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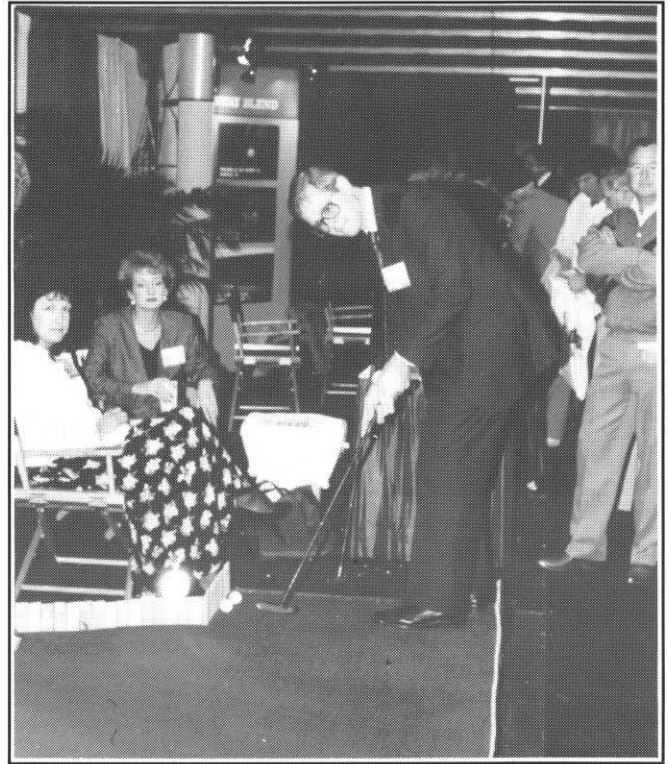
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Candid Camera at Orlando



Dennis Hendrickson, Wedgewood Valley GC, tests putting skill.

—Photos by Dale Wysocki



Kevin Clunis, Stillwater CC, right, with Steve Garske, Par-Aide.

St. Louis Superintendent Wins GCSAA Golf Competition

After a first-round 77 at Orlando's Hunters Creek GC, Roger Null, CGCS, came back with a 72 on The New Course at Grand Cypress to win the 1990 GCSAA Golf Championship.

For the first time in several years, the weather did not play a factor in the tournament.

Wind, rain and cold temperatures had wreaked havoc at recent GCSAA championships. Sunshine and 80-degree temperatures prevailed as Null captured his second championship in seven years.

In winning, the superintendent at Norwood Hills CC in St. Louis, Mo., took home the Bobby Jones Trophy and the USGA traveling trophy.

Null, comparing this victory to his first GCSAA Championship title seven years ago, said, "In 1983, I came in and just tried to play as good as I could, and it (winning) just happened. This second time really got hard. I had a bad first round, but got a great start on the second round. Grand Cypress really played to my style."

Only one stroke behind Null, with a gross score of 150, was Chuck Green, superintendent at Florence (S.C.) CC. However, Green's net score was good enough to nab the Championship Flight net division title.

The Carolinas GCSA #1 team earned the Scottish Trophy for winning the gross division of the chapter team competition. Members were Chuck Green, Dave Powell, Gary Bennett, CGCS, and Dyrck Fanning.

The Frank Lamphier Trophy, awarded to the winner of the net division of the chapter team competition went to the Connecticut GCSA #5. The Connecticut entry was made up of Ray Beaudry, CGCS, Ted Maddocks, Mike Reeb and Mike Wallace, CGCS.

Five hundred seventeen competitors teed it up for this year's championship, contested at five Orlando courses: the Palm, Magnolia and Lake Buena Vista courses at Walt Disney World, Hunters Creek GC and The New Course at Grand Cypress Resort.

Other individual flight winners were:
1st Flight (6-10 handicap)—Robert Prickett, gross; David J. Brown, net.

2nd Flight (11-15 handicap)—Anthony Grieco, gross; Noel Villarreal, net.

3rd Flight (16-20 handicap)—Britt Pollock, gross; Steve Van Acker, net.

