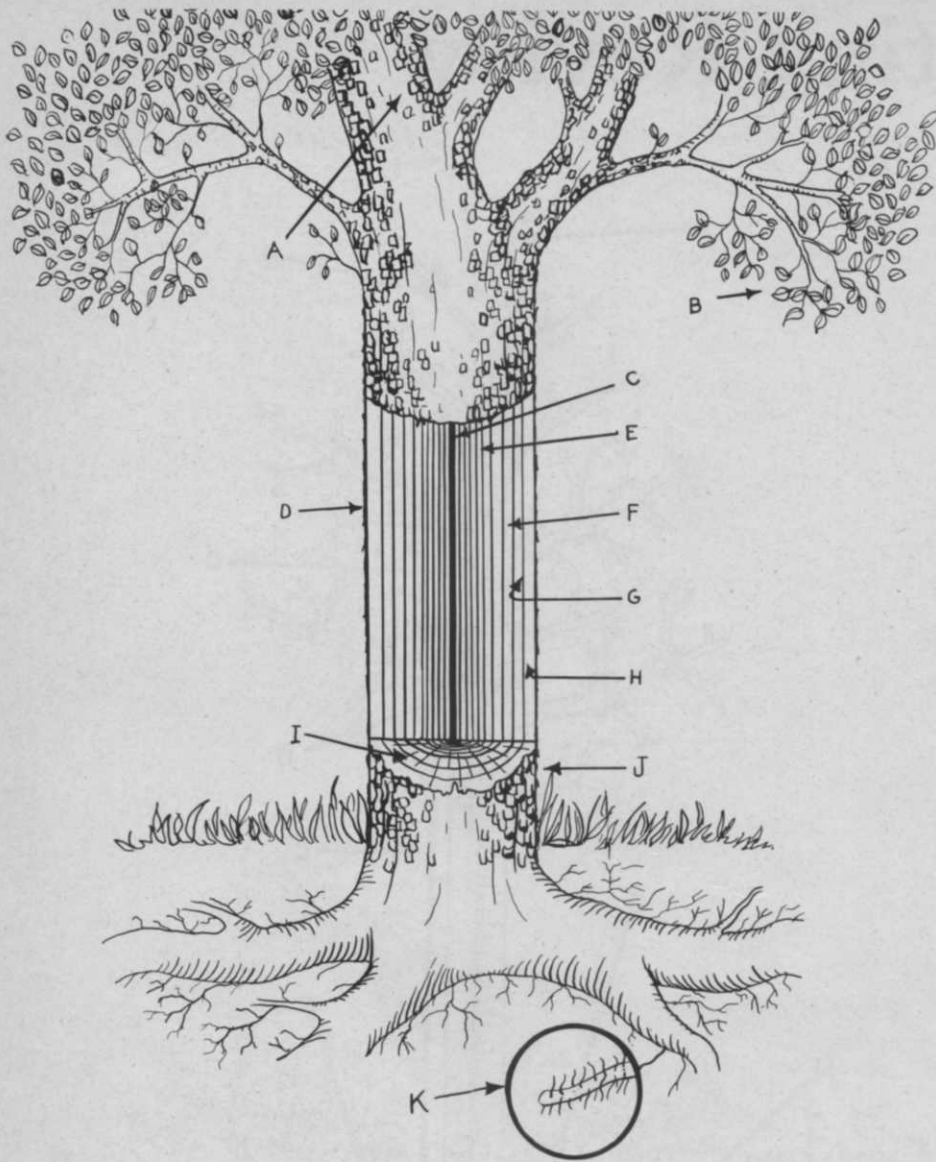
**G.** Dig hole at least 2 feet in diameter and 18 inches or more in depth.

**H.** Fertile soil needs to be packed firmly about roots and the hole filled to original soil level on trunk. Keep the soil surface pulverized.

**J.** Set tree 2 inches deeper than it was originally in the nursery. Fill hole to the lower root level with a 3:1 mixture of good soil and peat moss.

established more quickly, and are more likely to live.

When wilding trees are used, they need to be dug in open rath-



#### Functional Tree Parts

##### A. Crown.

B. Leaves. With sunlight these convert carbon dioxide from the air plus "raw" sap into useable food.

C. Pith. Located at very center of trunk. Composed of tissue which is produced at the growing point of the elongating stem.

D. Trunk. Provides mechanical support for crown and transports water and nutrients plus storing food manufactured in leaves.

E. Heartwood. Composed of dead cells and main function is support.

F. Sapwood (xylem). Conducts "raw" sap from the roots to leaves. Consists of both living and dead cells.

G. Cambium. Located between sapwood and inner bark or phloem. Composed of a thin, continuous layer of cells. Produces new wood and bark.

H. Inner bark (phloem). Conducts useable food from leaves to the cambium to nourish tree or to storage areas in the wood.

I. Medullary rays. These store food and conduct water and food laterally.

J. Outer bark. Composed of dead cells. Insulates and protects inner tissues from disease, infections, and drying.

K. Roots and hair roots. Hair roots absorb water and mineral salts from soil. Larger roots anchor tree and store nitrogen and carbohydrates.

er than wooded areas. When possible, pick trees from areas where soil is rich and deep. Trees growing from sprouts or in clumps should not be used. Also, with wilding trees, save as much

of the fibrous root system as possible. A tree not more than 10-12 feet in height is a good size to plant.

Trees larger than 12 feet can be successfully transplanted. But

such trees require the extra care gained by experience. Special methods and heavy equipment are also needed. Small trees, those 6-8 feet in height and about 1½ inches in basal diameter, can be dug and moved immediately. Larger trees, 10-12 feet in height and more than 2 inches in basal diameter, respond best when root-pruned a year before moving. Make the root-pruning cut about 6 inches away from the tree for every inch in diameter of the trunk. Remaining roots then form a compact fibrous root system ahead of moving the following spring.

#### Large Trees Can Be Successfully Transplanted

For even larger trees, those with basal trunks of more than 3 inches, root-prune for 2 years and move the 3rd year. In the first year, root-prune only part of the way around the trunk. Do the final root-pruning the 2nd year and then move the tree the next season. Though this is seldom practical, it is safest and will pay dividends in livability.

Evergreens are dug the same as hardwoods, making full use of the soil ball. However, evergreens need not necessarily be root-pruned prior to digging. When moving trees with a soil ball, work burlap well up and around the ball. Tie the burlap at the top of the ball so that it holds the soil securely in place.

Hardwoods may also be dug with roots bare. When this is to be done, dig around the tree carefully and cut the roots. Use a spading fork to loosen soil. Do this by gradually working the soil away from the roots. Start at the outer edge where the cut has been made and work toward the tree. In moving trees with bare roots, place peat moss and burlap around the root system. In all cases, keep roots moist until planted.

Best tree planting time is spring, during the dormant stage



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before the buds break. Trees are also easily moved during fall months, from leaf-coloring until freezing weather.

Once dug, trees need to be planted as soon as possible. When stock cannot be planted immediately, it needs to be heeled in by setting roots or soil ball in a hole, covered firmly with soil and kept moist.

Planting sites are important. Street trees do best when planted inside the sidewalk, rather than between walk and curb. The exception to this, of course, is when there is a wide area available between walk and curb.

Before planting, carefully consider the size of the fully matured tree. Trees need to be set 30 feet from structures and 50 feet apart. Make the hole deep enough and with sufficient width to receive the root ball without crowding roots. It is wise to dig a larger hole than needed and to refill excess space with a mixture of well-rotted manure, compost or peat moss, and rich loam. Trees need to be set about 2 inches deeper than they were in their original site.

When planting, remove burlap from ball or lay it flat in the hole. Spread all roots in a natural position. When this is not done, girdling roots may result and kill the tree. Jagged, broken, or badly injured roots need to be cleanly cut above the injury. Save as many small, fibrous roots as possible. Fill the hole in steps with a mixture of soil, rotted manure or peat moss. Tamp slightly and water as more fill is added. This forces soil around the roots and prevents air pockets. Leave a small depression around the tree to catch as much water as possible.

Stake the tree with loops which are attached loosely. Canvas or other pliable material such as a section of rubber hose works well. Do not use anything which will injure the bark. Com-

mercial loops can be purchased. Also, a recheck to see that stakes are holding the tree in a rigid position is worthwhile. Water as conditions warrant.

In the case of hot or particularly drying weather, the prepared anti-drying mixtures or waxes may prove profitable. These permit the tree to become established without too much drying out.

### Hardwoods Need To Be Pruned Before Planting

Top-pruning is a must for hardwood (deciduous) trees. This offsets root loss which results from digging and moving. Nursery trees, because they have been root-pruned prior to digging, need less pruning than wilding trees which are dug and immediately planted.

