GETTING THE MOST OUT OF UREA

By Dr. Wayne R. Kussow
Department of Soil Science
University of Wisconsin-Madison

Urea is a very popular turf fertilizer. The reasons for this are low cost and high water solubility. Urea, with a unit nitrogen cost ranging from one-fourth to one-third that of slow release nitrogen fertilizers, is definitely a low budget material. Solutions of urea have a near-neutral pH and are compatible with most pesticides and micronutrient sources. Urea is also the material of choice for blending with slow release nitrogen fertilizers to provide them with quick response capability.

Despite all of the apparent advantages of urea as a turf fertilizer, some turf managers are reluctant to use it and others are dissatisfied with turfgrass responses when urea is applied. Reluctance to use urea, particularly in the prilled form, generally stems from fear of burn or overstimulation of turfgrass growth. Disappointments with the product range from slower response than anticipated to response of short duration. All of these concerns reflect lack of familiarity with urea, the chemical reactions it undergoes when applied to turf and the potential consequences of these reactions.

Urea is an organic compound. When added to water, it dissolves by separating into individual molecules. Nitrogen in these molecules cannot be directly utilized by plants. The urea molecules must first undergo hydrolysis, a chemical reaction involving the urea, the enzyme known as urease and water. The products of this reaction are ammonium and carbonate ions. It is only after hydrolysis occurs and the nitrogen in urea is released in the form of ammonium ions that turfgrass use of the nutrient becomes possible. This is true regardless of whether urea is soil applied as prills or foliarly applied as a urea solution.

The production of carbonate ions during urea hydrolysis is unavoidable and a cause of problems that can occur when using urea on turf. The carbonate ions react with water to produce bicarbonate and hydroxyl ions. The latter cause the pH of the solution at the reaction site to increase, sometimes to a level where ammonium ions begin to convert to ammonia gas. If the amounts of ammonia generated are substantial and the gas is free to escape into the atmosphere, one of two or both events will occur; there is significant loss of fertilizer nitrogen and the ammonia liberated may be sufficient to burn the turfgrass.

Getting the most out of urea first requires an awareness of what controls its rate of hydrolysis. The key factors are air temperature and moist soil and plant surfaces. Level of urease activity is generally of secondary importance because turfgrass shoots and thatch typically have urease activity levels 20 to 30 times greater than the underlying soil. As such, urease activity rarely limits the rate of urea hydrolysis in turf.

Temperatures of 50° F or less slow urea hydrolysis to the extent that color response of turfgrass may not occur until 10 to 14 days after soil application. This is one potential cause of slower than anticipated response of turfgrass to urea and is why our European colleagues often refer to urea as an intermediate rather than a fast release turf fertilizer. As temperatures climb above 50° F, urease hydrolysis rates rapidly increase and peak at about 90° F. Therefore, volatilization loss of nitrogen from urea increases steadily in the temperature range of 50 to 90° F.

How much urea-nitrogen volatilizes at a given temperature depends on the rate of urea application and other ambient conditions following application. When temperatures favor rapid urea hydrolysis, nitrogen loss is directly proportional to the amount of urea applied. The ambient conditions conducive to volatilization loss from urea are moist turfgrass, thatch or soil surfaces at the time of application and rapid drying shortly thereafter.

When urea is applied at air temperatures ranging between 50 and 90° F and the turfgrass response is less than expected and of short duration, volatilization loss of urea-nitrogen is the most likely reason. This of course, assumes that soil levels of other required nutrients and moisture supply are adequate for normal turfgrass growth.

Management-wise there are several things that can be done to minimize volatilization loss of nitrogen from urea applications. Contrary to popular opinion, foliar rather than soil application of urea does not reduce nitrogen loss. Rather, research has shown that when urea is foliarly and soil applied at the same rate, loss from foliar applications is two to three times greater than from soil applications.

When urea is soil-applied in the form of prills, the most effective means for reducing nitrogen volatilization loss is to irrigate shortly after application. As little as 0.2 inches of water can reduce nitrogen losses to one percent or less under most circumstances. More water is required if the turf is thatchy. "Shortly after urea application" means irrigation within 24 hours or less. The higher the air temperature when the urea is applied, the quicker the irrigation should begin. At 75° F, volatilization cannot be detected for the first 10 to 12 hours after urea application. At 85° F to 90° F, volatilization begins in as little as four hours after the urea is applied.

