

From Tee-2-Green

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A portfolio of creeping bentgrasses perfect for your plans... from the world's foremost marketer

Scientific name:	Growth habit:	Shade tolerance:	Heat tolerance:	Cold tolerance:	Traffic and wear tolerance:	Seeding rate, greens:	Seeding rate, fairways:
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AS WE SEE IT

TERRY McIVER, MANAGING EDITOR



2,4-D's stamina proves that truth is stronger than fiction

The scientists who concocted 2,4-D 46 years ago deserve a debt of gratitude that extends well beyond their scientific achievement.

Thanks to them, thousands of others have found a cause, have "gotten a life," so to speak: to ban the production and use of the most well-known, highly-praised, bitterly-reviled and hotly-disputed herbicide.

Many of these crusaders are themselves scientists, who might like nothing better than to say they helped ban this solitary product. That would be a grand achievement, because—like health care "reform"—we don't need to do it, but it would be big news if it ever happened.

If 2,4-D were a living patient, it would have croaked years ago from the rigors of the exam. It's opened wide and said "ahh" more times than a room full of measles-infested kids.

"There are 94 epidemiological studies we're aware of that are pertinent to 2,4-D," says Don Page, executive director of the 2,4-D Task Force, an interest group composed of agricultural control product manufacturers, "and you can add to that the probable 4,000 toxicological studies that have been done on 2,4-D."

The Journal of the American College of Toxicology reported that more than 40,000 scientific articles and technical reports addressing 2,4-D had been published by 1978.

Most recently, an April 1994 report by an EPA panel determined that existing 2,4-D studies showed no demonstrable link between 2,4-D and cancer in farmers who used it, or in animals.

The panel said it was impossible to determine whether the studies were detecting a risk that was related to the herbicide or to some other aspect of farming as an occupation.

The risk from using 2,4-D, said the study, "did not seem to be much higher than the risk of farming as a general work exposure."

There is also new doubt about the

accuracy of some prior surveys.

According to Page, the National Cancer Institute (NCI) has received \$25 million over the years to finance studies of 2,4-D, in laboratories or through surveys of end-users or end-user family members.

Those statements by family members—called proxy statements—have recently cast a shadow of doubt over the validity of 2,4-D surveys.

Page says a review of data by the U.S. Centers for Disease Control and Prevention showed that—in the NCI studies done in Kansas, Iowa and Minnesota in the 1980s—there was less than 50 percent agreement between cancer-case users and the family members who spoke on their behalf.

"And the self-respondents in the Nebraska study show no association between product use and lymphoma; the next-of-kin respondents do," adds Page.

In other words, the farmers who used the products were the only ones who should have been surveyed, since they would be best able to recall how they used the product and how often.

The Task Force has completed 85 percent of the tests required to reregister 2,4-D, and by the time it's done, it will have spent \$28 million.

But it won't end there. Report that there's no link between a product and disease, and you prompt a halcyon cry for more money and more study.

There are 1100 chemical compounds up for reregistration, but Page says fewer than 450 of those will last, due to the more than \$3 billion it would cost the manufacturers.

Why conduct all this research if you continually question the results?

These scientists must all be guys: They just can't commit.

LANDSCAPE MANAGEMENT

"WE KNOW YOUR TURF"

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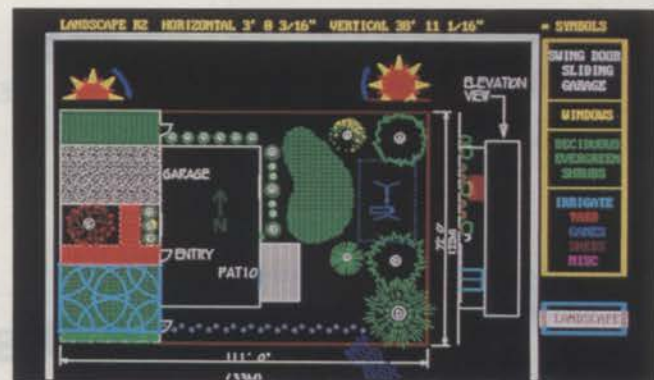
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S1-S40 In this special supplement to Landscape Management magazine this month, you will find valuable information that will make your job of selecting the right seed easier throughout the year. From bahiagrass to zoysia, "we know your turf."