Pruning needs to be distributed over the tree rather than just removing the ends of all limbs or removing all the branches on the lower half or third of the tree. Remove interfering limbs. Space limb crotches so that plenty of space is left for each remaining limb. Cuts should be flush for rapid healing of pruning wounds. Never cut back the leader unless one of the laterals in the top whorl is also removed. Otherwise, an undesirable forked tree will result.

Evergreens are seldom pruned except when root loss is severe. In such cases, remove some of the past year's lateral growth. Do not prune off entire limbs on evergreens or the natural form of the tree will be destroyed.

*Recommendations for this WTT Tree Care Report are based on technical material of the Maine Forest Service. Illustrations likewise are based on Maine recommendations for planting and care of shade trees and supplied by Maine State Entomologist Robley W. Nash, Augusta.*

# One Method For Upgrading Turf

By Robert W. Schery

Director, The Lawn Institute, Marysville, Ohio

**E**ARLY spring and autumn are two times of the year when something can be done about upgrading the lawn through introduction of choice varieties. Since a cultivated seedbed gives a new seeding its best chance, results are surest if the old lawn is plowed up, with unwanted vegetation perhaps first knocked out by arsonate or paraquat. Especially prized turfs, such as a golf green, may merit the expense of soil sterilization, as with methyl bromide.

But not everyone cares to invest in so complete a renovation, especially in spring when a badly disturbed lawn would hardly complement freshly budded ornamentals. Instead mechanical treatment of the old turf might offer a less drastic, inexpensive approach. It provides something of a seedbed for new seed at the same time that it sets back weedy growth in the old sod.

Some reports suggest that coarse bunchgrasses such as tall fescue may be repressed while rhizoming grasses such as Kentucky bluegrass and the fine-leaved fescues gain ground, following severe mechanical attrition of a mixed sod. Fresh sprouts from rhizomes are only a few days in appearing, and if adequate moisture prevails bolster seeding is not much longer in getting started. Maceration of the bunchgrass yields space to competing species, and should reduce stooling of the clumps. It is well to have completed mechanical renovation before the soil warms enough for crabgrass to germinate, or else a suitable crabgrass preventer should be used, (products containing siduron can be used at the same time Kentucky bluegrass, fine fescue

and Highland bentgrass are seeded, but not with bermudagrass).

### Variety In Equipment

A number of machines useful in mechanical renovation are on the market. Aerifiers designed to loosen soil by punching holes have only limited usefulness, but the so-called vertical mowers for thinning, set deep enough to reach the soil, really stir things up. The intensity of treatment can be varied with the weediness of the turf. Most machines have the vertical slicing discs spaced about an inch, and thus make striations this distance apart when used one time over. If you want to really chew up the surface of the old lawn, mow vertically several times in various directions.

At least one machine on the market has three interchangeable reels for differing objectives. Besides the typical vertical slicing blades, there are flexible tines to comb thatch gently out of erect grasses such as Kentucky bluegrass and fine fescue with a minimum of bruising. And for a severe bludgeoning of the old sod, flails much like a hammermill literally beat the vegetation to pieces. Where the lawn is little else than coarse grass clumps the flail might be used first, possibly followed by soil slicing to provide lodging sites for new seed.

Of course there is no guarantee that the varieties newly provided by overseeding will gain the upper hand or even prosper. But at least you will have introduced select grass with the possibility of upgrading the lawn. Mechanical renovation certainly affords seed a better chance for gaining a toehold than if simply

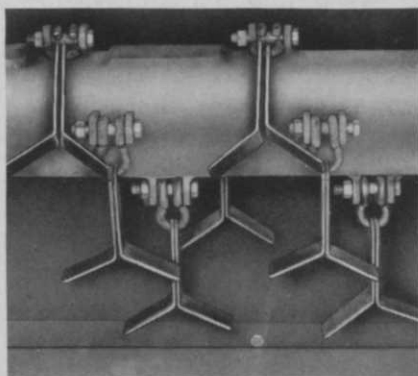
cast upon untreated turf. And in breaking up whatever thatch there may have been, fertilization is made more efficient. The granules are thus more easily accessible to soil and rootzone.

### Tailored Grasses

Incidentally, there are many new varieties of fine turfgrass, often tailored for a particular kind of performance. Fylking 0217 brand, low-growing bluegrass out of Scandinavia, is first becoming available in quantity this year; it may prove useful as a companion for Colonial bentgrass in closely mowed fairways and for disease-resistant sod. Where well adapted, Merion still reigns as queen of bluegrass varieties, although, like Windsor, it suffers stripe smut in certain regions. Old-line natural bluegrass from Kentucky is now certified as Kenblue, while Arboretum is a similar mixed population out of Missouri. Park, famed for fast-sprouting is a composite from Minnesota. Prato is another attractive European selection while Newport and Cougar are workhorse varieties originated in our own Northwest.

There are new lawn fescues, too, Chewings, Illahee, Pennlawn and Rainier being joined by Highlight, Oasis, and others. Seeded bentgrasses are rather few, with Penncross the favorite creeping type, and Highland the most used of the Colonials (Astoria and Exeter are other recognized names). Kingstown is a velvet bent for meticulously kept speciality turf. These are but a few of the specially bred fine turf possibilities your seedsman might recommend for introducing new blood into the lawn during its mechanical renovation.

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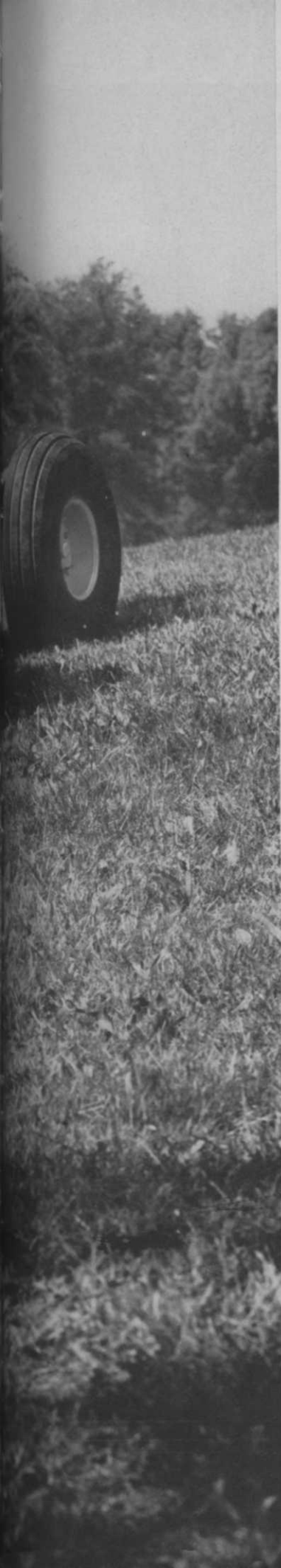
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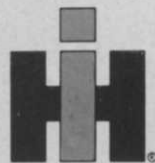
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Col. Harry C. Eckhoff



New GCSAA officers, left to right, are: John J. Spodnik, vice-president; Walter R. Boysen, president-emeritus; and James W. Brandt, president.

## 39th Annual International Turfgrass Conference and Show Report

# Golf Courses Become Integral Part of Plans For New U.S. Communities

Few conventions match the spectacular staged by golf superintendents at the San Francisco Hilton, Feb. 18-23. Even fewer give their members as complete exposure to new methods and equipment at these annual

**Program Moderator Dr. Marvin H. Ferguson, Mid-Continent Director, USGA Green Section, opens afternoon session.**



events as does the Golf Course Superintendents Association of America.

Meeting for their 39th International Turfgrass Conference and Show, members needed to cover some 42,000 square feet of floor space in order to visit the 258 exhibit booths plus the meeting sessions. Practically every type of equipment available for turf care and golf course maintenance was on display. Conference sessions featured leaders in the field and offered the equal of a comprehensive course in course management for benefit of the delegation of almost 3000

### 9 Million Golfers In '67

Trends in the business proved a highlight of both formal and hallway sessions. Colonel Harry C. Eckhoff, facility development consultant, National Golf Foundation, in discussing these trends

said that an interesting golf course is now considered an integral part of newly planned communities.

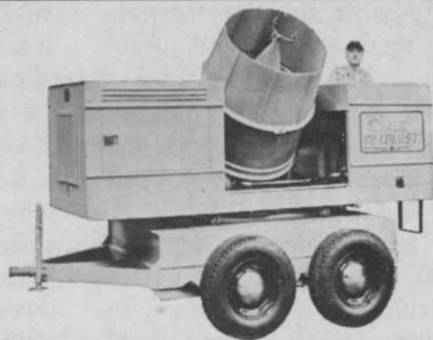
Eckhoff reported that 9 million persons in the nation now play the 9000 existing courses. Further, golfers are increasing at a rate of 10% yearly. Estimated cost to maintain the nation's golf courses last year amounted to \$245 million. But golf related expenditures of such items as equipment, apparel, refreshments, and other items of cost makes golf spending a billion dollar business.

