

trials and tribulations of developing a new golf course and the many factors to be considered when building a course. Gipson pointed out that the most important item necessary to efficient construction is a dedicated and experienced working crew. Mike McMullen, Eastern Rainbird Sales Corp., traced the developing trends in golf course irrigation from the sod cup to the two-wire automatic irrigation system.

The conference consisted of nine, one-half day sessions, each presenting a major theme. One entire session was devoted to Dr. W. H. Daniel's and Purdue's exclusive development, the Purr-Wick system (Plastic Under Sand Reservoir Root-Zone). The system uses the principle of capillary (wick) action to water grass. Plastic is used at the base to contain moisture. This section included eight testimonials from turf specialists and a golf course superintendent on the success of the system in applications ranging from golf course greens to flower beds.

Paul Morgan, superintendent of Brown's Run Country Club, Middleton, O., shared his fairway problems with the conference delegates Wednesday morning. He pointed out the values of proper seed selection and fertilizer application for growing and maintaining desirable fairways. Len Hazlett, Jr., superintendent of the Country Club, Inc., Cleveland, O., described his procedure for ridding his course of most of its poa annua.

The annual banquet highlighted Tuesday evening and featured the rousing harmonies of the Purdue Glee Club. Four Purdue turf students received scholarships totaling \$1,300 at the affair. Recipients of the Golf Course Superintendents Association of America scholarships worth \$500 each were Kenneth R. Griepentrog and Douglas J. Meadows. Randal Bellinger received \$200 and Alan Nees was presented \$100.

Elected 1974-75 officers of the Midwest Regional Turf Foundation were O. Lee Redman, superintendent, Bellerive Country Club, St. Louis, president; John Spodnik, superintendent, Westfield Country Club, Westfield Center, O., vice president, and W. H. Daniel, Purdue turf specialist, executive secretary (re-elected).

New directors are John C. West, Little Turtle Country Club, Columbus, O.; Danny K. Quast, Milwaukee Country Club, Milwaukee, Wis.; Harry Murray, Century Toro, Cincinnati, O., and Robert L. (Pete) Cahill, Summit Hills Golf Course, S. Ft. Mitchell, Ky. □

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Gyro 72	6' Heavy Duty	Pull/Lift	Yes	Yes
Cyclone 72	6' Heavy Duty	Pull/Lift	Yes	Yes
Saturn 6	6' General Duty	Pull/Lift	Yes	No
Gyro 60	5' Heavy Duty	Pull/Lift	Yes	Yes
Cyclone 60	5' Heavy Duty	Pull/Lift	Yes	Yes
Saturn 5	5' General Duty	Lift Only	Yes	No

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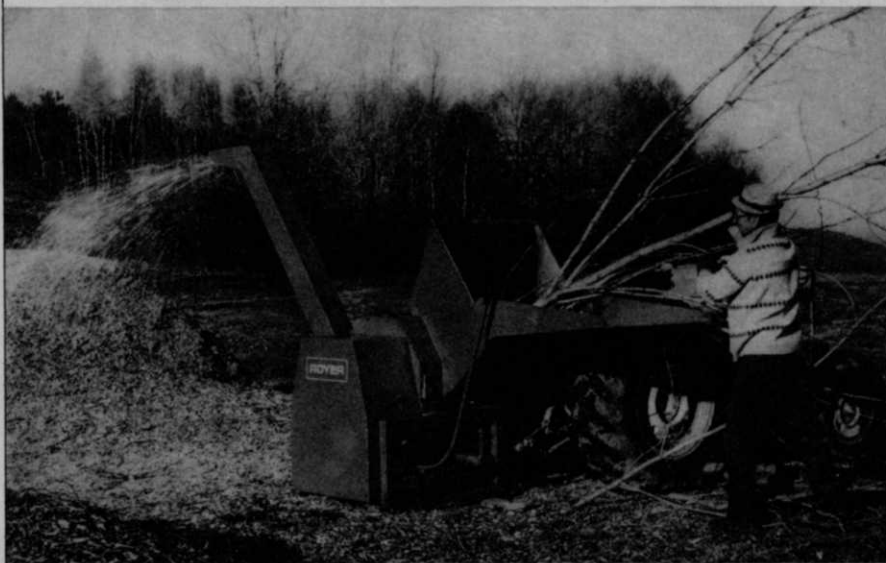
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**Patent pending*

SPRINKLER IRRIGATION

(from page 34)

were only so many dollars allocated.