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On the cover: Residential irrigation photo courtesy of Toro Irrigation, Inc.

LM READER ADVISORY PANEL

Joe Alonzi
Westchester Country Club
Rye, N.Y.

Rod Bailey
Evergreen Services
Bellevue, Wash.

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Mahoney Golf Course
Lincoln, Neb.

Charlie Racusin
Environmental Landscape Services
Houston, Tex.

Jack Robertson
Robertson Lawn Care
Springfield, Ill.

Steve Wightman
Jack Murphy Stadium
San Diego, Calif.

LANDSCAPE MANAGEMENT

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EDITORIAL STAFF—Fax: (216) 891-2675
JERRY ROCHE, Editor-in-Chief: (216) 826-2830
TERRY McIVER, Managing Editor: (216) 891-2709
RON HALL, Senior Editor: (216) 891-2636
MICHELLE THERRIEN, Graphic Designer: (216) 891-3101
MAUREEN HREHOCIK, Group Editor: (216) 826-2829

BUSINESS STAFF—Fax: (216) 891-2675
JON MIDUCKI, Publisher: (216) 826-2855
RAY LENDER, Group Publisher: (908) 549-3139
ROBERT EARLEY, Group Vice President: (216) 826-2816
JUDY PAWLOWICZ, Production Manager: (218) 723-9281
ROSY BRADLEY, Senior Production Mgr.: (218) 723-9352
DEBI HARMER, Production Director: (218) 723-9325
DIANE BIAS, Administrative Coordinator: (216) 891-2750

ADVERTISING OFFICES

CLEVELAND (HEADQUARTERS) OFFICE

7500 Old Oak Blvd.
Cleveland, OH 44130
Phone: (216) 243-8100
Fax: (216) 891-2675

JON MIDUCKI, Publisher: (216) 826-2855
ROBERT OHLSEN, National Sales Manager:
(216) 891-2682

ANNE LANGHENRY, Promotion/Research Mgr.:
(216) 891-2739

DIANE BIAS, Administrative Coordinator:
(216) 891-2750

SEATTLE OFFICE

1333 N.W. Norcross
Seattle, WA 98177
Phone: (206) 367-5248
Fax: (206) 367-5367

BOB MIEROW, West Coast Representative

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ASK THE EXPERT

DR. BALAKRISHNA RAO



Galls on Scotch pines

Problem: We see galls on a client's Scotch pines. Two trees have many galls, while six more pines have just a few. Some of the galls have yellowy spores on them. Is this a rust gall? (Canada)

Solution: Based on the description of your field observations, the problem on pines appears to be related to pine gall-rust disease caused by *Endocronartium harknessii*. This disease is also known as western gall rust. It has been reported on two- and three-needled pines in Canada and the United States.

The rust fungus produces round or sometimes pear-shaped woody galls primarily on branches but also on stems. These galls enlarge year after year until the branches are girdled. This causes dieback of affected branches. Often, secondary fungi or canker-causing fungi can also affect these trees.

The fungus infects young branches on the stalk of female cones. From the cones, the fungus moves down the branches. During the year of infection, no symptoms appear; however, galls begin to swell the following year. They can enlarge to 1 to 10 centimeters in diameter. By the second or third year, galls may develop bark collars at one or both ends. Secondary fungi and insects can attack these galls and kill them. The galls break open annually and release yellowish-orange spores during pine-candle elongation, beginning two to four years after infection.

The galls produced by the pine gall-rust fungi *E. harknessii* would be difficult to distinguish from the globose galls also produced by pine-oak galls rust caused by *Cronartium quercuum*. Generally, if rust-galls on pines are seen in the absence of oaks (alternate host), the problem is attributed to pine gall-rust caused by *E. harknessii*. For further diagnosis, laboratory analysis of spore germination is necessary.