Public courses comprise only 14% of the total courses in the country. But these public courses receive about 40% of the total golf play. Semi-private courses account of 35% of the play and the remaining 25% play is on private country club courses. Eckhoff reported that play on many 18-hole public courses averages 250 to 300 rounds every



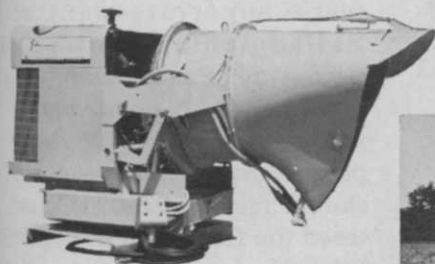


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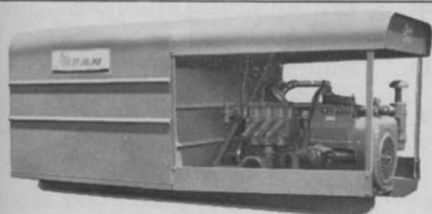
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day during the season. Play is booming with the big increase coming from women and junior golfers.

Despite a growth in facilities, Eckhoff said that courses are becoming more crowded each year. A total of 437 golf facilities were opened for play in 1967. These included 278 new regulation length courses, 114 additions to regulation length courses, 40 new par-3 layouts, and 5 additions to par-3's. Leading states in new facility development were: California, 39; Pennsylvania, 27; Ohio, 26; New York, 25; Michigan, 24; Florida, 22; and Texas, 17.

#### **New Junior Courses**

Of interest was the opening of 2 junior courses. The Lincoln Junior Golf Course, a 9-hole par-3 municipal operation was opened at Lincoln, Neb., by the city's Park and Recreation Department at a cost of \$58,000. A 4-hole, 335 yard layout for children only was also opened at Bangor, Me. Three other known junior courses, at Minneapolis, Minn., Syracuse, N. Y., and Hershey, Pa., are in operation.

Both new course openings and facility starts were down in 1967, Eckhoff said, largely because of a shortage of available mortgage money at reasonable rates. With an easing of the money market, Eckhoff indicated that this downward trend will shortly reverse itself. Golf, he said, continues to attract players from every economic level. It is a sport played by persons of all ages throughout their lifetimes. Further, he said, golf facilities benefit a community in many ways. Civic pride is stimulated, new business created, open space increases property values, new industry is attracted, and healthful recreation is provided.

Trees require the same good management for growth which is needed for turf. Carl F. Whitcomb, horticulturist at the Uni-

versity of Florida, Gainesville, told superintendents that experiments at the Florida Station showed that trees and turf can be grown together successfully if managed properly.

Turfgrass, Whitcomb said, when maintained in a healthy state is a vigorous competitor. It can successfully compete with weeds, and can compete as well with trees, to the detriment of the trees, unless steps are taken to select the right type trees and then protect them.

Whitcomb reported that Florida tests showed that established bluegrass was not hurt by tree competition when light, water, and nutrients were adequate. Foliar growth, stand density, and root development proved normal.

However, the bluegrass did influence tree root development. Shallow rooted trees such as silver maple suffered from grass competition. Honey-locust, a deep rooted tree did not. Whitcomb listed other shallow rooted trees such as sweet gum, cottonwood, willow, and Australian-pine which should not be planted near greens or tees. If they survive, they will eventually create severe root problems. Deep rooted trees such as the honey-locust and Kentucky coffee tree are less likely to cause a maintenance problem.

#### **Customer Service Important**

Manufacturers today expect and encourage customers to use warranty services. So, Thomas E. Ames, manager of field service for Toro Manufacturing, Minneapolis, Minn., told superintendents. Makers of equipment, he said, like to have problems taken care of early. This is important from the standpoint of customer satisfaction and as a product indicator to the manufacturer. Ames listed the following services to which a customer is entitled after purchase: (1) services of a competent company specialist; (2) analysis of a cus-

tomers' production goals, labor, and operating problems; (3) willingness to demonstrate; (4) pre-delivery assembly and adjustment; (5) post-delivery field adjustment and instruction; (6) responsibility for satisfactory performance; (8) an adequately equipped repair shop staffed with factory-trained personnel; and (9) periodic service after expiration of the warranty at the customer's expense.

#### **Your Front Door**

The friendliest gesture man can extend is an invitation to enter the "front door." This is the thinking of Warren Bidwell, golf course superintendent at the Philadelphia Country Club, Gladwyne, Pa. Speaking to the group, Bidwell pointed out, the moment a member or daily fee player enters club property, he should feel that he has just entered the front door of your club. Literally speaking, Bidwell told superintendents, your members should feel your very presence as though you are there to greet him personally. "This is done by your handiwork of fine grooming and finesse," he said. Here, Bidwell was referring to the entrance to the club, the actual setting of the clubhouse, and the grounds that surround it. This should make the so-called entrance hall appear as a classic piece of landscape architecture for the game of golf, and for all the other recreation facilities found at the modern day club.

Landscape architecture, Bidwell believes, should be likened to a giant mirror that ultimately reflects the personality of the superintendent. If used properly, it can serve as an introduction to the individual member. The "front door," Bidwell said, can be a great image builder for the superintendent. A good job of projecting this image can remind members that the superintendent is responsible for the beauty and enjoyment which members receive at the club.

## Determine Nitrogen Use Carefully In Tree Care

Nitrogen is the most important element in a "complete fertilizer" when determining fertilizer cost and rate of application.

Of the three basic components in a "complete fertilizer," nitrogen is the most expensive and has the greatest potential for burning a plant. It is, however, used in the greatest quantities and is the element to which woody plants respond most.

Jack Wikle, Davey Tree Expert Co., Kent, O., says that application rate of a "complete fertilizer" should be established on the number of actual nitrogen per unit area. It should not be based on amount per plant or inch of trunk area. This might cause damage to smaller plants or plants in areas where the root system is confined.

Wikle suggests an annual use of 4 to 6 pounds of nitrogen (from a high nitrogen fertilizer) per 1,000 square feet. This should be divided into 1 to 2 applications for trees, 2 to 3 for shrubs, and 3 to 4 for non-woody plants. If a woody low nitrogen mulch is used, such as sawdust or wood chips, the annual rate of nitrogen should be doubled.

On the practice of fertilizing trees and shrubs at planting time, Wikle reports he has not found concrete experimental data to support doing this. He suggests, only, that 3 to 5 pounds of super phosphate per 100 square feet be mixed with planting soil or back fill. Nitrogen or potassium should not be added until 6 to 8 weeks after planting.

Wikle presents four reasons for properly fertilizing landscape plants. They are: improvement of plant growth and vigor resulting in less dieback, more roots and more and darker green foliage; reduction of drought damage because of reduction in water requirement; reduction of disease damage due to increased

resistance to disease pathogens and insects which attack unhealthy tissues; and reduction of winter injury. An excess of fertilizer can increase damage.

## Turf Care Now Ranks 2nd in Pa. Agri. Business

Turfgrass has become a \$164 million business in Pennsylvania. According to a recent survey, turfgrass is now the second largest agricultural enterprise in the state.

Money, according to the survey, was spent to establish and maintain new turf areas. It included costs for hired labor, seed, sod, lime, fertilizer, irrigation equipment, and chemicals for control of weeds, insects and diseases.

H. Burton Musser, executive secretary of the Pennsylvania Turfgrass Council, says the survey, by the State Department of Agriculture, showed the turfgrass industry second only to the dairy industry.

Musser says golf course managers are the only turf specialists who make adequate use of chemical weed control. Neither herbicides nor fertilizers are used to their fullest benefit by most homeowners, Musser said.

The survey showed fertilizer costs for Pennsylvania home lawns to be \$5 million. Musser claims it would cost \$26 million annually to supply the minimum amount of fertilizer needed to maintain the turfgrass in good condition.

The survey also showed golf courses spent about \$14 per acre annually on weed control. The average for other areas like parks and home lawns was only \$1.60 on a per acre basis. Expenses were low for use of both insecticides and fungicides on general turf areas, including home lawns.