Dr. Smerdon did include in his remarks on energy conservation practices the idea that alternative energy sources were being investigated. He referred specifically to nuclear fission, fusion, and solar energy as possibilities.

There are three barriers which we must overcome, reported Charles A. Rothfus, executive vice president, Colorado Petroleum Council. First we must accept the fact that there is a shortage of energy. Second, we need enlightened leadership. Third, we have long cherished the role of being bigger and better than those other people in the world. This role is now changing.

Rothfus lead the audience into a clearer meaning of what is meant by the energy crisis. "We are not out of oil," he said. New oil is being found daily. "Second, we have an energy crisis not because what happened, but because what didn't happen." The Alaskan pipeline was delayed. Leases for oil exploration on the continental shelf were tabled. New refineries were not built. Uses of coal were not developed due to environmentalist pressure. Nuclear plants were not constructed because of environmentalists.

He said that in the short range we must continue to rely on gas and oil heavily. This includes completing the Alaskan pipeline, drilling on the continental shelf, attracting capital, developing increased refining capacity, and building deep water ports for foreign oil.

What about the long range? Rothfus had answers for this too. He said we must rely on coal, nuclear power, solar energy, geothermal energy and breeder reactor energy. He pointed out that there is a three to five year lag between the initial "go" signal and the "on stream" status. "The barrier between new supply and where we are is a people barrier," he said.

Other discussions on the energy situation were given by Dr. Clair Batty, Utah State University, and David A. Witts, a Dallas, Texas attorney.

One of the interesting discussions in the afternoon lineup was a speech by James W. Ball, research associate, Colorado State University. Mr. Ball, who is twice retired and now actively working on his third career, discussed, "Problems Encountered with Entrapped Air."

Through a series of slides and
(continued on page 46)

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THE ENERGY CRISIS

(from page 16)

be changes in working hours to fit car pools, bus or train schedules. This could have an impact on the number of hours as well as the time of day, or night, that customers will use a given turf facility," he reasoned.

There will be greater emphasis on total cost of equipment operation. This will take into account not just the initial cost, but the cost of parts and service, down time, labor and other operating costs. In short, the emphasis will be on all factors determining the cost of work performed by a given piece of equipment.

In the near term, the environmental emphasis may become secondary to efforts to develop and utilize fuels more efficiently.

He said the shorter work week is already a reality in some industries, and is likely to spread to others. There may be rearrangement of working hours. All of which will lead to more leisure and greater utilization of facilities closer to home.

Dr. Watson called on the turf in-

dustry to move toward an understanding and utilization of the metric system. "We are one of the few nations who have not adopted this simple system. We cannot stand alone and expect to compete internationally, nor can we survive as isolationists, although we may desire to do so."

The need for improvement of managerial talent will become more critical as the need for control and analysis of all operational procedures increases.

"All that has happened in the past few months and all that will happen in the upcoming months can mean nothing but increased opportunity for all concerned with the turfgrass industry. The production and maintenance of good turf facilities is a vital and necessary part of our way of life," Dr. Watson concluded. □

Japanese Beetle Quarantine Extended In Six States

The U.S. Department of Agriculture (USDA) is enforcing Japanese beetle quarantine restrictions on the movement of certain agricultural items in seven new counties in four

states.

Leo G. K. Iverson, deputy administrator of USDA's Animal and Plant Health Inspection Service (APHIS), said the action was taken after the discovery of Japanese beetles in Vermillion county, Ind.; Auglaize county, O.; Chesterfield and Horry counties, South Carolina; and Campbell, Knox, and McMinn counties in Tenn.