As far as managing the pine gall-rust problem on pines, consider treating once with fungicides, such as mancozeb, when yellow pustules of rust break through bark on galls. Selectively prune branches with rust-galls and discard them or preferably rogue them before May 1. Severely infected trees may be unstable and subject to windthrow. Therefore, proper care of infected plants is highly desirable.

Read and follow label specifications.

Managing Kudzu

Problem: What is the best way to manage Kudzu weeds growing around residential and parking lot properties? We have used Roundup with some luck. (North Carolina)

Solution: Kudzu (*Pueraria lobata*) is a difficult weed to manage. It presents a serious problem close to wooded areas. You could use Roundup as in the past to manage this. Label recommendations are to use four quarts/acre, if broadcast spraying, or a 2 percent solution, if using a backpack sprayer.

Roundup should be applied when the plants are actively growing. Repeated applications may be necessary. Roundup is a nonselective post-emergence herbicide, so be careful while applying it

around desirable plants. Even a small drift can injure desirable plants.

Arsenal, from American Cyanamid is a non-selective systemic pre- and post-emergence herbicide for grassy and broadleaf weeds. Generally, one application should be enough per season.

Pre-emergent activity should last three to four months when applied at a rate of 4 to 6 pints/acre. Because of its pre- and post-emergence activity, this would be your best choice to manage Kudzu. It gives good residual activity against a wide variety of annual, perennial grass and broadleaf weeds. Make sure the weeds are actively growing. For optimum control, Arsenal should be applied at a rate of 70 gallons of water per acre, according to a company spokesperson. Also, since it is a non-selective herbicide, avoid contact with desirable plants.

Arsenal is a slow-acting herbicide; therefore, the plant may not show chlorosis or necrosis of newest leaves for two to three weeks, and complete kill may not occur for several weeks. Do not apply in areas where potential for soil erosion exists, or herbicide may be washed off to non-target sites. In these situations, the roots of desirable plants may absorb this herbicide and may be injured.

Read and follow label specifications for better results.

Poison ivy control

Problem: What is the best way to control poison ivy? (New York)

Solution: Treatments with Amitrol (trade name: Amizole, Aminotriazol or Weedazol), a post-emergence herbicide, reportedly provide excellent control of poison ivy. It is a non-selective herbicide made to be applied on foliage of perennial broadleaf weeds such as poison ivy.

Avoid contacting desirable, non-target plants because it will turn the leaves yellow, white and then brown. Use Amitrol as a spot treatment for perennial weeds like poison ivy in or near nursery crops or landscaping. For best results, treat weeds at full leaf, about four to six inches high, and before blooming.

Check with your county extension agent for clearance to use this product in your area. All registrations for the use of Amitrol on food crops, including pastures, have been canceled. Avoid using in an area where there is a chance for food or feed contamination. A waiting period of six to eight weeks is required before planting any plant material.

Roundup is also registered for managing poison ivy plants. Apply four to five quarts of Roundup per acre as a broadcast spray or as a two percent solution with hand-held equipment.

Dr. Balakrishna Rao is Manager of Research and Technical Development for the Davey Tree Co., Kent, Ohio.

Mail questions to "Ask the Expert," LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. Please allow two to three months for an answer to appear in the magazine.