Reduction of nitrogen loss from prilled urea can also be achieved by reducing the rate of application as air temperatures increase. My experiences last summer showed that in the temperature range of 50 to 60° F, no burning of turf occurs at urea rates as high as 1.2 lb N/1000 ft². However, at about 80° F the safe upper rate limit drops to 0.8 lbN and at 90° F is approximately 0.4 lbN.

Control of nitrogen volatilization from foliar applications of urea is, in some ways, more complex than with soil applications of urea prills. The reason is that irrigation shortly after application reduces foliar absorption of the urea to 5 percent or less, which, according to our research, is insufficient to induce a perceptible color improvement in the turfgrass. The best management strategy for foliarly applied urea is late afternoon or early evening application followed by irrigation the next day before the turfgrass dries off. Hydrolysis of foliarly applied urea begins within one hour after application and peaks six to 12 hours later. Drying of the foli-

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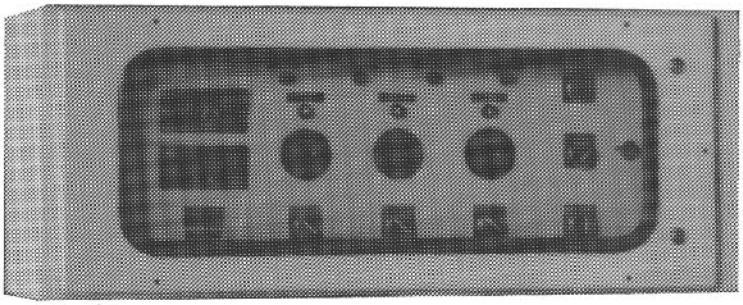

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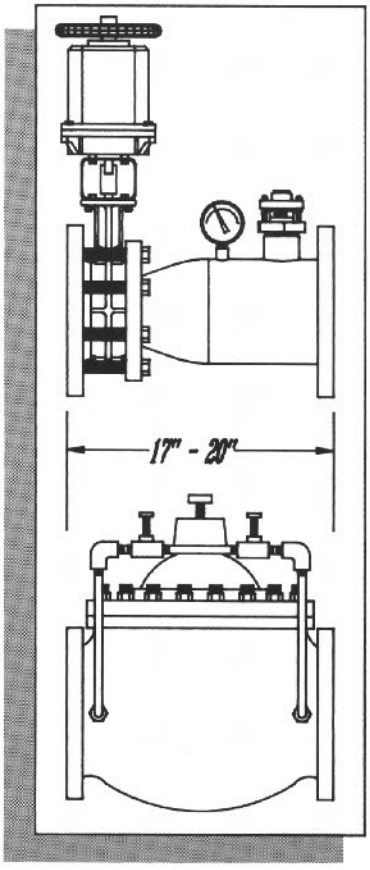

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age after this period of time has been shown to result in loss of as much as 23 percent of the nitrogen applied.

Finally, overstimulation of turfgrass with urea is usually a rate of application problem. Unlike with slow release nitrogen fertilizers, all the urea-nitrogen is available to the turfgrass once hydrolysis has taken place. Lighter and more frequent applications of urea are required. My experience is that prilled urea must be applied at least once a month to maintain good color in closely mown, highly maintained turf. For less intensively maintained turf, such as home lawns and athletic fields, good color can be achieved with urea; application intervals of six to eight weeks are recommended. The actual length of the interval is determined by turfgrass growth rates.

1988 WTA FIELD DAY

The 1988 Wisconsin Turfgrass Association Field Day will be held on August 23 at the Yahara Hills Golf Course in Madison. Again, the event has a distinct WGCSA flavor. WGCSA members Tom Harrison and Tom Schwab are chairmen for this sixth annual education and equipment program. WGCSA members Irv Graf, Ron Schara and Don Steinmetz are hosting the occasion on their 36 hole City of Madison golf couse, as they will for 1989 and 1990.

Watch your mail for registration details.

1988 SYMPOSIUM DATES SET

Jim Spindler has announced a slight change in tradition for the Wisconsin Golf Turf Symposium for 1988. The days this year will by **Tuesday** and **Wednesday,** October 25th and 26th. Set those dates aside and mark your calendar today!

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Twenty-Year Observations on Snow Mold Control

By Dr. Gayle Worf
Department of Plant Pathology
University of Wisconsin-Madison

I was asked recently to prepare a report covering our experiences with snow mold over the past two decades. It's a challenge to dust off old data, examine them against more recent observations, and try to see what trends and ideas have stood the test of time.