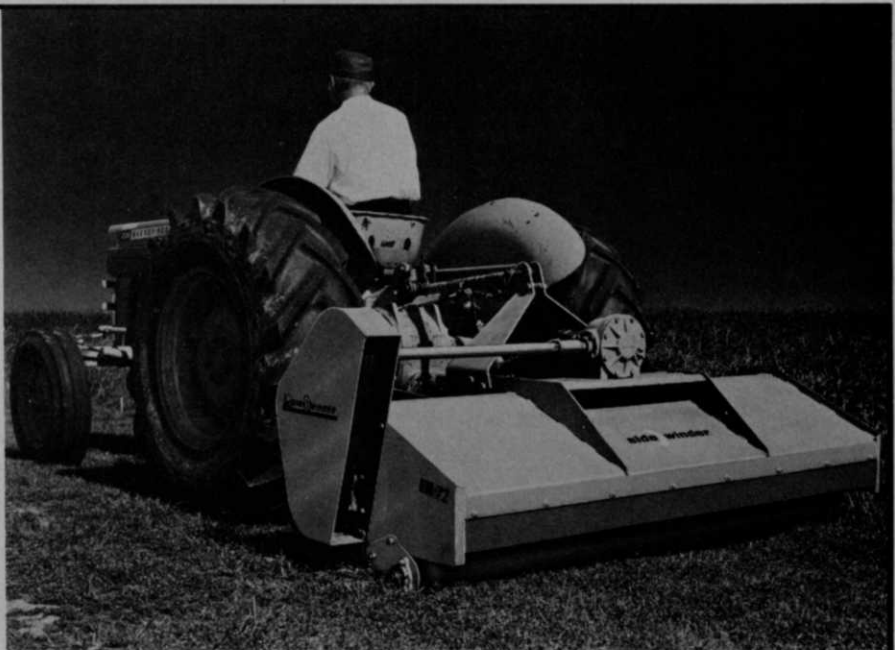
Meanwhile, quarantine restrictions are being extended to additional areas recently found infested within the following counties, which are already being regulated: Cobb, DeKalb, Elbert, Fayette, Fulton, and Henry in Ga.; Coles and Iroquois in Ill.; Clay, Clark, Montgomery and Greene, O.; Parke, Putnam, and Sullivan in Ind.; Darlington in S. C.; and Greene, Monroe, Polk, and Washington in Tenn.

Quarantine regulations restrict the shipment, from infested to uninfested areas, of articles that might carry "hitchhiking" Japanese beetles. Such articles as plants with roots, grass sod, bulbs, etc., may be moved only after being inspected, treated (if necessary), and certified "pest free" by an APHIS or cooperating state agricultural inspector.

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THE NAVY'S ROLE IN WEED CONTROL

(from page 24)

ing Command, Charleston, South Carolina, known as an engineering field division (EFD). We accomplish the planning, design and construction of public works and public utilities. We also direct and administer the maintenance and/or operation of family housing facilities, utilities, and transportation.

When I wear my weed control hat, I provide professional consulting service on the control of undesirable vegetation on improved or semi-improved land, usually involving herbiciding, and chemical or mechanical control in unimproved areas. Our office or Applied Biology has the responsibility for herbicide application, including approval of requisitions for herbicides and application equipment, and the preparation of technical portions of contract specifications. This includes the consultation and liaison on problems involving pesticide toxicity, handling or storage of materials, and the guidance of related station application operations for maximum efficiency, economy and safety in applying herbicides.

To cite an example of the need for my review and approval of herbicide requisitions, one station submitted a requisition for 10,000 gallons of a material containing less than 2% active ingredient, the rest being petroleum oil, and costing \$47,500. Not only would the material not have accomplished the desired results, but the petroleum oil would have produced the environmental pollution and fire hazard they were trying to avoid. Furthermore they had no hydraulic equipment to apply it. The recommendation had been made by persons not trained in weed control, and neither our advice nor that of their own well-trained and certified pest control crew had been sought before submitting the requisition. We came back with a recommendation for a much more effective and safer material, effecting a many thousands of dollars savings, and for which they had the proper application equipment on hand.

Our second line of defense is the Department of Defense requirement that all pest control work be reported each month to us for review and submission to the Armed Forces Pest Control Board.

The man with the hoe and brush-hook is gradually being replaced in Navy weed control by the man who

is qualified to apply herbicides. With chemical control, personnel can select a material which will prolong results, thus reducing their labor costs.

Each year more maintenance supervisors are being made aware of the substantial improvement potential in weed control by chemical means and fund it in their annual budget. During a recent fiscal year, we approved 2,570 gallons and 527,128 pounds of herbicide concentrates for application in the Sixth and Eighth Naval Districts, but through our insistence on trained, certified persons to use and apply these materials judiciously, we can be justifiably proud of the Navy pesticide safety record.