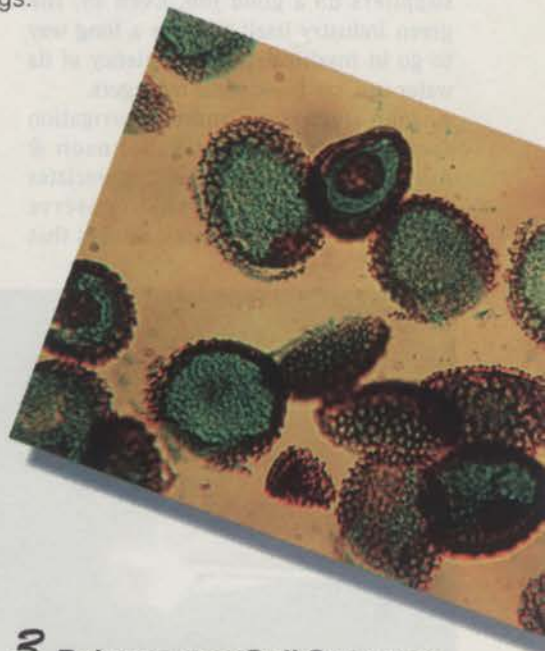
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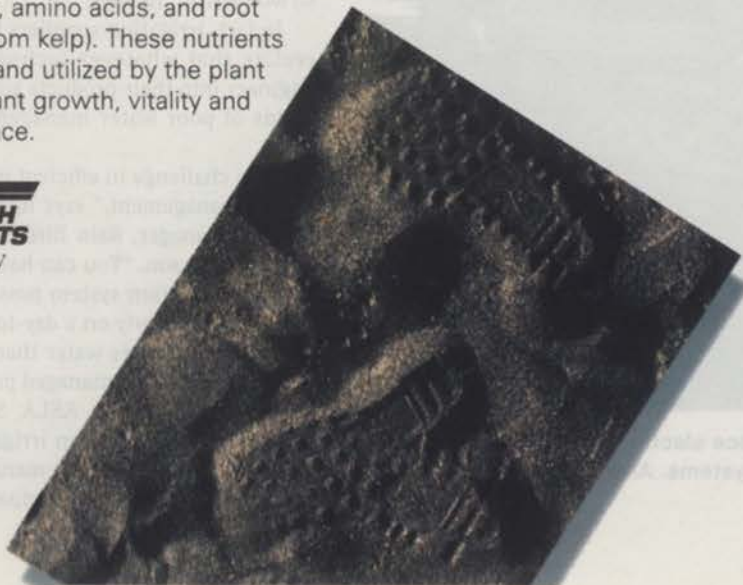
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IRRIGATION INNOVATIONS

■ Turfgrass and landscapes cannot survive without water. The continued availability of fresh water is an ever-growing challenge to the green industry—perhaps its greatest challenge. The charge to irrigation suppliers is to provide innovative products for ever-more-efficient turfgrass and landscape irrigation.

Turfgrass and landscape managers say suppliers do a good job. Even so, the green industry itself still has a long way to go in maximizing the efficiency of its water use, say these same managers.

John Gustavson, landscape irrigation specialist with Carole R. Johnson & Associates, Cambridge, Mass., appreciates irrigation innovations that conserve water: soil moisture sensors, devices that

Even with a profusion of efficient water-saving irrigation equipment on the market today, WHO—and not WHAT—makes the difference.

automatically detect broken underground irrigation pipes, drip emitters, and the newest generation of controllers.

"The water supply here in the east isn't as critical as, say, in Colorado, but it's getting critical as far as cost," says Gustavson. "I think the Northeast is backing into real conservation from a matter of cost as opposed to out-and-out lack of availability. The incorporation of some type of water conservation element is something I've been putting into a lot of my projects."

But products, no matter how innovative, function only as well as their operators allow them, and even Gustavson admits that "the potential to over-water is great." In the Northeast anyway, irrigation isn't normally critical to landscape plant or turfgrass survival. Typically, irrigation supplements natural rainfall during summer drought or drier-than-normal autumns.

"The tendency is—and this is most true in some corporate centers—'Hey, we've got it (irrigation). We're going to use it.' People sometimes like to turn on their system and watch it because it looks so wonderful," he says.

In fact, irrigation suppliers themselves realize that whatever technology they engineer into their products suffers at the hands of poor water management practices.

"The challenge in efficient irrigation is one of management," says Ron Wolfarth, product manager, Rain Bird Commercial Division, Tucson. "You can have the most efficient irrigation system possible, but if it's managed poorly on a day-to-day basis, you can waste more water than an inefficient system that is managed properly."

Richard A. Fisher, ASLA, San Diego, believes this gap between irrigation technology and proper system management is more prevalent in municipal systems



Golf course superintendents continue to replace electro-mechanical irrigation systems with computerized, central control systems. Also, look for more hand-held radios in the coming years.

than on golf courses. For one thing, a golf course superintendent's livelihood is tied to water management. Usually, the superintendent is intimately aware of the system. In city parks and boulevards, on the other hand, systems aren't inspected or managed as intensely.