4th Flight (21-25 handicap)—Stephen Wilson, gross; Alex Galaviz, net.

5th Flight (26 or higher handicap)—Mike Wallace, CGCS, gross; Jeff Broadbelt, net.



Sketches by this charming artist attracted considerable attention.

Senior I (ages 50-56)—Corey Eastwood, CGCS, gross; David Linde, net.

Senior II (ages 57-64)—Edward Embres, gross; John Spodnik, net.

Super Senior (ages 65 and up)—Paul Schurtz, gross; Ed Peters, net.

Affiliate—Bob Bullard, gross; Rick Summers, net.

The 1991 GCSAA Golf Championship will be held Feb. 4-5, in Scottsdale, Ariz.

Edina's Bill Johnson Places 5th in Senior I Competition at Orlando

Bill Johnson, Superintendent at Edina Country Club, has a new pewter plate to display.

Bill shot a 79-80—159 to capture fifth place in the 1990 Senior I golf competition during the 1990 GCSAA International Conference in Orlando, Fla.

He finished 10 strokes behind the winning low Senior I gross of 149 posted by Corey Eastwood, San Diego, Calif.

Minnesota's team, represented by Johnson; Jim Lindblad, Wayzata CC; Paul Mayes, Brackett's Crossing, and Mike Olson, Golden Valley, finished "in the middle of the pack" among the 75 teams entered.



More than 200 persons enjoyed "Minnesota Hospitality Night!"

Pesticide Fate in Turf

By Dr. Bruce E. Branham
Michigan State University
East Lansing, Michigan

PART II

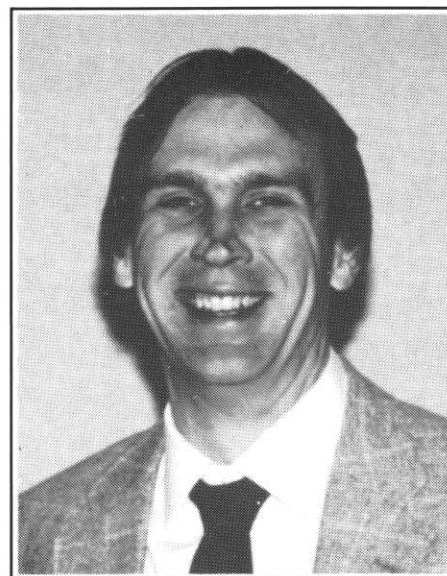
Leaching is probably the biggest environmental concern facing the turf industry. The three factors mentioned in the December-January issue—soil absorption, persistence in soil, and water solubility—play a large role in determining the leaching potential of pesticides. Paraquat is very water soluble and has a long half-life in soil, but, because it is absorbed so strongly, it has never been detected in ground water and does not leach.

Another important factor in pesticide fate is runoff. Runoff occurs when the precipitation rate exceeds the infiltration rate of the soil. This often occurs during intense rainstorms. This is a serious concern of row crop agriculture where many of the pesticides are applied to bare soil which is not held in place by plants. When runoff occurs from row crops, not only can a pesticide be carried in the runoff, but water-insoluble pesticides can be carried on soil particles. In turf a different situation exists because the continuous plant cover holds the soil in place, preventing any soil erosion. Research by T. L. Watschke et al. (2) at Penn State University has shown that a well-maintained turf does an excellent job of reducing runoff, and that a turf improves soil permeability over time, allowing for greater infiltration. Watschke's data has shown that runoff from turfed sites is relatively rare and confined to intense rainoff events. Runoff can be considered a minor means of pesticide transport from turf in most situations.

Another means of transportation is volatilization. Volatilization is the transfer of a pesticide from a solid or liquid

phase to a gas or vapor. The vapor can then be transported in the air and deposited off the application site. Volatilization is a concern when using broadleaf herbicides that are formulated as esters. Esters are generally volatile and can cause injury to non-target plants if volatilization occurs. The tendency for volatilization to occur depends primarily on the vapor pressure of the pesticide. Temperature and moisture also play important roles in determining the quantity of a pesticide that is volatilized.