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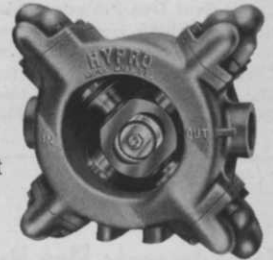
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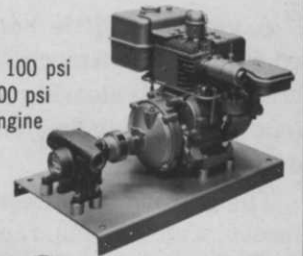
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Connecticut Tree Protective Association, Inc., elected officers at its recent annual meeting at the Hartford Hilton Hotel and began preparations for an active year. Shown seated, from left: Treasurer Bernard Wright, Danbury; Vice-president Thomas J. Williams, Cheshire Tree Service, Cheshire; President Kenneth L. Grimm, Walgren Tree Experts, Inc., West Hartford, and Secretary Charles Meli, Park Department, Hartford. Standing: J. Baylis Earle, park superintendent, Glastonbury (left) and Dr. Philip Rusden, Greenwich, editor.

## State Imports Flea Beetle For Alligator Weed Control

A voracious little bug imported from South America has been credited with clearing an obnoxious stream-clogging weed from a Florida river.

The bug is a flea beetle, a tiny insect which feeds rapidly and exclusively on alligator weed, one of several plants which plague Florida lakes and streams.

The flea beetle is about the size of a common ladybug. It devoured almost all alligator weed along a 45 to 50-mile stretch of the Peace River in Florida's Polk and Hardee counties.

Forrest Ware, fishery biologist for the Florida Game and Freshwater Fish Commission, said the weed had spread across as much as two-thirds of the river's width as recently as last spring.

"It's very impressive," Ware said. "The flea beetle hasn't been 100 percent effective in all areas in which it has been tried, but it

sure has worked in the Peace River."

The insects were brought into the United States by biologists involved in aquatic weed control programs of the U.S. Army Corps of Engineers.

After careful screening and testing by the Corps as well as the USDA to make sure insects were damaging only alligator weed, colonies were released at several weed-infested locations.

One was Lake Parker at Lakeland, in central Florida, where flea beetles were turned loose on unwanted aquatic growth during the spring and summer of 1966.

Last spring, Ware was placed in charge of a program designed to restore the Peace River from damages brought about by pollution from a slimepond break at a phosphate plant.

"That's when we saw the lush growth of alligator weed," he said. "Then, later, we saw the foliage turning brown. We investigated and found flea beetles were eating it."

Ware said he surmises the insects migrated south to the Peace from Lake Parker. None had been released directly on the river.

The biologist said alligator weed had previously been very difficult to control. Chemicals provided the primary method of attack.

The plant takes root anywhere from the edge of a lake or stream to a depth of about two feet. Stems grow to the surface and then move horizontally, intertwining to form a thick, almost impenetrable mat.

The plant breathes through growth extending some 12 to 18 inches above the water surface, and this is where the flea beetle comes in. He and his mates completely devour everything above water. The plant, in effect, drowns.

There has been no evidence anywhere in Florida to indicate the insect is attracted to or associated with any other plant, Ware said.

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against a wide variety of floating and submerged water weeds. Like water hyacinth, water lettuce, milfoil, elodea, coontail and many others.

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## Revision of Trees Book Now Available At OSU

A 127-page illustrated revision of the booklet "Ohio Trees" is now available. It is authored by F. W. Dean, L. C. Chadwick and William Cowen. The new revision covers more than 150 tree species, giving a species key and descriptions of genus and species. For information write to Dr. K. W. Reisch, 1827 Neil Ave., Columbus, Ohio 43210.

## Greater Drift of Spray With Small Droplets

Large spray droplets and calm weather are musts if contamination by spray drift is to be reduced.

Large drops naturally fall faster and more directly to the ground. Small droplets fall slowly and breezes carry them laterally. This causes the common damage problems.

Orrin Berge, agricultural engineer, University of Wisconsin, has pinpointed drift factors. He says that droplets the size of light rain will fall 10 feet in 2 seconds. These can be carried sideways only about 8 feet in a 3 mph wind. But particles the size of mist take a full 10 seconds to drop 10 feet in a 3 mph wind. These smaller droplets can drift 44 feet laterally in the 10 seconds they are airborne. Even smaller droplets, those the size of water vapor or fog need 17 minutes to drop 10 feet. This lets them drift almost a mile in a 3 mph wind.

Larger droplets are possible by use of a 10-gallon per acre nozzle size, rather than the 5-gallon size. Reducing the spray pressure will also increase the particle size. A pressure of 30 pounds per square inch is adequate for almost all weed and insect control work.

Berge cited other drift reduction procedures. He suggested lowering booms on sprayers to 2

feet above the ground and use of non-vaporizing sprays when possible. The ester forms of insecticides and herbicides are the most volatile. They are most likely to drift farther than the amine forms of chemicals. Whenever a choice is possible, the amine form should be used.

## Spraymen Assume Liability When Mixing Own Chemicals

Liability is assumed by the sprayman of a herbicide mixture if the mixture is not registered and labeled by a company. Conversely, if a manufacturer secures a government registration for a mixture he then becomes liable.

A sprayman may legally mix and apply a herbicide mixture containing chemicals which are registered individually, but he must then accept liability. Without a label, the sprayman will find difficulty in obtaining information on the rate of each herbicide and when to apply the mixture.

According to Dr. Richard Behrens, plant scientist, University of Minnesota, the advantages to be gained from mixtures are several. These include control of a larger variety of weeds, consistent weed control under various weather conditions, less chance of herbicide residue in soils, lower herbicide costs, and increased herbicide effectiveness.

## New Fruitless Olive Tree Imported From Australia

Horticulturists at the University of California, Davis, have adapted an ornamental "fruitless" olive tree. Grafting wood of the tree will be given to nurseries this summer for propagating purposes.

Foliage of the tree is the same as commercial varieties grown in

California. The underside of the leaves has the desirable gray coloration but the young stems are a little angular in shape instead of round.

Cuttings of the tree are difficult to root so propagation will be done by budding or grafting onto rootstock plants. Distribution of the grafting wood will be done by the Foundation Plant Materials Service Dept. of Viticulture and Enology, University of California.

The tree is to be named "Swan Hill" after the town in Australia where the original was found. Scion wood from this lone "fruitless" olive was brought to this country in 1960 by Hudson T. Hartmann, professor of pomology, UC.

## Herbicide Buildup Not Serious In Nurseries

A recent survey shows no serious buildup of herbicide residues in nurseries. Large herbicide buildups which might be expected from repeated applications did not materialize.

Leroy Holm, University of Wisconsin scientist, reports the continued use of simazine in a Connecticut nursery showed no harmful effects on yews and Euonymus shrubs. These shrubs had been used as indicator plants for 5 years. The use of a single chemical such as simazine, however, did invite the buildup of perennial weeds such as bindweed and vetch.

Established plants of Euonymus can have chemicals like simazine, diuron and neburon applied around them without hurting the plants. If they are removed and new plants placed in the herbicide-treated soil, the new plants may develop injury.

Sensitive plants such as Douglas fir, Arborvitae and Con-toneaster were not harmed when planted in a nursery in Wisconsin. In this case, the soil had been

treated annually for 5 years with applications of diuron, simazine and neburon.

In New York there was no important carry-over although herbicides had been applied 10 to 13 seasons.

According to Holm, other reports from the South and the West coast also gave the same evidence of no serious accumulation of residues.

### **New Booklet Available On Hydro-Mulching**

"Hydro-Grassing and Mulching," a new booklet geared to the industry, explains high speed grassing methods. Techniques employed on highway, levee, and airport sites are covered. These continue to be of increasing importance for residential, commercial and factory projects. For a free copy, write to: Reinco, Inc., P.O. Box 584, Plainfield, New Jersey 07061.

### **Understand The Label Know Chemical Contents**

Read the label, especially the fine print, when purchasing a pesticide.

Dr. Erick B. Nilson, pesticide safety specialist, Kansas State University, Manhattan, Kan., cautions that the one safe way to buy pesticides is by the active ingredient content. Thus, the label needs to be checked carefully. Nilson says trade names do not always identify the contents. Ingredients may be added or percentages of active elements increased without a trade name change. Containers of the same shape and color may hold chemicals with different active ingredients. A wide variety of pesticides may be packaged under the same trade name.

Nilson advises buying pesticides by the specific chemical needed.

