

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.

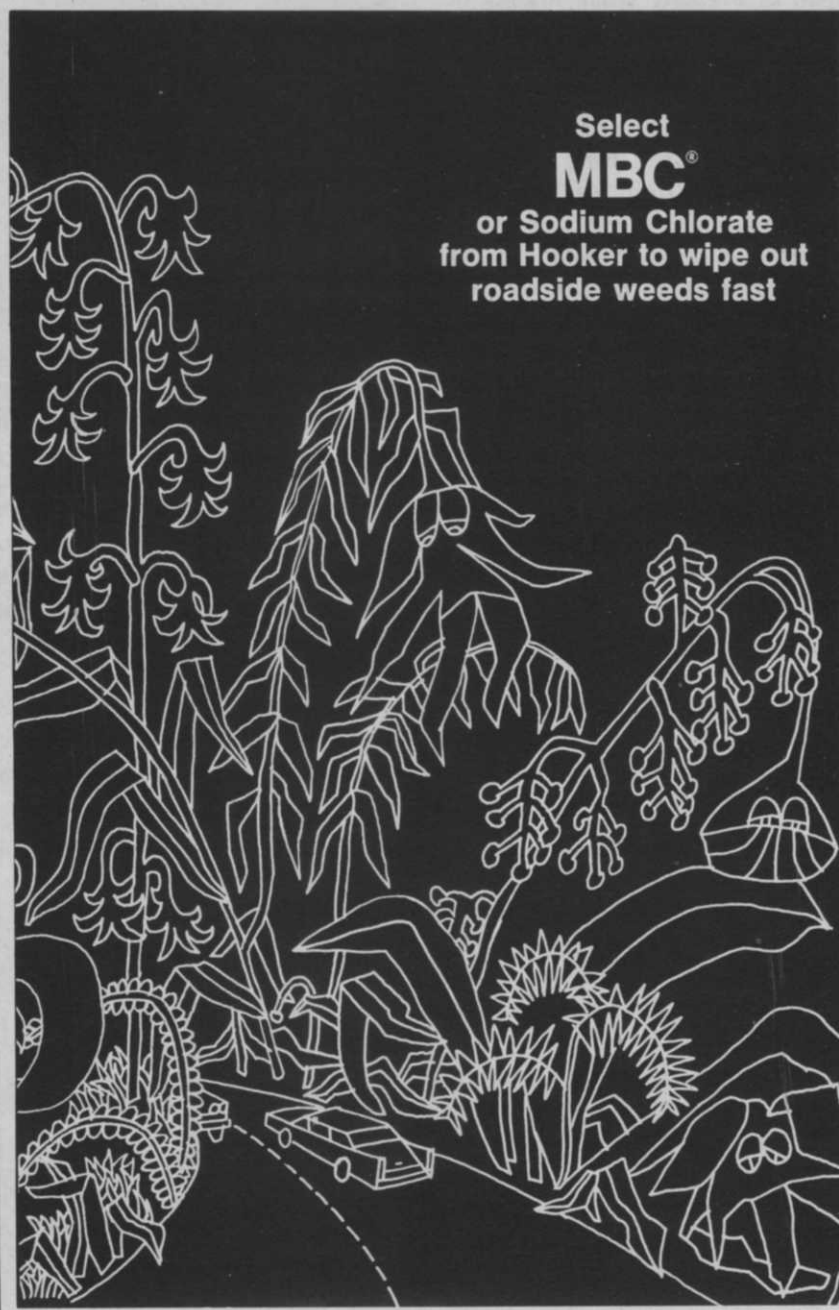
Clean up roadsides, ditches, or any noncrop land with MBC. MBC is a nonselective herbicide—spread or spray it on and it kills top growth almost on contact, leaches into the soil to attack roots, sterilizes soil for at least a season.

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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

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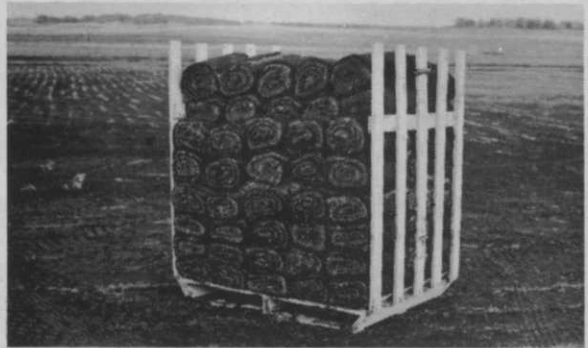
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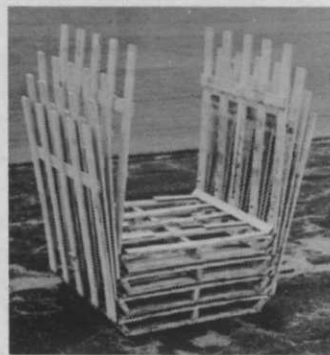
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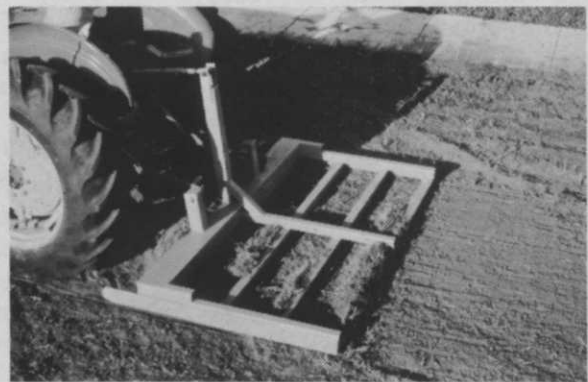
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Robert Daymon, left, and Dick Gorrell discuss operations. Modern office and service building is in background, company plane in foreground.