Here are some of the ways the Navy is involved in weed control:

1. To prevent damage to asphalt pavements. As with any municipality, we have many parking lots, tennis courts and sidewalks that are expensive to maintain unless a bare ground material is incorporated in the base course. In addition, we have such unique features as drill fields and airfield runways that require similar treatment. We select the most appropriate herbicide for the particular job from among the many products on the market.

2. To eliminate the fire hazards. Areas we keep free of this hazard include: ammunition, lumber and fuel storage areas, around power poles and communication lines, and under wooden bleachers in noncultivated areas. In this regard, we are not very different from similar situations in industrial areas in the civilian community.

3. To improve visibility. This is of vital importance around airfield guidelights, as well as utility lines and antennas. Our annual on-site reviews are stressing this important application to airfield commanding officers.

4. To reduce mosquito breeding areas in drainage ditches, sewage oxidation ponds and lakes. There have been considerable man-hour savings in mosquito fogging and spraying operations through good aquatic weed control programs, with the additional benefit of opening up such areas for recreation.

5. To improve turf for appearance and durability. With the increasing emphasis on recreation and land use, the Navy is right up in the forefront in maintenance of lawns, golf

courses and athletic fields. Our land-based sailors are being provided more recreational facilities on base, and the family housing areas are receiving more emphasis on landscaping. With some of our stations supporting more than 1,500 family housing units, we have had to go contract for some kinds of pest control. The occupants have certain responsibilities in this area, but we discourage their use of any but the lowest percentage pesticides.

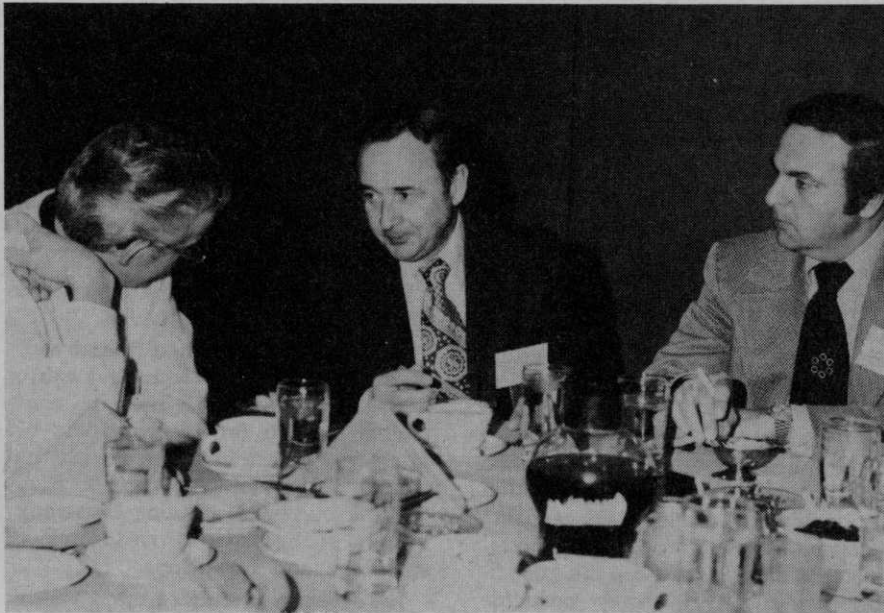
6. To maintain the health and welfare of personnel. Weeds that cause allergies or dermatitis must be controlled. In the far western part of our area, we are concerned with the control of scrub vegetation around the perimeter of stations that may harbor such pests as rattlesnakes, scorpions and tarantulas.

7. To conserve underground water in dry riverbeds by mechanical means. Again in the far west, we have what is known as phreatophytes, or "pump" plants, which take more water from the ground than they need. Through the process of transpiration, plants such as salt cedar, willow, sycamore, tules, bermudagrass and alfalfa appreciably lower the water table.

At a large Marine desert camp, where water supply is critical, units involved in the training effort of operating bulldozers clear enough plants and trees from the creeks and river beds to effect an annual ground water savings of 652,000 gallons (2 acre-feet) for each acre cleared. Recent tests using selective herbicides have shown promise in the control of phreatophytes in dry river beds.

8. To reduce the number of man-hours in trimming grass around sprinkler heads, fireplugs, and other mowing obstructions, and chemically edging lawns. At four Naval activities on the West Coast, approximately \$12,500 per year are saved in labor alone by chemically treating around 15,700 sprinkler heads on an average of four times a year. Plant growth inhibitors are now being tried experimentally at some activities. If these show promise, station maintenance costs of lawns.