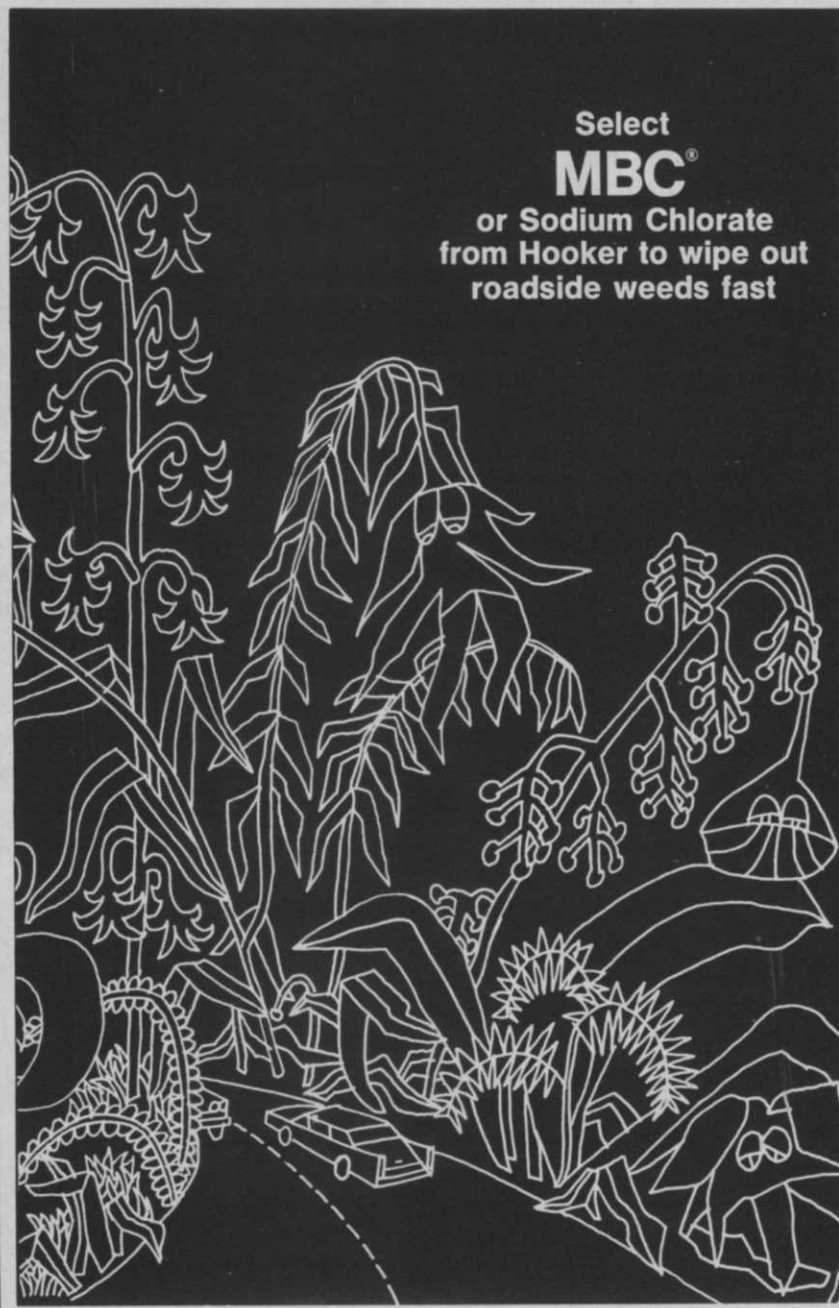
Clean up roadsides, ditches, or any noncrop land with MBC. MBC is a nonselective herbicide—spread or spray it on and it kills top growth almost on contact, leaches into the soil to attack roots, sterilizes soil for at least a season.

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

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

For more information on these powerful killers, write Agricultural Chemicals, Hooker Chemical Corporation, 404 Buffalo Avenue, Niagara Falls, N. Y. 14302.

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# Modern Irrigation System on 850 Acres Aids Quality sod Production At Emerald Valley

**E**MERALD VALLEY Turf Nurseries, Gregory, Mich., features production of cultured sod, now the fastest growing farm product in Michigan.

Besides management and marketing methods which rank with the best in the nation, this sod farm is blessed with muck, or peat, soil with an ideal surface drainage of one foot of fall per 1000 feet.

A system of drainage ditches with dam control units are used for sub-irrigation during dry weather periods. In addition, Robert Daymon, president of Emerald Valley, has developed one of the most modern and efficient irrigation systems to be found on sod farms.

Four miles of 10-inch underground pipe carry water from 3 giant, electrically driven deep well pumps. Water is pumped over 40 miles of quick-coupling surface pipe which can pour on irrigation water at the rate of 2½ million gallons per day.

By use of this irrigation system, fertilization, and other management plus factors, Daymon, on his peat soil, can insure quick



Electrically driven deep well pump is one of 3 used at Emerald Valley Turf Nurseries. Pumps can deliver irrigation water at rate of 2½ million gallons daily. Four miles of 10-inch underground pipe is used to carry supply to quick-coupling surface pipe.

seeding starts, hasten maturity on a quality crop, lift and market the sod, and reestablish a crop each year.

Daymon's father, Leonard A. Daymon entered the nursery business in 1919. The senior Day-

mon is now retired but two sons carry on the family tradition. Leonard, Jr., owns and operates a sod farm in suburban Detroit.

Sons, Robert and Glenn, purchased 514 acres of muck land near Gregory in 1959. Glenn is now deceased and Robert C. is sole owner. Of the 514 acres only 250 was tillable when purchased. Today Emerald Valley consists of 1350 acres, 850 of which is in sod.

Day-to-day operations of Emerald Valley are supervised by Farm Manager Richard Gorrell, from a modern air conditioned office and service building. Gorrell is always in instant communications with each foreman and all major equipment by a modern 2-way radio system.

A 4-place company plane

Irrigation insures quick seeding starts and speeds maturity of sod for Daymon on his 850 acres of peat soil. Sod is lifted for market and a new crop established every year.







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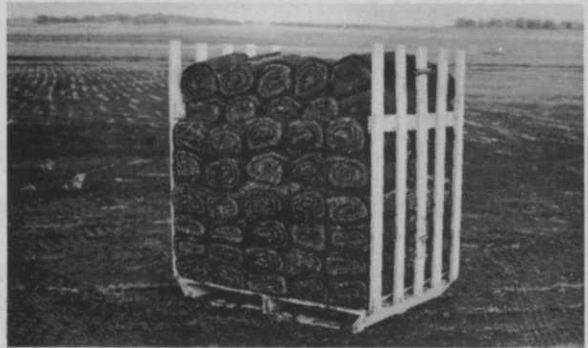
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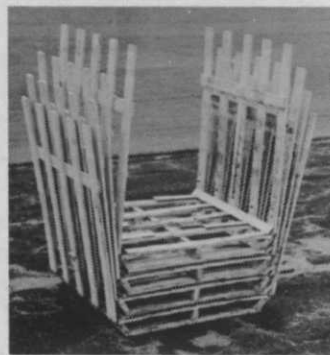
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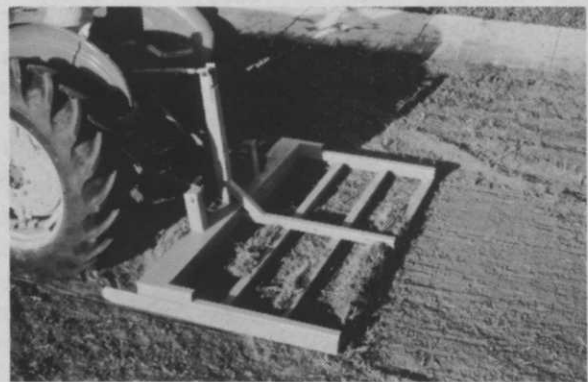
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Robert Daymon, left, and Dick Gorrell discuss operations. Modern office and service building is in background, company plane in foreground.

stands by to insure fast transportation to and from the market centers of the midwest.

However, in deference to the time, capital and technique that has been applied at Emerald Valley Turf Nurseries, the soil itself is a major factor in this success story. Muck or peat soil is very important in quality sod production in this area.

Though the sod business started in Michigan some 45 years ago, the "muck or peat soil" at Emerald Valley had its beginning many thousands of years ago. The muck ranges in depth from 8 to 35 feet. This highly organic black soil, known as muck, is the results of thousands of years of vegetation decay. It is so organic in nature that it is constantly changing, in fact, so organic it can almost be referred to as a living thing. Once only a swamp land of stagnant water, mammoth trees and rotting foliage, it was untouched and undeveloped for many lifetimes.

The first step necessary in the development of Emerald Valley was to drain the swampland by means of canals. Once the land was dry, trees, underbrush and roots were removed and the land leveled.

A successful sod farm must, by the nature of the product, be perfectly level. Each year after harvest, Emerald Valley land is

cultivated and many tons of tree roots are worked up from deep in the soil and carted away. Levelers are then used ahead of reseeded.

An interesting side benefit or plus in working with peat soil when cultivating sod is that a square yard of sod can be produced which is lighter in weight than that grown on mineral soils. In addition, such sod is easier to cut, handle and transport. It also has the additional benefit of a healthier and faster growth when transplanted, according to Daymon.