A good example of an old axiom that was accepted by everyone until about a decade ago was the firm belief that fall fertilization would substantially increase snow mold and winter injury problems. While there are probably some who are still very nervous about that possibility, and are waiting for the year that proves the old story to be correct, I believe most people are in the camp that says reasonable applications, e.g., up to a pound of N, won't cause snow mold problems, and will probably aid in any spring recovery that is required.

Another one was the assumption that mercurials were "always" effective, and that any failure was simply due to the application or the applicator. And if you had a problem one year, all that was necessary was to increase the dosage (there wasn't too much concern about label rates 20 years ago!) Or maybe—we thought—it was applied "too early". It was almost a contest to see who could be the last one to apply his chemical. (The word "he" was purposely chosen. There were no women in the business then—and still not very many!!) The assumption was that the later the application date, the better the performance of the chemical, and the greater the chances of remaining effective throughout the long, hard winter.

Most of us have backed off the very late application dates, realizing that we can get trapped by earlier than expected permanent snowfalls like we did on November 8 in 1985.

The ideal treatment date is still somewhat elusive. Our trials the last few years have included that question. We've also had some help these past two years from several superintendents who have made earlier versus later applications for comparison. Fortunately for the courses—but unfortunately for the question—snow mold activity has generally been too low to give us good readings in most instances.

Here's a general summary of observations and thoughts we've made on snow mold control over the years:

1. You can't predict snow mold from one season to another. Last year's experiences don't help much, though they may indicate the most sensitive areas on your course;
2. No cultural practices will control snow mold, including top dressing, greens covers, or fertility manipulation. Late season snow removal and/or treating with Milorganite or perhaps lampblack to absorb heat from late winter sunshine can sometimes help;
3. There's no such thing as a "no fail" treatment when snow mold conditions are severe enough! However, you can *greatly* reduce the damage with a few well chosen treatments, even under these circumstances;
4. Inorganic mercuries still give us the most dependable base treatment in tough situations. This is in spite of the fact that some injury to the turf is often encountered by mercury application. But they should be supplemented with PCNB or chloroneb, depending on location, to broaden spectrum and dependability. Combinations work much better than simply increasing the rate of one chemical. Besides, you'll probably exceed the legal (label) rates on the package before you get the success you're looking for;
5. Other registered chemicals have been effective for courses under relatively low disease pressure, especially when summer, or at least early fall disease control programs have included considerable fungicide application;
6. Granular products are usually as effective as sprays on an active ingredient basis, although in any given year one formulation may look better than the other;
7. We can successfully apply over light snowfalls, e.g., one or two inches without trouble, and chemicals work equally well when applied dry or in the rain. But don't expect them to work through heavy snow;
8. Late season nitrogen applications (October 20-November 20) have little effect on snow mold control or activity. It sometimes helps with early spring repair work that may be needed;
9. Fusarium patch can sometimes cause injury before snows occur, and before the usual snow mold control is applied. That's another reason for considering early fall "supplemental" treatments;
10. Midwinter treatments have not been needed or useful for us to provide protection under late spring snows that bring about late snow mold activity. For us, it's often not possible anyway! Nor have heavy late fall or winter rains reduced efficacy. However, they probably won't protect against fusarium patch after temperatures warm up and some rains occur in April.
11. Depending on your part of the state, applications between October 25 and November 5 may be the best compromise on treatment dates.

Hobbies

SKIP'S HOBBY'S A KICK!

By Monroe S. Miller

Tennis promoters are nervous. There has been a decline in the interest in their sport and they think they know why. Soccer. There has been a tremendous upsurge in the popularity of soccer—it's being played instead of football, instead of baseball and softball, even instead of basketball. It has become a year 'round sport and now can lay claim as the largest youth participation sport in America. It has gained favor among boys *and* girls. It's gained the favor among those of the younger generations; it's the sport they all seem to be growing up with.

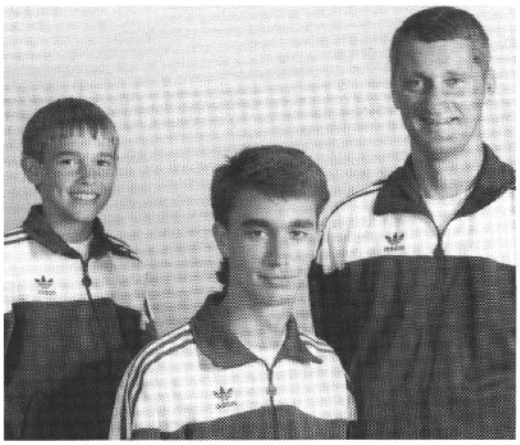
Even a few of the older generations have adopted this sport, guys like Skip Wilms. For a person who has always been keenly interested in athletics, Skip's acceptance of soccer as his sport of choice is high praise.

