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In a letter accompanying the report, Dietz said, "After careful review of this information, I believe you will be able to make an informed decision about this issue of impact on 2,4-D."

Dietz has appealed to green industry members to speak up on the benefits and safety of 2,4-D before "unwarranted and precipitous actions prevail, circumventing a just conclusion," he said.

"If we do not make ourselves heard at the state or provincial and federal levels of government, those who regulate our industry will have little

choice but to act according to input from those who have," Dietz said. "We can sit back and let our future be dictated by others, or we can make the voice of the 'silent majority' be heard."

CHEMICALS

Diazinon still in use after ban appealed

The insecticide diazinon will be available for use on golf courses and sod farms at least until this summer.

The product's status is on "hold" because of appeals by the chemical's manufacturers to the EPA. Hearings are not expected until late summer or fall, according to information from Ciba-Geigy.

"As the nation's largest supplier of diazinon, we're taking the lead to defend the product," says Dick Feulner, Ciba-Geigy director of regulatory affairs. "We have years of research data on the safe use of diazinon."

There had been some confusion concerning the status of the chemical. In an effort to inform the public of diazinon's status, Ciba-Geigy held a press conference January 31, during the Golf Course Superintendents Association of America conference in Phoenix, Ariz.

At the press conference, Ciba-Geigy officials said they conducted a biolife investigation and found that four of the 40 birdkills were the result of deliberate misapplication. Twenty-two were intentional misapplication, one was not the result of diazinon use, and just two were apparent proper applications. Circumstances were unknown in the remaining 11 instances.

The EPA proposed cancellation of diazinon in December, 1986, after receiving reports of bird kills allegedly resulting from exposure to the chemical. The company maintains that diazinon is safe when applied properly. Ciba-Geigy intends to present research at upcoming EPA hearings verifying the product's safety.

Nonetheless, the company has adjusted its labeling rates to four pounds of active ingredient per acre, down from six. The company maintains that the effectiveness will only drop off slightly as a result of the change.

RESEARCH

Fungicide combinations effective in control

A more effective control of some turf diseases can be accomplished using certain fungicides in combination. This was the recommendation made by Dr. Anna Marie Pennucci at the GCSAA Show in Phoenix, Ariz., in January.

In a talk concerning tank-mixing, she suggested that by mixing the fungicides, rates could be reduced, adding that alternating fungicides produced the best results.

Pennucci, a professor at Southern Illinois University, Carbondale, conducted her research in the Northeast, and, she added, her research applies only to cool season climates.

continued on page 27



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Four heavy-duty diesel models are available with 49 to 63 SAE net horsepower. Tractor-loaders offer up to 4,500 lbs of lift capacity, with single-lever loader control and return-to-dig.

Choose from three power-matched transmissions—4 speed torque converter, dual range 8-speed, or manual-reversing 6x4.

Ask your dealer about the Ford Extended Service Plan. ESP covers many specific repairs for 36 months or 2,500 operating hours, whichever comes first. At a modest cost, it's smart protection for your rig.



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Hardworking Ford 1000 Series diesel tractors are ideal for a wide range of mowing, loading and site preparation jobs.

Choose from six models, 13 to 32 engine horsepower. Standard equipment includes important features like 540 rpm PTO, Category I 3-point hitch, full-time live hydraulics and a 10 or 12-speed transmission.

Options include front-wheel drive. Hydrostatic or Synchronized Manual Shuttle transmission, depending on model. Creeper speeds. And turf tires. Over 50 matching attachments and implements are available, including 15 different mowers.



Tractor-loaders

You can equip virtually every Ford tractor with a matching Ford loader. These quality loaders combine strength with smooth control. Double-acting lift and dump cylinders are standard. Lift capacities range from 530 to 5,000 pounds. All loaders offer a choice of buckets.

Quik-Tach loader models for many tractors make for great flexibility. You can easily mount or remove the loader to suit the work at hand.

Ford also offers many other attachments for grounds maintenance work: rotary cutters, flail mowers, front and rear blades, landscape rakes, scoops and posthole diggers.

A nearby Ford Tractor dealer is your one-stop source for equipment, parts and service



Industrial backhoes

With a Ford industrial backhoe-loader, you'll be well equipped for trenching, drainpipe installation and other heavy-duty earthmoving jobs.

With Ford you can count on awesome power and precise control. The 14-foot backhoe gives you 9,735 pounds of digging force, and the 12-foot model 8,800 pounds.

Two or four-lever controls offer precise operation. Ten-foot stabilizer spread provides a wide stance. A selection of buckets lets you equip your backhoe for a variety of digging jobs.



New mid-range tractors

The new Ford II models are versatile tractors that make short work of big-area mowing, loading, site preparation and other tough jobs. They're easy to operate and offer excellent all-around performance.

Choose from five diesel models from 34 to 60 maximum net engine horsepower. Standard equipment includes 3-point hitch, independent PTO, and power-assist steering. A new optional cab on selected models makes them an excellent choice for snow removal work.