Emerald Valley Turf Nurseries cultures only a special strain of Merion Bluegrass. Once a field of sod is removed, the land is prepared, fertilized and seeded for the coming year. The stag-

gering of seeding throughout the year insures a constant maturity of each individual plat as needed to supply demand.

Each field is mowed three times weekly during the growing season. Special engineered wide metal wheels are designed to be used on all equipment which travel on the sod fields. (See WTT, February, 1968, Page 36.) These specially designed metal wheels also roll and level the field as the grass is mowed. The absence of tracks or ruts insures an even cut with the sod is harvested.

Daily harvesting of cultured sod begins with cutting and rolling of sod in either 1 or 1½ square yard rolls. A specially designed Sod Roller (See WTT, February, 1968, Page 37) has been developed at Emerald Valley during the past 5 years. It rolls up to 2000 yards per hour.

The Daymon Sod Roller not only rolls sod at Emerald Valley but is manufactured by Daymon Manufacturing Corporation and marketed throughout the United States and Canada.

Another unique development at Emerald Valley is a re-engineered truck tractor with 18-wheel drive. This unit pulls a 1500-yard load from the muck land regardless of weather or soil condition. A specially designed side loading conveyor which rolls freely along the trail-

Daymon uses 18-wheel drive truck tractor with side loading conveyor for trailer in moving harvested sod from field.



er bed expedites loading of each 1500-yard load.

Once out of the field, the 1500-yard loads are transferred to a fleet of company owned highway trucks for immediate transportation to landscapers, nurseries and garden centers throughout Michigan, Ohio and Pennsylvania.

It is not unusual for 10,000 to 15,000 yards of "Emerald of Michigan" sod to go into any one market on a given day.

The current development of Emerald Valley and its bluegrass sod along with the Daymon Sod Roller, side conveyor loader, special 36-inch wide tractor wheels, and special truck tractor attest to the imagination and ingenuity of Daymon and his staff.

Emerald Valley has also worked very closely with county agricultural agents throughout southeastern Michigan and with the Soil and Science Department at Michigan State University.

One high point at Emerald Valley was July 12, 1967, when Daymon and his staff hosted more than 100 university department heads, county agricultural agents and commercial sod producers from throughout the United States and Canada. Occasion was a Michigan State University-sponsored 2-day event at nearby Lansing, the better part of one day being spent at Emerald Valley.

### New Brushkiller Available For Spraymen

Diamond Shamrock Chemical Co., has developed a new brush control preparation, Diamond Special Brush and Weed Killer No. 345. A wettable powder, it contains non-volatile 2,4-D, DSMA (Disodium Methanearsonate) and a surfactant or wetting agent.

Diamond says it will control and suppress growth of many

weeds, grasses and brush normally controlled by either 2,4-D or DSMA plus surfactant. These include blackjack oak, bracken fern, brambles, chestnut oak, chokecherry, hazel, pine, pin oak, poplar, red oak, sumac, white oak, willow, and yellow birch.

For application, the powder is mixed with water (25 pounds per 100 gallons) and agitated continuously during preparation and application. The prepared liquid is applied as a drenching spray at a rate of 100 to 300 gallons per acre, depending on brush density.

The company suggests use of the new material on railroad and utility rights of way, roadsides, riverbanks, farm fence rows, and similar non-crop areas. Availability of the new product should help with the shortage of brush control agents brought about by government purchase of almost all 2,4,5-T produced in the U.S.A.



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John Nunes, left, John Nunes Mechanical Harvesting Co., Patterson, Calif., explains Nunes system of handling sod to ASPA group visiting his farm.



Three guests of Nunes at national ASPA event are, left to right: Hal Vogler, W. F. Miller Garden and Lawn Co., Birmingham, Mich.; William Johnson, Halmich Sod Nurseries, Brown City, Mich.; and Robert Hailey, Hailey Sod Farms, Omaha, Neb.

## American Sod Producers Discuss Industry At First Annual Meeting, San Francisco

Sod growers, meeting at San Francisco and for the first time as a national group, decided that grass is about the same color on both sides of the fence. In short, producers in every section of the country have their problems. These include narrowing profits coupled with rising costs, labor shortages, marketing, handling, and a host of lesser concerns.

Members of the American Sod Producers Association met in a separate session, but in conjunction with the annual turf conference and show of the Golf Course Superintendents of America. More than 70 attended the west coast session, several of whom were industry representatives. Ben O. Warren, Warren's Turf Nursery, Palos Park, Ill., expressed pleasure at the grower representation from all sections of the country, espe-

cially for their interest in this initial session.

A grower from each sod producing section of the country

outlined industry problems for his own area. Not too surprisingly, these proved to be largely common to the entire country.

Nunes sod harvester was demonstrated to ASPA group who attended San Francisco meeting. Harvester can be adapted to handle both rolled and slabbed sod in various sizes. Unit is sold by Nunes complete with special built Ford tractor.



Richard Horner, Horner Sod Farms, Wind Lake, Wis., observed that among the unique problems of sod are extreme weight and perishability. Selling price on a weight basis may amount to only 1¢ per pound. Further, he said, the goal is to get this product delivered up to 100 miles within 5 hours after receiving a call. In the midwest area, where he operates, near Chicago, Horner pointed out that the short season forces him to do 1% of the season's business in a single day. These are some of the rather unique management problems which face sod producers.

But problems do not end with the physical handling of the product. Horner found strong agreement among the group when he stated that there is an inability to get strong identification of the product, especially when sod is delivered in a truck other than that of the individual grower. Different levels of pricing also present a problem. Sod is sold in the field at a price too low to assure the grower a reasonable return, especially, in the face of rising costs.

**Ousley Represents Southern Sod Producers**

Representing southern growers, James E. Ousley, Sr., Ousley Sod Company, Pompano Beach, Fla., said that increased costs of land were forcing growers farther from the sale area. Produc-

tion costs are up, he said, and competent personnel to operate an extensive sod business are not available. Labor is also in short supply, Ousley said, and skilled help to handle machinery is almost impossible to obtain.

Ousley pointed out that in his area where sod is grown on sand based soil, sod can not be mechanically rolled because it will not hold together. This makes hand loading of pallets almost mandatory. Thus the labor problem is critical, especially when weekend help is needed. Drainage is another problem, he said, which is delaying a move to automation in harvesting of sod.

Ousley said that chinch bugs were becoming a greater problem; billbugs are also increasing. These latter entail expensive treatments for control.

Sod growers, according to Ousley, who own land rather than leasing land, and who are diversifying their operations seem to be making the most progress at the moment. He said that more bermudagrass is being grown as more golf course superintendents are using this when replacing sod. St. Augustine remains the big seller in the area.

Among marketing problems, Ousley mentioned that a lack of communications has existed among growers. Because of this, middlemen have been able to play one grower against another. This has led to pricing practices



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Pictured above is Mr. Ernest Willinger on his Turf Farm in Phoenix, Arizona, who has been using this unit all winter long, and reports that this rolling machine is "an absolute requirement for a grower with over 40 acres."

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Edward Mutoza, Nunes sales manager, visits with, left to right: Dr. Elwyn E. Deal, University of Maryland; Doyle Jacklin, Jacklin Seed Co., Dishman, Wash.; and J. L. Kidwell, Kidwell Turf Farms, Culpeper, Va.

which have forced some growers out of business. As a result, growers in Florida have recently decided to meet and discuss mutual problems and seek solutions as a group. Ousley said that there is a great need to educate the public on quality sod. An aid to sales is proving to be chain store distribution since such stores are adding sod as a line in many cases.

Speaking for the west coast sod industry was Tobias Grether, Cal-Turf, Inc., Camarillo, Calif. Grether said credit problems in dealing with landscapers was one of the major headaches. Another major problem in the California area, he said, is the need to provide a firm supply of 9 varieties, as Cal-Turf does, and to deliver sod at altitudes ranging from sea level to 6000 feet. This creates problems in handling the product for delivery.

Hurting the sod market on the west coast, Grether said, is the fact that the public has no real consciousness of sod. Concept of the product is generally unknown, and seems unique to the area. Less than 1% of Cal-Turf sales, according to Grether, come in over the transom. As a result, salesmen are needed to move the product, and the product must be kept high in quality.

#### Oversupply of Sod On Eastern Market

Wiley Miner, president of Princeton Turf Farms, Inc., Cranbury, N. J., said growers on the east coast are troubled with an oversupply of sod. People maintain land in sod which is being held for speculation. Miner pointed out that large, expansive fields for sod production are difficult to obtain in the New Jersey area because of the pressure

for land. Miner said Princeton's largest field was 140 acres and that their sod is cultivated on 16 farms which stretch over a 22 mile area. In Maryland, however, he said, the corporation does have large fields.

Miner feels that the sod industry needs guidelines and standards. He believes growers would gain by being able to provide the landscape architect a set of uniform specifications. This, Miner told growers, might help build and hold the market. He called on the group to "dig in" and to make ASPA a working organization.