Skip is one of those fortunate people who seems to be good at any sport he plays; he is a natural athlete. WGCSA members know he can play a fiercely competitive game of golf. Most don't know that this man played professional baseball as a member of the St. Louis Cardinals farm system, reaching the AA level of competition.

So when son Bill's soccer team needed some help, Skip volunteered. That was ten years ago. He immediately recognized that this was a great game for exercise, that it was good fun and that it was inexpensive. He was hooked.

At first, Skip helped in locating playing fields and marking them for play. Despite his lack of knowledge of soccer, he was in good company. Few adults were knowledgeable ten years ago. Anyone who knows Skip at all would guess he didn't stay uninformed for long. He started his soccer education by enrolling in a course in Illinois taught by the U.S. Soccer Federation. Upon completion he received an "F" license from the USSF. He completed the organization's "E" and "D" licenses at the University of Wisconsin in Madison. The "F" license involved a two-day commitment of time. But the "E" and "D" level required 50 hours of work apiece. All three of them included a written examination. The Federation offers an "A" license, its highest level of proficiency and competence, and Skip has achieved that as well.

Skip became even more serious about his new hobby. After receiving his "D" license from the Soccer Federation, he spent each of the next two winters in Florida attending the National Soccer Coaches Association Academy. Successful completion of these courses, each a week long, allows diploma holders to coach soccer at its highest level, even college and professional. The Academy measures abilities through oral and written exams and from field testing. The field exam includes an assessment of personal playing ability, coaching techniques and knowledge of the subtleties of the game. It is very similar to the PGA program.



Denny, Bill and Skip Wilms.

Although a good and serious player (he was on an all-star SE Wisconsin amateur team that played Portugal recently and the only one on *his* team who spoke English!), Skip's involvement today centers around the coaching of his two young sons, Bill and Denny. Everyone in the family is a soccer "junkie". Nancy Wilms loves the game as a spectator and enjoys watching her family play.

Bill Wilms is going to attend the UWM next fall and will play on their college team. A player since the age of eight, Bill has accomplished much. His team has been the state soccer champions for two years. He has traveled all around the country playing soccer and recently made the pre-Olympic team. His brother Denny seems destined for the same kind of success—his team won the state championship two years ago and is bidding again this year. Along with their dad, they have put away nearly seventy trophies on the shelves at home, and share many memories.

Skip played golf at least twice a week when he was the course superintendent at West Bend Country Club. Nowadays he is lucky to play a dozen rounds a year. Soccer has helped him get away from the pressures of his golf course. He finds soccer an excellent way to burn up physical energy and to relieve mental stress. The coaching gives him enjoyment as he sees kids acquire an understanding of the game, a sense of commitment and a feel for dedication. Even the fund-raising he does—Bill's team spends about $6,000 a year for uniforms, referees, field rentals and equipment—gives great pleasure in terms of accomplishment. The ten to twelve hours a week Skip invests in soccer are worth every minute.

I've seen him at work with his hobby. His team has played Middleton and Madison area amateur teams many times on a field on the shore of Lake Mendota, not far from my home. I can testify to his enthusiasm and how it infects his young players.

It is classic Skip Wilms, even at play!

LIFE IN THE "PAST" LANE

Fashions changes and so do people—from the bicentennial year are, L to R, Jim Belfield, Al Vrana, Wayne Otto and Deke DeCramer. Where did all of Wayne's hair go?

THIRTY YEARS AGO. . .

Wisconsin Golf Course Superintendents Association 1958 Directory

Membership directories are seldom thought of being anything but very functional publications. All they usually contain are current telephone numbers and current mailing addresses.

But an old directory, probably much like a telephone book from years past, tells more than you might imagine. The 1958 WGCSA Directory, forwarded to this editor from Rod Johnson and reproduced here, gives an interesting look back to 30 years ago.