Other options include front-wheel drive, synchromesh transmission, and turf tires.

Ford also offers 40 and 60 maximum SAE net horsepower low-center-of-gravity Ford II tractors.



Skid-steer loaders

You can cut your costs and increase productivity with New Holland Super Boom loaders. High-capacity hydraulics handle a variety of attachments including tree spades, backhoes, pallet forks, landscape buckets, trenchers and posthole diggers.

Eight models available with operating loads from 600 to 2,050 pounds.

To find out how much better a skid-steer loader can be, see your New Holland dealer.

Your Ford Tractor dealer is listed in the Yellow Pages under "Contractors' Equipment & Supplies" and/or "Tractor Dealers."



IT'S HELL ON ORDINARY TRIMMERS.

"We went through a trimmer every six months!" complained Doug Cole of Commercial Lawn, Inc., in Colonial Heights, Virginia.

Even though his crew used the best units from one of the leading lines, a nearby 110-acre cemetery kept knocking them dead.

"The trimmers have to run at full power for the greater part of the day. That's most of the problem. Every six months we could count on a visit to our local power equipment dealer."

Then, they changed trimmers.

SHINDAIWA BEAT THE GRIM REAPER.

"Our dealer in town talked us into field-testing a Shindaiwa C-35. On the basis of that trial we bought eight trimmers. We've never had to replace one. It's going on five years."

Over pretzels and a cold Bud, Doug and his crew would probably tell you a heck of a lot more.

Like how much more quiet our trimmers are. How light and easy they are to work with. And he'd swear by their easy maintenance features like electronic ignition and easy-on, easy-off diaphragm carbs.

ONE PULL WINS YOU OVER.

If you're having trouble with your trimmers, field-test a Shindaiwa. You'll likely become a believer from the first

pull. Even fresh out of the crate, it starts the first time.

But one pass through a tough stand of Devil's Weed will convince anyone. Our B-45, for example, churns out almost two and a half horsepower from 41.5cc. The T-20 over one horsepower from just 20cc. And the easy power breeds confidence in experienced hands.



WE REST OUR CASE.

Doug's story is no isolated testimonial. We hear the same thing from highway crews, from campus maintenance departments, from farms, stables, and golf courses.

So see for yourself. Field-test one on your own. Before you wind up mourning over an ordinary trimmer.



shindaiwa[®]
WE SIMPLY MAKE THEM BETTER.

Fungicide Combinations for Control of Dollar Spot

Combination	Ounces/ Square Feet	Percent of Disease in Turf After Treatment
Tersan 1991 + Chipco 26019	2 + 2	0-2
+ Daconil	2 + 4	0-0
+ Dyrene	2 + 4	0-2
+ Vorlan	2 + 2	0-0
Bayleton + Chipco 26019	1/2 + 2	trace-1.5
+ Daconil	1/2 + 4	0-1
+ Dyrene	1/2 + 4	0-1
+ Vorlan	1/2 + 2	0-0
Rubigan + Chipco 26019	1/2 + 2	0-2
+ Daconil	1/2 + 4	0-trace
+ Dyrene	1/2 + 4	1.5-3
+ Vorlan	1/2 + 2	0-0
Banner + Chipco 26019	1/2 + 2	0-1/2
+ Daconil	1/2 + 4	0-trace
+ Dyrene	1/2 + 4	0-1/2
+ Vorlan	1/2 + 2	0-0

Fungicide Combinations for Control of Brown Patch

Tersan + Chipco 26019	0-2
+ Daconil/Dyrene	0-1
+ Vorlan	0-1
Banner + 26019	0-1.5
+ Daconil/Dyrene	0-3
+ Vorlan	0-2
Rubigan + Chipco 26019	0-1
+ Daconil/Dyrene	0-1
+ Vorlan	0-2

FUNGICIDE from page 22

"There are things to consider when mixing more than one at a time," she said. Considerations include compatibility, phytotoxicity and clumping in the tank. But, she said, "For cool season climates, the best control is by tank mixing."

She pointed out a number of benefits from using two fungicides at once. They result in better control, longer residual (21-60 days), less chance of resistance, and the ability to eliminate more than one disease.

Using tank mixes, she said, is good for controlling diseases with short intervals between spore generations, and those with persistent, long-lived mycelium, such as dollar spot.

Pennucci's studies show that Vorlan in combination with either Tersan, Bayleton, Rubigan or Banner, gave the best control (see chart). Other combinations provided adequate control.

She noted, however, that there seemed to be no combination that would provide total control of brown patch. "There was no constant control of brown patch in 1986," she said.

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GRUB CONTROL

New approach taken in controlling grubs

Dr. Daniel A. Potter, an entomologist at the University of Kentucky, has been studying the one-year life cycle and living habits of grubs in hopes of using biological rather than chemical control on the pests.