Growers met only on Feb. 21 in a formal session. Most of those present, however, accepted the invitation of John Nunes to visit the Nunes sod farm at Patterson, Calif., on the following day. This turned out to be a highlight of the first annual session. Nunes demonstrated harvesting and other equipment used in his operation.

Officers and directors who were elected at the July 11, 1967, East Lansing, Mich., organization meeting were reelected to serve an additional term. President is Ben O. Warren, Palos Park, Ill. Vice-president is Robert Daymon, president of Emerald Valley Turf Nurseries, Howell, Mich. Elected treasurer was Louis DeLea, Louis DeLea & Sons, East Northport, Long Island, N. Y.; and secretary, Richard Horner, Horner Sod Farms, Wind Lake, Wis. Other members elected to the 7-man board besides the officers were: Tobias Grether, Cal-Turf, Inc., Camarillo, Calif.; J. E. Ousley, Sr., Ousley Sod Company, Pompano Beach, Fla.; and Wiley Miner, Princeton Turf Farms, Inc., Cranbury, N. J.; George B. Hammond, Paint Valley Bluegrass Farm, 71 E. State St., Columbus, O., continues as executive-secretary. The group voted to again hold their annual meeting in conjunction with the GCSAA.

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## INTERIOR LIVE OAK (*Quercus wislizenii*)



Picture from: Murman Slide Collection, Library,  
Univ. of California at Los Angeles

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

Interior live oak (*Quercus wislizenii*) occurs on mountain slopes below 5000 feet and valleys from Siskiyou County, Calif., southward through the Coast Ranges, the Sacramento Valley, and the Sierra foothills to northern Baja. The tree forms are often in woodlands containing other species of oak and digger pine (*Pinus sabiniana*). The scrub varieties are generally present in chaparral. The genus *Quercus*, a member of the Beech Family or Fagaceae, is divided into two large groups, white oaks and black oaks. Interior live oak belongs to the latter. In all, there are about 450 species of oaks

which are widely distributed in the northern hemisphere and into the mountains of the tropics.

Interior live oak is an evergreen tree from 30 to 70 feet tall, with rounded top and smooth bark which becomes furrowed with age. The leaves are mostly oblong, varying from elliptic to lanceolate in shape, with blades from  $\frac{3}{4}$  to 2 inches long and petioles about  $\frac{1}{4}$  inch long. They are firm, with either smooth or spiny edges, and glabrous and shining both above and beneath. The flowers are small, without petals, green or yellowish, and unisexual, with the staminate and pistillate on the same plant. The acorns are oblong, ovate, sharp pointed, from  $\frac{3}{4}$  inch to  $1\frac{1}{4}$  inches long,  $\frac{1}{4}$  to  $\frac{1}{2}$  inch thick, and with scaly cups. Like all black oaks, they mature during the second autumn.

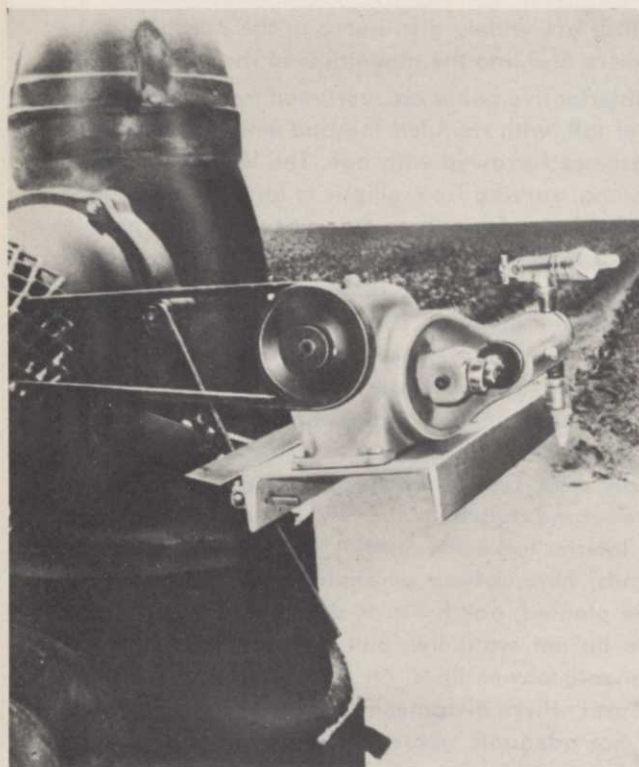
Interior live oak control is wanted most on rangelands; here, where perennial grasses and clovers are planted, oak brush is detrimental. Then again, we do not want live oak trees or brush growing beneath power lines, on rights-of-way, or close to houses where it creates a fire hazard. Where water is not adequate, more water can be made available by clearing or partially clearing watersheds. Since live oaks constitute important members of the watershed, their removal can be highly beneficial, as water not used by the trees becomes available to the people who live in the area.

There are several methods of killing interior live oak trees or brush. One practical method for killing trees is to make cuts closely spaced around the bases of the trunks and to apply an amine form of 2,4-D to the cuts. Winter is the best time to make such applications. Smaller stemmed trees and brush can be sprayed basally using brush killer mixtures of 2,4-D and 2,4,5-T alone, in oil. The basal parts of the stems must be thoroughly soaked to obtain results. The most effective time to make these treatments is early spring.

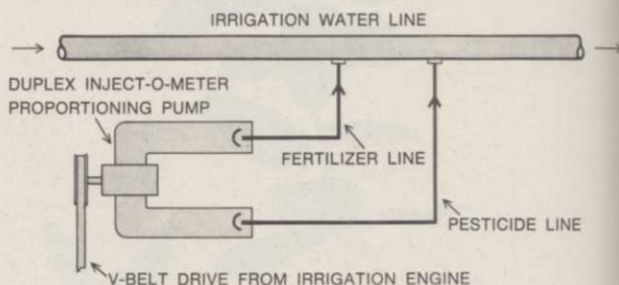
It is most desirable to burn areas prior to killing the live oak. The sprouts can then be killed by repeated applications of brush killer or silvex; the latter is often more effective. Current evidence suggests that picloram added to other phenoxys often gives a better kill than other methods. Aircraft applications have been effective in giving top kills, but results in poor root kills. Another approach has been to place 2 ounces of 25% fenuron pellets at the base of each group of sprouts in the winter; under this method, killing will take place slowly and may continue for 2 to 4 years.

# New Products . . .

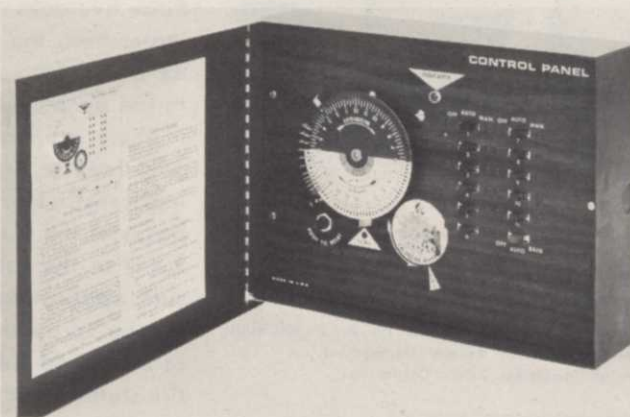
# Designed for the Turf Irrigation Industry



Metered amounts of fertilizers, herbicides, pesticides, or fumigants can be applied simultaneously by means of adjustable output, Model 67-JP "proportioning pump." Offered by Inject-O-Meter Manufacturing Co., Box 1044, Clovis, New Mexico, pump can operate by means of a V-belt from the drive shaft of an irrigation engine (see photo), or with its own separate electric motor. Widely used for controlling liquid feeds of treatment chemicals in industrial plant operations, the proportioning pump provides a dependable method of accurately regulating the proportion of liquid additive to irrigation water. Simplex Proportioning Pump with V-Belt drive, left, and schematic diagram showing how proportioning pump (duplex) meters fertilizer and pesticide into irrigation water line, below.