Spray drift is technically not a pesticide fate process since it occurs before the pesticide is deposited on the soil or plant surface. However, spray drift is something that should be clearly understood since it is primarily determined by the spraying equipment used. Data in Table 2 shows the effects of droplet size on the length of time for the droplets to reach the ground. Droplets smaller than 100 μm in diameter are considered aerosols and tend to settle to the ground very slowly. Droplets of these sizes should be avoided. Droplet size is determined by nozzle orifice size, spray pressure, and



Dr. Bruce E. Branham

spray solution viscosity. The lawn care industry attempts to avoid spray drift by using the Chemlawn gun. This low-pressure sprayer has an average spray droplet size of 2200 μm , well above the aerosol size limits. These drops are much heavier and fall rapidly to the turf.

The above discussion has centered on transportation processes which can result in the movement of pesticides from the site of application to undesirable sites such as ground water, surface water or non-target plants. We will now discuss the transformation processes which are generally viewed as beneficial since the result is the alteration and/or degradation of the pesticide molecule.

Unlike traditional row crops, all turf pesticide applications are made directly onto plant foliage. The turfgrass com-

Table 2: Effect of spray droplet size on spray drift.

<u>Droplet Diameter</u>	<u>Time to Fall 10 Feet</u>	<u>Distance Traveled in 5 MPH Wind</u>
1 μm	28 hr.	29,050 ft.
10 μm	17 min.	7,480, ft.
50 μm	40 sec.	295 ft.
100 μm	11 sec.	77 ft.
400 μm	2 sec.	15 ft.
1000 μm	1 sec.	7 ft.

from Ross & Lembi "Applied Weed Science"

Pesticide Fate in Turf—

(Continued From Page 20)

munity intercepts all pesticide applications and absorbs a fraction of each application. Plant absorption is one mechanism of pesticide transformation since most plants attempt to transform pesticides into more water soluble compounds through biochemical reactions. The extent of plant absorption of various pesticides by turfgrasses has not been well studied, and thus the magnitude of this pathway of pesticide removal is not known.

Another means of pesticide degradation that is difficult to quantify is photodecomposition, which is the degradation of compounds by light energy. This is difficult to study under natural conditions because it is difficult to tell whether degradation is due to light, microorganisms, volatility or other factors. The dinitroaniline herbicides (e.g. benefin, trifluralin, pendimethalin, and prodiamine) are known to be susceptible to photodecomposition; however, once they are watered into the soil, they are assumed to be safe from photodecomposition.

Microbial degradation is the most common means of pesticide degradation. Microorganisms are extremely efficient at degrading a wide variety of organic compounds. Microorganisms degrade pesticides by two different processes. Microorganisms which can use a pesticide as a food source are said to metabolize the pesticide. This method of degradation leads to a fairly rapid disappearance of the pesticide. Some microorganisms will alter the structure of the pesticide but are unable to gain any energy from the reaction. This process is called cometabolism. A pesticide degraded by a cometabolic process would tend to persist in the soil for a longer period of time. Microorganisms are extremely diverse and capable of degrading a wide range of organic compounds. Degradation by microorganisms is desirable because it usually results in the detoxification of the pesticide.

This discussion has attempted to identify the major pathways by which pesticides are transported or transformed in the environment. The issue of pesticides in ground or surface water and public exposure to pesticides will continue to be a major concern for our industry. Understanding the issues and concerns of pesticide use can only benefit our industry.

- 1) R. Doll and R. Peto. 1981. *J. Natl. Cancer Inst.* 66, 1192.
- 2) Watschke, T. L., S. Harrison, and G. Hamilton. 1988. *Movement of nutrients and pesticides in runoff from turfed slopes. Agron. Absts.* 157.

Former Researcher Joins GCM As Technical Editor

David M. Bishop has joined *Golf Course Management* (GCM) magazine as technical editor according to Clay Loyd, publications director for the Golf Course Superintendents Association of America (GCSAA).