From the foregoing, I think it can be seen that we in the Navy are not too much different from our civilian community counterparts in the complexity of our weed control problems and in our solutions. Perhaps the big difference is our "fish-bowl" image and our sincere desire to save the taxpayer dollars through a minimum of manpower effort with a maximum of results. □



Much of the discussion centered around energy. Interest was expressed in using plant material — possibly even water hyacinths — as energy sources. Dr. Indyk (c) talks about the sod market with an SIA delegate. At right is William A. Closter, Kynbrook, N. Y.

SPRINKLER IRRIGATION

(from page 42)

charts he ably demonstrated the explosive power of water and air. Most SIA members realized that air in a line has detrimental effects. But Ball showed conclusively that entrapped air has the ability to rupture steel pipe and crumble two foot thick concrete.

His advice: 1. Make good installations, guard against flotation; 2. Fill pipes and tubing slowly; 3. Release air slowly; 4. Use air release valves that close slowly; 5. Design pipe to withstand high pressures—if all else fails.

Donald A. Clemans, superintendent, Olive Glenn Golf Club, Cody, Wyo. headed the speaker's list on the second day of the conference. His topic, "Water — Good or Bad" drew a good deal of interest in light of the energy situation as reported the previous day.

Here are some of the points he made: Water expands when cooled. It creates erosion problems. An excess of water helps make organic matter (peat bogs). Drainage and air movement in soil is more important than water during periods of drought.

Clemans said that he has observed that in turfgrass care during the past 50 years a number of changes have taken place. We've shortened the height of cut. We've started irrigating, not just greens, but tees, fairways and almost everywhere else that will help turfgrass or orna-

mentals. We've allowed golf cars to be driven down fairways during wet or dry conditions. We've doubled the number of golfers. And we've become product oriented.

The superintendent remarked that too much water can have as great an effect on turf as too little. His slides showing flooded fairways and greens adequately proved his point. However, he also said that as a turfgrass manager, the superintendent must become more water conscious. "We've all heard of maintenance budgets, quality improvement budgets," he said, "but have we heard of water budgets."

Under a discussion of "Pumps For Irrigation," Robert M. Wilkin, Wilkin Irrigation and Supply Co., Irving, Tex., said that proper engineering is probably the most important factor in the success and efficiency of a complete irrigation system. "Let's all get honest," he said. "If necessary, increase our costs enough to use proper engineering, and let's educate our clients to look for proper engineering . . . Few people will make a poor choice if they understand the alternatives. In the long run, poor engineering and designs do not save money. They just divide the expense between initial costs and subsequent repair bills after installation."

The meeting took a twist in a different direction with the next speaker. Dr. Gerald L. Smith, landscape architecture and environmental planning department, Utah State University, told the delegates that by the year 2000 more than 80

percent of our population will live in urban areas. This calls for open space planning, he said. By that he meant areas dealing with wild plants currently administered by the Forest Service, USDA, etc., and lands occupying pockets, corridors and elsewhere which have been abandoned or bypassed by populations.

The current energy shortage will restrict usage of our National Parks, he predicted. However, more people will be spending time in park areas closer to home.

"Urban open spaces cannot be thought of as a single use," he said. They must become integrated into the rest of life style; they must be adaptable to a multitude of uses. He said that acquisition of open space must relate to where people are located. For example, no strictly urban person will use open space located miles from shopping centers, churches and other places normally visited.

He concluded that the potential for open space planning around major cities is good. He cited a study of the 10 largest cities which showed that 20 percent of the land has not yet been developed.


Dr. Henry Indyk, extension specialist in turfgrass management, Rutgers University, discussed the use of sprinkler irrigation on sod farms. This has been of interest to a growing number of sprinkler irrigation equipment manufacturers. Pointing out that the sod producer is generally located close to the market, Indyk said that irrigation and sod production have engaged in a romance which has definite signs of long life.

"The sod producer judges his product (sod) by the appearance and development of the rhizome and root system," he said. "Use of irrigation minimizes the time from seeding to maturity."


He said that water reduces the chances of fertilizer burn on sod; and, it can be used to carry fertilizer to the growing plants. Many sod producers use water before harvesting. And water after installation of sod is necessary to the success of a job, he remarked.