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.

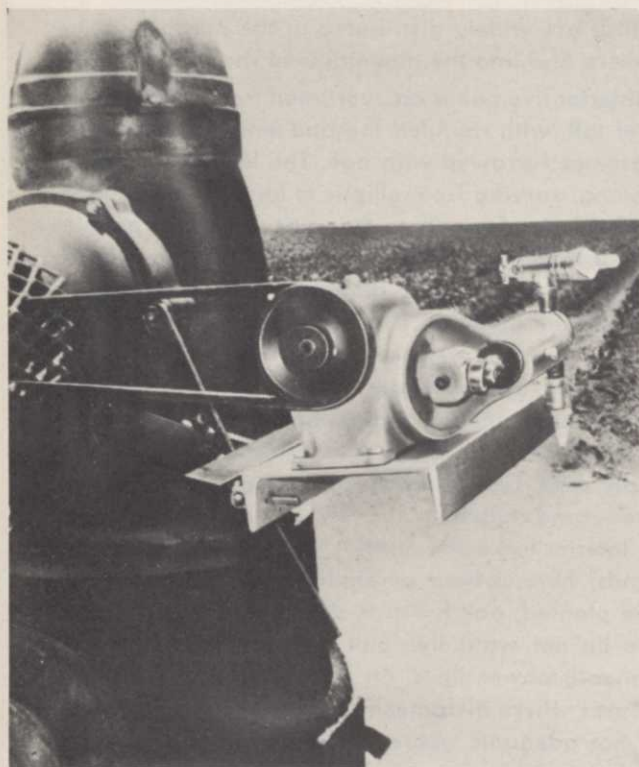
Interior live oak control is wanted most on rangelands; here, where perennial grasses and clovers are planted, oak brush is detrimental. Then again, we do not want live oak trees or brush growing beneath power lines, on rights-of-way, or close to houses where it creates a fire hazard. Where water is 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.

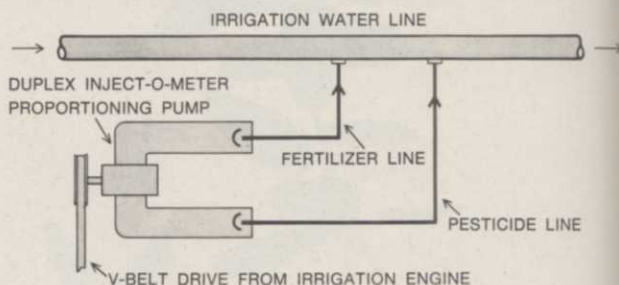
It is most desirable to burn areas prior to killing the live oak. The sprouts can then be killed by repeated applications of brush killer or silvex; the latter is often more effective. Current evidence suggests that picloram added to other phenoxys often gives a better kill than other methods. Aircraft 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 . . .

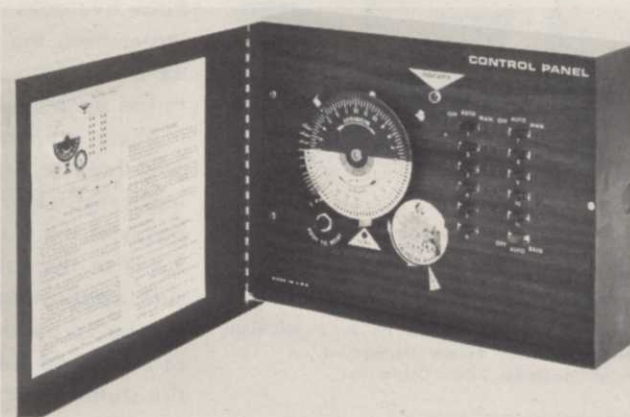
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Metered amounts of fertilizers, herbicides, pesticides, or fumigants can be applied simultaneously by means of adjustable output, Model 67-JP "proportioning pump." Offered by Inject-O-Meter Manufacturing Co., Box 1044, Clovis, New Mexico, pump can 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.