GCM, the monthly journal for golf course superintendents and turfgrass managers, is the association's official publication.

Bishop comes to GCSAA from UAP Special Products in Fremont, Neb., where he served since 1985 as technical services manager/agronomist. Previously he spent five years with the University of Nebraska extension service specializing in turfgrass integrated pest management.

"GCSAA will be able to further expand the technical editorial content of GCM for the benefit of its readers, especially member golf course superintendents, with the addition of this newly created full-time position," Loyd said. "David Bishop brings to the magazine the background, contacts, skills and talent to help in that effort."

Bishop holds a master's degree in horticulture, with a minor in entomology, from the University of Nebraska, Lincoln. His research focus at Nebraska was the distribution and life cycle of the black turfgrass beetle, *ataenius*.

Colleen Smalter Pederson, GCSAA director of education, had been serving as technical editor in addition to her regular duties. Pederson will continue to concentrate on GCSAA's growing educational programs and other new program assignments.



Want Information About An Employee Right-To-Know Video and Another On Pesticide Use?

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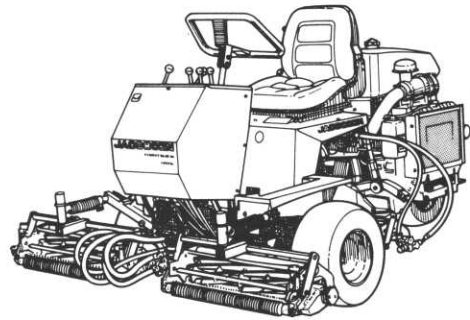
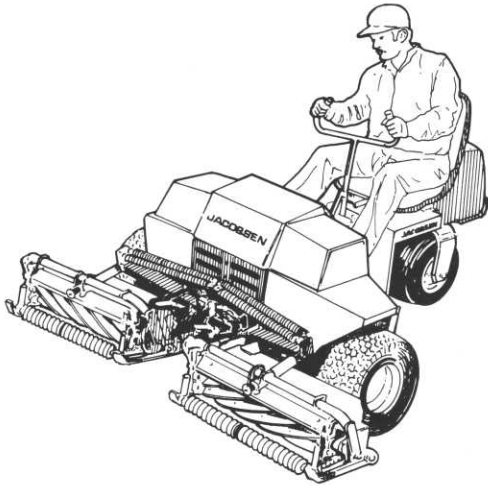
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For more about information, MGCSA President Kerry Glader invites you to call him at 612/253-5250.

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GREEN CLIPPINGS

Guest speaker at the MGCSA's April 16 meeting at Owatonna Country Club will be **Dwayne Schindler** from the University of Minnesota/Waseca. There is no charge to Class AA (Life) members at the April, May, June, July and October meetings. Please send in your reservation if you plan to attend. We would like to see more of you at these sessions...The Board has approved the recommendation of the Research Committee to allocate \$10,750 to help fund the **Baker Park Leachate Project** in 1990 and 1991. Also approved was the sum of \$5,000 to assist **Dr. Watschke** at Penn State in his study on Movement of Fertilizer Nutrients and Pesticides from Turfgrass Sites...**John MacKenzie, Jr.**, Superintendent at North Oaks, donated the \$50 check he

received for his article printed in the March Hole Notes to the Research Fund...As this issue went to press, 175 were pre-registered for the Mini-Seminar at Lafayette Club...Watch for a survey regarding **Winter Golf Course Preparation** from the Research Committee. There will be four \$50 certificates awarded at a drawing to those who respond...**Dale Wysocki**, Superintendent at Faribault Golf & Country Club, has agreed to join **John Harris** on the Bylaws Committee, which will be taking a close look at the bylaws and recommend changes, if deemed necessary, to the Board...Congratulations to **Jim Wodash** and his staff at Willmar Golf Club for their recently completed renovation of the clubhouse and grounds. Jim promises a future article on his experience...**Mogren Bros.** is the new Buckner irrigation turf distributor for the State of Minnesota. Buckner, which has supplied the turf industry with products since 1912, has introduced a brass cam drive valve-in-head rotor in a plastic case for greens and tees...Mogren Bros. all so announces the promotion of **Mitch Regal** to sales manager and **Wayne Schwanz** to outside salesman.