"I'm optimistic about the future of the sod industry," he mused. "Turf plays an important role in the environment."

One further point. Dr. Indyk said that the sod farm offers a site for disposal of waste water to communities contemplating spray irrigation of effluent. In addition, sod farms can be used in the open space planning and preservation of open land. □



Pennfine ...



Other
fine-leaved
ryegrass

These two fine-leaved perennial ryegrasses were cut with the same mower. The one on the right shows the fibrous "paint brush" top which is characteristic of ryegrasses. Pennfine, on the left, took a smooth, even cut because it was bred for softer, easier to cut fibers.

Pennfine: the clean-cut perennial ryegrass.

All the new fine-leaved perennial ryegrasses are beautiful. Until the mower comes along. That's the moment of truth for ryegrass. And Pennfine is the fine-leaved perennial ryegrass bred specifically for mowability. You can see the clean-cut look of Pennfine in the photo above. You'll see it in your turf, too.

Pennfine vs. other fine-leaved ryegrasses

Developed and released by Pennsylvania State University, Pennfine is the best of the fine-leaved perennial ryegrasses. That's

the finding of the trials at University Park, Pennsylvania. Among nine cultivars, Pennfine ranked first in texture, first in density, first in decumbency (low growth), first in tolerance to snowmold and leaf spot. And, of course, first in mowability.

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The remarkable mowability of Pennfine — the result of breeding specifically for soft fibers — is demonstrated in the above photograph. It was also proven by the University Park trials. Over a five-year period, Pennfine

averaged 8.3 (of a possible 10) in mowability. The next best score was 7.3, and the other cultivars rated considerably lower.

With the finest blade of all the fine-leaved ryegrasses tested, Pennfine is beautiful to begin with. And, because of superior mowability, it stays beautiful. It's also highly compatible with Kentucky Bluegrass, both in terms of appearance and management requirements. If you'd like more information on this clean-cut perennial ryegrass, just send in the coupon.



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The on-off the track vehicle applies about 25 to 30 gallons per acre. In addition to being more economical than spray trains, they are more efficient and result in fewer claim damages.

TARGET: RR WEEDS

(from page 37)

to the contractors and suppliers. We then went to the regions and began surveying every mile of track to determine the amount of brush acres, species of brush present, and the areas of greatest danger.

By using a form to record the information needed, we set a priority on the lines that needed chemical application first, and the sections of the right-of-way that needed treatment. Physical requirements, such as distance of communication lines from the track were also recorded. Sometimes there are certain equipment requirements. Normally 50 to 60 feet can be reached effectively by on-off track vehicles. Greater distances may require a spray train. Another factor to consider is the time of application. Both early sum-

mer and late fall are good times to spray. In heavy agricultural crop areas where drift may be of unusual concern, perhaps it would be wise to spray in early fall.

This information can be discussed with regional personnel and then assigned priorities for lines to be treated. The information can then be carried to the railroad vegetation manager, who then can assemble the program. He has the information needed to figure the cost of treatment for each line and how much chemical is needed for each line. He can be assured that his decisions are based on facts or actual conditions as felt to be required by the regional managers.

Perhaps not all lines surveyed will be treated, but whoever is in charge of vegetation control for the railroad can be assured that the

lines treated are in need and that the dollars spent are spent wisely due to programming and planning.

EXECUTION

Now the execution phase begins. The contract is let and work begins. The railroad field personnel and the applicator should be provided with a printed program detailing the amount of solution to be applied in a given area and which locations are to be treated. The application should be properly recorded. These records not only verify the work done, but give the necessary records for future evaluations.

EVALUATION

The only way to discern whether the railroad has got its money's worth is to evaluate the application. The evaluation phase can begin by evaluating coverage 4 to 6 weeks after application. The evaluations should be continued into the *second and third years* after treatment so that the applicator and the railroad vegetation control manager know the longevity of control.

Surveying the lines and evaluating are two of the main services a contractor performs for the railroads. The contractor also should be a resource for technical knowledge needed. What label clearance does the product have? Can another product do the same job? Can the product be used safely around water? How long does the product affect the soil? Should any claim for damage arise, is there enough research information to defend the use of the product in a court of law? Can the use of the product be justified in relation to the results obtained versus the potential problems in use? Should the product drift from the target area, what damages can be expected?