"The labor force in the landscape maintenance industry has not improved to the magnitude that the equipment has," claims Fisher, who heads up the Landscape Architecture Division of BSI Consultants. "And—at least here in California with its struggling economy—it would probably be naive to believe it will change in the short term. The competitiveness in the bidding of landscape maintenance has become extreme.

"We're not seeing the operation of the equipment coming close to its potential," he adds.

Sometimes forces outside the industry drive it to more efficiency. Fisher feels that may be the case with California's Assembly Bill 325.

That legislation, initiated in 1991 and now being adopted, requires that California communities adopt water laws that:

- encourage groupings of plants

according to water needs (it does not prohibit or require specific species);

- encourage use of automatic irrigation systems with water conserving designs;

- focus on proper grading and drainage, as well as the using mulches, to promote healthy plant growth and prevent excessive erosion and runoff;

- promote the use of reclaimed water;

- recognize regional differences, including fire prevention needs;

- provide economic incentives to promote efficient use of water; and

- require routine irrigation system repair and adjustment, water audits and prescribing the amount of water applied per landscape acre.

"We find that the developer or the homeowner is putting a greater investment in their irrigation systems," says Fisher. "We see an overall better effort on the research of irrigation design. There's a more conscientious concern about what the soils report says, looking into evaporation coefficients, those types of factors rather than programming the system to apply an inch of water a week and leaving it at that."

"Technologically, we think the manufacturers have come a long way in providing us with advanced equipment, particularly with controllers. The timing capabilities of controllers can now be extremely flexible so that we can apply water to particular hydrozones efficiently."

Among the irrigation trends that Fisher sees:

- ✓ Increased use of reclaimed water. "In some of our park projects, even though reclaimed water is not available yet, the city is telling us to design the system so that it can be converted to reclaimed water when it becomes available," says Fisher. Although there are strict regulations about applying reclaimed water, its use will definitely grow.

- ✓ More drip systems. "There are challenges to both the installer and the maintenance personnel when you get into a drip system, but from a water conservation standpoint they work," says Fisher.

- ✓ More use of sensors that monitor soil moisture, shut off systems during rain, detect leaks and system failures.

—Ron Hall

WHAT'S NEW IN IRRIGATION

(MORE ON PAGE 10)

■ Some innovations in the irrigation equipment market look like something out of Buck Rogers of the 21st Century. Hey, after all, it is almost the 21st century.

Take Toro Irrigation's Greenkeeper controller, expandable with two-station modules.

"The controller would be able to expand even after it is installed," explains Tim Tousignant, Toro's residential/commercial marketing manager. "The benefit is the flexibility it gives the end user in terms of aftermarket installation without reinvesting in all new hardware."

This and other controller improvement, Tousignant says, give golf courses, municipalities, even homeowners "more sophisticated approaches" to their water management needs.

Scott Morgan, Toro's golf marketing manager, says golf course superintendents are continuing to replace electro-mechanical systems with computerized, central-control systems. Also, hand-held radio controls will be more common.

Curt Thompson, national sales manager for Buckner Irrigation, says "the high-tech advancements have come about because the cost of micro-circuitry and the hardware that the software drives has become affordable." Even so, adds Thompson, the system has to be designed for the irrigation guy and not the computer guy.

"We don't design ours to be hard to operate. If you can pick

your nose, you can run our system. It only takes one finger," he claims. His company offers systems that monitor pump activity and flow, automatically shut master valves off, and even electronically page the operator when there's a concern.

But not all irrigation product advances involve radios, electronics or controllers. Some are as basic as rotors and valves.

Ron Wolfarth, a product manager at Rain Bird, points to his company's Rain Curtain technology and its new sprinklers that provide excellent and more even close-in watering, efficient irrigation for the 1/4 area closest to the closed-case rotor itself.

The Rain Curtain technology, he says, produces an even "curtain" of water without heavy spots, and dispenses larger water droplets that resist wind drift.

Mike Saliwanchik, Senninger Irrigation Inc., Orlando, Fla., says the rising cost of energy (to operate a system's pumps) and the growing use of reclaimed water also spur irrigation product development and improvement.