He has found that grub eggs absorb water, requiring a minimum of 10 to 11 percent soil moisture to grow. "I was interested in how zero moisture

would affect these eggs," Potter comments. During a drought-stressed period in 1983, soil moisture content dropped to eight to 10 percent, with soil temperatures in the top inch reaching 109 degrees Fahrenheit. "We found no egg survival in non-irrigated drought-stressed areas," Potter comments. In irrigated areas with moisture at 21 to 24 percent, egg survival rate is 75 percent, he adds.

Also, in naturally drought-stressed turf, survival rate for newly-hatched grubs was just 1.7 percent; it was 70 percent in irrigated turf.

Unfortunately, the turf's tolerance to grub damage lowers if it is not irrigated, able to handle only eight to 10 grubs per sq. ft. before showing signs of injury. The irrigated turf can handle 15 to 20 grubs per sq. ft.

"There is a direct inverse relationship between the problems people are having with white grubs and the amount of rainfall occurring in the late summer and early fall," Potter says. Potter has also studied other means of control.

"Females are extremely attractive to males," Potter comments. "They're really turned on by the smell that appears to be coming from the female beetle." By putting females in a trap, Potter says, he caught "lots and lots of beetles." He has also rinsed the females with a solution, which has also been used to catch the males.

Potter believes his research will carry a number of benefits. "The most interesting prospect is perhaps in risk assessment," he says. "If a cheap knock-down cardboard trap can be made for about a dollar, this could be used by homeowners, by lawn care applicators, by golf course superintendents to hang out for the purposes of risk assessment. If you don't catch any beetles, you don't have to spray."

Potter spoke on the subject at the Virginia Turfgrass Conference.

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INDUSTRY

Deere thrusts 12 products on market

With a campaign that started two months ago, John Deere has energetically entered the professional turf market, introducing 12 new products designed specifically for the market.

"We want our sales force to have a good package of products so they can develop a relationship with the golf course superintendent," says Gary Gottschalk, Deere's manager of golf and turf products. "The 12 categories we have will be enhanced. We'll introduce another dozen this year yet; we hope to have 45 to 50 new products for the turf market by five years from now."

The products introduced at the beginning of the year are a walk-behind greens mower, four hydraulic reel mowers, a utility vehicle, a boom mower and five aerifiers.

"Because we have such a wide range of equipment, we're able to get into manufacturing specialty equipment for the golf and turf market," Gottschalk says. "It's a natural extension of the technology and components already in our system."

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You'll quickly notice Mustang's finer texture, rich dark green color and dense, uniform turf—and you'll understand why we say Mustang has bluegrass-like qualities.

But there's more to Mustang turf-type tall fescue than beauty; it's tough and durable. It's heat and drought tolerance, winter hardiness, and ability to endure low mowing heights are remarkable. Mustang even shows improved resistance to *Helminthosporium* netblotch and many other diseases.

Best of all, Mustang is practical, because it performs extremely well under low maintenance conditions like minimum fertilization, watering and mowing. National tests and actual applications in parks, golf courses and playing fields have proven it.



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In this 1953 National Geographic photo, Fred Grau (left) pulls on a piece of sod, a combination of Meyer zoysia and Merion bluegrass, with Sam Mathews, who wrote the NG article. Grau's assistant Al Radko golfs in the background. The "combination" sod was called the answer to a golfer's dream.

A RARE BREED

If it weren't for turf research, golf course and landscape management wouldn't be as sophisticated as it is. Part three of WEEDS TREES & TURF's 25th anniversary series looks at developments in golf, seed and irrigation.

by Heide Aungst, associate editor

As far as speeches go, it had no impact on history. It didn't begin with King's eternal words "I had a dream..." Nor did it contain a particularly memorable phrase like Kennedy's "Ask not what you can do for your country..." Or revolve around an unforgettable character such as Nixon's dog Checkers.

But a speech that noted turfgrass authority Dr. Fred Grau made in 1965 did reflect on the industry in its infancy and forecast changes which have since come about.

It began: "The past is prologue. That is to say, everything we have done so far is only a beginning. There is no merit in reviewing the past unless, in so doing, we shape our course for the future. It is with this in mind that we dip back into significant chapters of turfgrass development and then leap ahead into the unknown, guided by the light of our burning mistakes..."

In that speech more than two decades ago, Grau predicted:

● "Labor will be half of the budget instead of $\frac{2}{3}$ to $\frac{3}{4}$ it is now." (The



As golf courses moved inland away from humid seashores, improved turf varieties and irrigation systems helped maintain the manicured look.

average rate is just approaching half).

● Putting green mowers, if we are still using grass, will cut four feet at a swipe and a man will guide it electronically. (WT&T just reported on the first artificial greens in use; greens mowers can cut that wide; and Kubota just come out with an electronically guided mower.)

● Plant nutrients on fertilizer bags will be expressed in elemental form. (There's a recent movement among researchers to recommend this.)

● The grasses of the future will be disease-free versions of the best we have today. They will be bred for extreme resistance to drought, pests and wear.

● Sprinkler systems will be completely automated and designed to supply water as needed in minimal quantities.

● The superintendent or turfgrass manager will be a part of management on par with the pro and the club manager.

The last three predictions say it all. Although researchers continue to