A contractor needs to be thoroughly qualified. By "thoroughly qualified," I mean he should know the Federal and state laws which regulate the use of herbicides. The state laws vary from state to state. Knowing these laws can eliminate mistakes which not only cost money but bring about unwanted publicity.

He should know the herbicides available for use, their efficacy, the degree of safety offered, the extent of their economic advantages and what effects can they have on the environment with their continued use year after year.

He should help the railroad set policy as to types of application, timing, and help determine results obtained as to weed control as well as their safe and proper use. □



Milkweeds along the rights-of-way are controlled with 2,4-D or 2,4,5-T in combination with MSMA. Although the new trend is to combine the D's and T's with a herbicide which gives season-long control of many perennial weeds.



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Ditch Witch makes vibratory plow modules for all its Modular-matic vehicles. Or, there's the versatile 25-HP VP12, a self-contained vibra-

tory plow package.

If your job calls for main distribution lines, the same Modular-matic vehicle can handle that job, too — just replace the vibratory plow module with a digging module and you're ready to go.

Or, switch from trenching to plowing and back again instantly with a Ditch Witch Combo module, a vibratory plow and offset trenching assembly.

And you can outfit your basic vehicle for other jobs, too. Ditch Witch offers a versatile utility backhoe, a hydraulic boring unit and other money-saving attachments.

When your job calls for underground installation, and it's important to keep turf damage to a minimum, look to Ditch Witch — the leader in the underground equipment field.



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NEMATODE CONTROL

(from page 18)

the same time with a Noer soil profile sampler.

The populations of Ring and Spiral nematodes were reduced following each nematicide application. Nematode populations in areas receiving only one application began to increase within six to eight weeks after treatment. In the areas receiving the two applications (early and late), the nematode populations increased slightly following the early application and remained at a low level for the balance of the season.

The populations in the non-treated areas were rated as very moderate during April, increased to heavy in June, July, and August, and increased to very heavy in September.

Roots in all the nematicide-treated areas penetrated 158 to 175 mm (6.2 to 6.9 inches) which was nearly twice the depth of those in non-treatments. Plots receiving the early and late applications produced approximately four times more grass clippings than the non-treated area, twice as much as the late treatment, and three times as much as the early application. The increased grass clippings indicate a more vigorous plant

growth, even though this difference was not noticeable from general observation.

It is not difficult for the golf course superintendent to appreciate that the deeper root systems provide a greater ability for the plants to withstand stress periods and recover much quicker under the heavy traffic we have in Oklahoma.

Dasanit 15G has performed well for us, and our superintendents have selected the granular nematicide over the liquid fumigant because it's easier to handle. Many of the superintendents carrying out a nematode program say their greens are improved, yet they fail to understand how a little worm they cannot see could do so much damage. We suggest to our superintendents that if they are following a good maintenance program and are having difficulty maintaining a dense stand of grass, they should pull soil samples and obtain a laboratory nematode and fertility analysis.

Our nematicide trials have shown that applications of soil fumigants Nemagon or Fumazone, or the non-fumigant Dasanit will reduce populations of nematodes to a level that will aid growth of bentgrasses. Using the manufacturers' recommended

rate, Nemagon 12.1EC or Fumazone 70E should be applied as a drench, at the rate of one pint with 15 to 20 gallons of water per 1000 sq. ft. **Immediately** following this, the treated area should be given a good irrigation.

When using Dasanit 15G at 1½ to 3 lbs. formulation per 1000 sq. ft., distribute the granular dosage evenly over the turf area. Drench the grass thoroughly after treatment by applying approximately one-half inch of water. Do not treat newly-seeded areas!

Remember that while these materials will reduce the population of nematodes, they do not completely eradicate them from the soil. Therefore, it would be advisable to have your greens checked annually, once nematodes have been found to be a problem. □

Outstanding Dealer Award Presented To Porter Bros.

Porter Brothers was founded in 1949 and has 96 employees. Other principals include Joseph Porter, vice president and secretary-treasurer; James Porter, vice president; and Bob Hamrick, manager of the turf division.

Announcing the new Asplundh "Whisper Chipper" Looks the same — sounds so different!

This new unit has all the dependable features of our famous chipper line. However, there is a remarkable difference — a great reduction in noise. Modification kits will be available for many existing models. **Asplundh Chipper Company, a division of Asplundh Tree Expert Co., 50 E. Hamilton Street, Chalfont, Pa. 18914**

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