A new Senninger product, the T-Spray, responds to those concerns and is directed toward nurseries and plant growers. Saliwanchik describes it as a device that runs a higher volume of irrigation water to the plants without the clogging problems of other micro-spray or sprinkler products.

Other neat stuff we found in product catalogs, in no particular order:



Solatrol: Light Energized Irrigation Technology (LEIT-Link). Universal control units that operate under ambient light, even in the heaviest shade. It looks like a parking meter but it's a lot handier.

Circle No. 251 on Reader Inquiry Card

King Technology: Waterproof safety connectors. Sparkproof, silicone-filled, twist-on. Splices solid and/or stranded wires. Meets NEC coded direct-bury standards.

Circle No. 252 on Reader Inquiry Card

Kifco: Water-Reel traveling irrigation machines. Portable, can irrigate a complete football field in a single pass. Relatively inexpensive but labor saving. Good back-up for in-ground systems.

Circle No. 253 on Reader Inquiry Card

Glen-Hilton Products: Freeze-Clik preset temperature sensor to keep sprinkler systems from operating during freezing or near-freezing temperatures. From the same folks who manufacture the Mini-Clik II rain sensor shut-off.

Circle No. 254 on Reader Inquiry Card

Salco Drip Irrigation: Drip emitters—single outlet, six outlet and bubbler. Flexible drip hose made of PVC. Full line of drip irrigation accessories.

Circle No. 255 on Reader Inquiry Card

Olson Irrigation Systems: Threaded sprinkler riser. Raise or lower a sprinkler with minimum digging. Pressure-Compensated Emitter. Patented silicone cylinder, self-cleaning pulsating action.

Circle No. 256 on Reader Inquiry Card

Aquapore Moisture Systems: Porous pipe. Handy in raised beds, perimeters, planters, median strips. Applies precise amounts of

water to plant root zones. Uniform distribution of water along length of pipe.

Circle No. 257 on Reader Inquiry Card

Greenlawn Sprinkler: Valves, valves and more valves. Also, heads and risers, manifold tees, and nozzles, including plant and shrubbery nozzles.

Circle No. 258 on Reader Inquiry Card

Murdock Water Sensor Equipment: Hydrants (post and flush-box). Drinking fountains. Emergency showers and eye wash equipment. Sturdy.

Circle No. 259 on Reader Inquiry Card

Smith Precision: Liquid fertilizer injectors. Seven models. Operate on water flow. No lubrication or adjustment required.

Circle No. 260 on Reader Inquiry Card

Remote Control Technology:

Hand-held remote controls. At the touch of a button, turn on any valve from up to 1/2 mile from the controller.

Circle No. 261 on Reader Inquiry Card



COVER STORY II

by Mark L. Dlugoss

A sure cure for equipment ills

■ The worst possible thing that can happen to a landscape manager is "downtime." The most common reason for downtime?—equipment breakdowns.

If any piece of equipment is neglected over a length of time, a problem is sure to become serious, such as a hose or belt breaking; even worse, an oil seal blowing out and leaking. Now a simple repair of \$5 to \$10 has escalated to \$300 to \$400. While expenses increase on the repair, money is also lost because of not being able to perform a contracted job. Time and productivity is also lost with idle workers, who, incidentally, are still being paid while a repair is made.

"Knowing all that, then, why don't landscapers maintain their equipment on regular basis?" asks Mike Goodwin, worldwide service manager, commercial division, the Toro Co., Bloomington, Minn. "The main reason is time. Everyone is in a hurry to get the job done,

Visual checklists are the most basic kind of preventive maintenance, according to experts.

to meet a schedule, and everything is secondary to that point."

But time—and money—can be saved in the long run by creating a preventive maintenance program, which also helps avoid expensive repair costs and downtime and to extend the life of the equipment.

Developing a program—Begin with the manufacturers. Each piece of equipment has recommended service intervals.

"Most manufacturers have a detailed suggested maintenance program that they provide with their equipment," declares Joseph O'Reilly, service advisor for Kubota Tractor Corp., Compton, Calif.

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