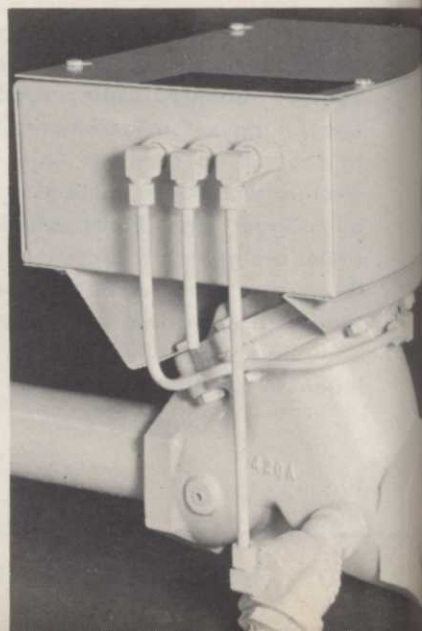
Toro's new "Vari-Time" Control System has a central control (top) which signals satellite controls electrically. The satellites (each controls 11 stations) then send hydraulic (or electric) signals to open and close all valves. Only three central controllers are required to signal an entire golf course sprinkler system for automatic or semi-automatic operation, or by-pass, as the weather dictates. Toro Manufacturing Corp., 8111 Lyndale So., Minneapolis, Minn. (See pictures below).



Executive 11 & 5-station automatic sprinkler controller has a 14-day calendar wheel for automatic round-the-clock operation. Variable timer permits programming of water zones to specifications. Write: Turf Irrigation Corp., 517 Atlantic, Freeport, N. Y. 11520.



Non-electric timer controlled irrigation valve, incorporating numerous new engineering features, has been introduced by Test Corporation, P. O. Box 566, Ashland, Ohio. Valve is completely automatic and operated by water pressure in main line. Time control will rewind itself and can be programmed to open the valve automatically any time during the day or night. Watering duration is adjustable from 10 minutes to 1 hour as often as required. New valve has application in automatic irrigation where no electric supply is available.





# Classifieds

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

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

## FOR SALE

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

## FOR SALE

**IOWA BOOM unloader, standard model, less bed, new expanded upright, newly rebuilt, cleaned and prime painted, \$2300.** Minn Turf Equipment Corp., 7100 France Avenue, South, Edina, Minn. 55435.

**NATIONAL 72-inch riding reel mower, Mott 24 inch self-propelled hammer knife mower.** All in excellent condition. Lake View Memorial Gardens, Belleville, Illinois 62221.

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

**1965 BEAN 301 Roto-Mist, 300 hours use.** A-1 condition. Paul VanderMass, 4970 Cascade Rd., SE, Grand Rapids, Michigan 49506. Phone 949-4168.

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

## HELP WANTED

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

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## Meeting Dates



**National Pollution Control Exposition and Conference**, Houston Chamber of Commerce, Astrohall, Houston, Tex., April 3-5.

**Florida Turfgrass Trade Show, Florida Turfgrass Foundation**, Jack Tar Harrison and Belleview - Biltmore Hotels, Clearwater, Fla., April 24-26.

**Keystone State Association of Cemeteries, Spring Convention**, Shawnee on the Delaware, June 9-12.

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

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

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

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

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

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

**Lawn and Ornamentals Days**, Ohio Agricultural Research and Development Center, Wooster, Ohio, September 10-11.

**1968 Southern California Equipment and Materials Educational Exposition**, City Park, Lynwood, Calif., October 16-17.

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

**Weed Science Society of America, Annual Meeting**, Las Vegas, Nev., February 10-13.

## Only By Chance Do Bark Beetles Locate Elms

Scientists have found insect-feeding stimulants and deterrents in the bark of some trees. Most important is the chemical in the American elm which stimulates bark feeding by the European elm bark beetle, transmitter of Dutch elm disease fungus.

The scientists also discovered that the beetles are not actually attracted to healthy American elms as was previously believed. Instead, beetles feed on the elms only when finding them at random in their flight. If the beetles land on non-host trees, they are deterred from eating by a chemical in the bark. They continue on until they find an American elm.

Both discoveries, according to the researchers, will have great significance in control of Dutch elm disease. They also provide information about the probable nature of chemical communications between many other insects and their perennial host plants.

University of Wisconsin scientists, Dale M. Norris, James E. B. Baker, B. M. Trost and Barry L. Gilbert, have isolated the chemical stimulant, pentacyclic triterpene, from the bark of American elms. A deterrent chemical, juglone, has also been isolated. Juglone keeps the elm bark beetle from feeding on the bark of shagbark hickory, a non-host tree. It does not, however, stop the hickory bark beetle from feeding on the shagbark hickory.

Chemical deterrents to elm bark beetle feeding have also been found in white oak. The researchers expect there are deterrent chemicals in most, if not all, non-host trees.

Norris says his group will attempt to protect important trees from insect attack by altering the taste of the trees and thus confusing the insects.

## Trimmings

**Forest of Fifty.** Each state is represented by its official or otherwise favorite native tree in a unique planting near Portland, Ore. The Oregon Association of Nurserymen has established a 50-tree forest of state trees just south of Portland at a rest area on the Baldock Freeway. The site is near the Hubbard Interchange. Trees are small as yet, since the young forest was established just more than a year ago. The first grove of 13 trees represents the original 13 colonies. Then come state trees by sections of the country. This is a tribute to the national beautification program and an honor to each state, thanks to Oregon's progressive nurserymen.

\* \* \*

**Green Seed Marks the Trail.** Embankments on the interstate highway through Salt Lake City, Utah, have been planted with dyed grass seed sprayed on with a hydroseeder. Green dyed seed serves as a marker for workmen who can easily spot the areas covered.

\* \* \*

**Trial By Students.** Colorado State University is establishing a research green for student use. A 10,000 square foot area near the Student Union will be used in the hope that heavy student traffic will simulate golf course conditions. Idea is to research methods for establishing superior greens. Agronomist R. E. Danielson is also seeking US Golf Association support for funds to research soil matrix needs for turf maintenance under heavy recreational use.

\* \* \*

**We goofed.** Our apologies to Hercules, Inc. and Evan Swartz. We ran an interesting article in the March WTT on the use of invert sprays for improved spray drift control. Author Swartz, director of the Noxious Weed Department at Shawnee County, Kan., related his experiences with Visko-Rhap used for roadside spraying. We tagged the article with a headline which said "thickeners" when we should have said "Use Invert Sprays."

\* \* \*

**Good News for the Industry.** The University of Delaware Research Foundation has just released a report stating that herbicides used in farm and industry are not contaminating ground water. E. M. Rahn, horticulturist at UD, reports also that herbicide residues appear in small amounts in surface runoff water only under unusual condition. Highly sensitive detection methods to analyze ground and surface water were used on periodic samples from fields treated with atrazine and trifluralin, and from an industrial area treated with enough bromacil to control vegetation for a period of years. No trace of herbicides was found in ground water seeping into nearby drainage ditches or streams. Surface runoff showed only 10 parts per billion, which is about 100 times less than the amount considered harmful to plant or animal life.

## Insect Report

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

### ORNAMENTALS

#### APHIDS (*Aphis* spp.)

**Alabama:** *A. spiraeola* eggs hatching on spirea plants in central and southern areas throughout winter; adults not abundant. Nymphs increased to 10-25 per branch tip in Lee county due to higher temperatures and more sunlight hours. **Arizona:** *A. spiraeola* heavy on young tip growth of many pyracantha plantings in Phoenix area, Maricopa County. *A. nerii* heavy on oleander terminals in Yuma, Yuma County.

#### PEA APHID (*Acyrtosiphon pisum*)

**Arizona:** Heavy on untreated snapdragon plantings in west Phoenix area, Maricopa County.

#### TULIP BULB APHID (*Dysaphis tulipae*)

**Alabama:** Heavy in several packages of iris bulbs shipped from an out-of-state nursery; moisture loss to bulbs and thousands of dead and dying aphids resulted.

### TREE INSECTS

#### WHITE-PINE APHID (*Cinara strobi*)

**Maryland:** Eggs heavy on white pine needles at Bel Air, Harford County.

#### BARK BEETLES (*Dendroctonus frontalis*)

**Maryland:** Killed isolated loblolly pines in Worcester and Somerset Counties.

#### (*Ips* spp.)

**New Mexico:** Killing ponderosa pines at Los Alamos, Los Alamos County.

#### DOGWOOD BORER (*Thamnosphenia scitula*)

**Alabama:** Larvae active on warm days on dogwoods on lawns and streets in southern and central areas; some pupation evident.

#### EASTERN TENT CATERPILLAR (*Malacosoma americanum*)

**Alabama:** Egg clusters light, 0-3 per tree, on isolated cherry trees in Lee County; no hatch to date. Some egg masses partially destroyed, probably by birds.

#### AN ARMORED SCALE (*Hemiberlesia lataniae*)

**California:** Moderate on palm nursery stock in Fallbrook, San Diego County.

#### PINE NEEDLE SCALE (*Phenacaspis pinifoliae*)

**Alabama:** Very light on few loblolly and slash pine plantings in Lee County; lighter in area than in most years.

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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The Ryan Sulky Roller attaches quickly and

easily to your Ryan heavy duty Sod Cutter with six bolts into six existing holes. It operates efficiently in all soil conditions. The single operator can harvest over ten thousand yards of sod per day.

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