Par Aide Moves To New Plant

Effective March 5, the new headquarters plant of Par Aide Products Company became fully operational. Located at 3565 Hoffman Road East in St. Paul, the new facility improves the operating efficiency of both manufacturing and shipping.

"For many years we've had a 'same-day-shipping' policy," said President Steve Garske, "but it has been more and more difficult for our people to maintain it. With the tremendous increase of both our domestic and export business over the past few years, this new plant became an absolute necessity."

According to Garske, the new building also includes an expanded area for research and development, designed to speed up the introduction of new products in the coming months.

For product ordering, service or any other company communications, all calls and letters should be directed to Par Aide Products Co., 3565 Hoffman Road East, St. Paul, Minn. 55110-5376. (FAX: 612-779-9854; PHONE: 612-779-9851).

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Cordless 3/8" reversing drill
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includes case!

Milwaukee Sawzalls

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Model #6507	\$229.00	\$134.95
Model #6508	\$229.00	\$132.95

GCSAA Elects 1990-91 Board Of Directors

Gerald L. Faubel, CGCS, Saginaw Country Club, Saginaw, Mich., was elected president of the Golf Course Superintendents Association of America (GCSAA) during the association's annual meeting in Orlando, Fla., on Feb. 26.

Faubel succeeds Dennis D. Lyon, CGCS, Aurora, Colo., who as immediate past president will continue to serve for a year as director.

Stephen G. Cadenelli, CGCS, Metedeconk National Golf Club, Jackson, N.J., was elected vice president. Re-elected as a director and appointed secretary/treasurer was William R. Roberts, CGCS, Lochmoor Club, Grosse Pointe Woods, Mich.

Also re-elected as directors were Joseph G. Baidy, CGCS, Acacia Country Club, Lyndhurst, Ohio, and Randall P. Zidik, CGCS, Rolling Hills Country Club, McMurray, Pa.

Charles T. Passios, CGCS, Hyannisport Club, Hyannisport, Mass., was appointed to the board to fill Cadenelli's vacated director's position.

Gary T. Grigg, CGCS, Shadow Glen Golf



1990-91 GCSAA BOARD OF DIRECTORS—Sitting from left are Stephen G. Cadenelli, CGCS, vice president; Gerald L. Faubel, CGCS, president, and William R. Roberts, CGCS, secretary-treasurer. Standing from left are Gary T. Grigg, CGCS; Randall P. Zidik, CGCS; Charles T. Passios, CGCS; Dennis D. Lyon, CGCS, immediate past president; Joseph G. Baidy, CGCS, and Randy Nichols, CGCS.

Course, Overland Park, Kan., and Randy Nichols, CGCS, Cherokee Town & Country Club, Dunwoody, Ga., continue

serving terms as directors.

Officers serve one-year terms, and directors are elected to two-year terms.



About the Cover Photo

Presenting a \$1,000 check to William Bengeyfield, right, retiring United States Golf Association Green Section Director, and James Snow, USGA Green Section Director, is Kerry Glader, St. Cloud Country Club, MGCSA President. The contribution is for the USGA-GCSAA Research Project. Glader also presented a \$1,000 check to Dennis Lyons, GCSAA President, as part of the Minnesota association's continuing support of the GCSAA Research & Scholarship Fund. They were given at the Golden/Platinum Tee Club Reception in Orlando, Fla. on February 25.

Remaining 1990 MGCSA Meeting Sites

Date	Site	Event
April 16	Owatonna Country Club	
May 15	Oak Glen Country Club	
June 11	Stone Brooke Golf Club	
July 9	Northfield Golf Club	
August 13	Hazeltine National Golf Club	MGCSA Championship
Sept. 24	Dellwood Hills Golf Club	Stodola Scramble
October 8	Baker Park Golf Club	

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