Name	Club	Mailing Address	City & State
1. Oscar Behnke	Riverview C.C.	116½ S. Pierce Ave.	Appleton, WI
2. Joseph Kneice	Reid Municipal C.C.	East Fremont St.	Appleton, WI
3. John Taylor	Butte des Morts C.C.	Route 2	Appleton, WI
4. Gordon Brann	Maxwelton Braes G.C.		Bailey's Harbor, WI
5. Robert Schulz	Old Hickory G.C.	153 Gould Street	Beaver Dam, WI
6. Harvey Krahn	Beloit C.C.	702 Bayliss Ave.	Beloit, WI
7. Fritz Reinhardt	Morse Hills G.C.	1631 Prairie Ave.	Beloit, WI
8. Albert Ebbers	Brown's Lake G.C.	405 McHenry St.	Burlington, WI
9. Harry Stewart	Lake Ripley C.C.		Cambridge, WI
10. Carl Wicks	Hickory Hills G.C.	Route 1	Chilton, WI
11. Martin Mikulski	Riverside G.C.		Clintonville, WI
12. Wesley Merrifield	St. John's Golf Course		Delafield, WI
13. Joseph Cronin	Delbrook Municipal G.C.		Delavan, WI
14. Walter McSweeney	Lake Lawn Hotel G.C.		Delavan, WI
15. Joe Fox	Big Sand Lake G.C.		Eagle River, WI
16. Arthur Post	Rivermoor C.C.	Route 1, Box 39	East Troy, WI
17. Erv Bertram	Westmoor C.C.	10 S. Moorland Rd.	Elm Grove, WI
18. Frank A. LaRoy	Alpine Resort G.C.		Egg Harbor, WI
19. Lowell G. Hanson	Peninsula Park G.C.	State of Wisconsin Conservation Dept.	Fish Creek, WI
20. Elmer Berleton	South Hills C.C.	240 Boyd St.	Fond du Lac, WI
21. Fred Lawrence	College Camp G.C.		Fontana, WI
22. Greenskeeper	Koshkonong Mds. G.C.	Route 3, Box 72	Fort Atkinson, WI
23. John Andrews	Fox Lake G.C.	210 Davis St.	Fox Lake, WI
24. C.S. Porter	Fox Lake G.C.		Fox Lake, WI
25. Alan Kress	The Golfbowl G.C.	Route 4	Franksville, WI
26. Clarence Koehn	Nippersink G.C.		Genoa City, WI
27. Ray Sorenson	Oneida C.C.	Route 1, Oneida	Green Bay, WI
28. Nels Sorenson	Brown County G.C.	Route 1, Oneida	Green Bay, WI
29. Hans Schaller	Shorewood C.C.		Green Bay, WI
30. Dominic Blinkiewiecz	Lausonia G.C.	American Baptist Assembly	Green Lake, WI
31. Wm. Fisher	Whitnall Park G.C.	Route 1, Box 81	Hales Corners, WI
32. Frank Bradt	Hartford G.C.	202 Church St.	Hartford, WI
33. Lee Hawkins	Hartford G.C.		Hartford, WI
34. Jiggs Wenzel	Hartford G.C.	503 Cedar St.	Hartford, WI
35. Olaf Olson	Janesville C.C.	2615 Magnolia Ave.	Janesville, WI
36. N.J. Neis	Meadow Springs C.C.		Jefferson, WI
37. Bert Barrows	Kenosha C.C.	Route 4	Kenosha, WI
38. Del Stollenwerk	Washington Park G.C.	1616 57th St.	Kenosha, WI
39. Richard Lindl	Petrified Springs G.C.	Route 4, Box 672	Kenosha, WI
40. Andrew Janda	Alaska C.C.		Kewaunee, WI
41. Harry Kubiack	La Crosse C.C.		La Crosse, WI
42. Audie Williams	Hillmoor G.C.	1339 Pleasant St.	Lake Geneva, WI
43. L.C. Huntress	Lake Geneva C.C.	1030 Dodge St.	Lake Geneva, WI
44. Superintendent	Tyranena G.C.		Lake Mills, WI
45. Karl Schlicht	Blackhawk C.C.	4500 Old Middleton Rd.	Madison, WI
46. Tom Tucker	Municipal G.C.	Park Dept. City Hall	Madison, WI
47. Roger Larson	Maple Bluff C.C.	419 Kensington Dr.	Madison, WI
48. Walter Bechtal	Monona G.C.	2521 Moland Avenue	Madison, WI
49. Erv Graf	Nakoma C.C.	616 Glenway	Madison, WI
50. Erv Graf, Jr.	West Side Municipal G.C.		Madison, WI
51. Superintendent	Branch River C.C.	Branch River	Manitowoc, WI
52. Vern Schellpfeffer	Mayville G.C.		Mayville, WI
53. Mark Prindle	Ridgeway C.C.	Route 2	Menasha, WI
54. H.R. Hannemann	North Shore C.C.	Route 1, Box 164	Menasha, WI
55. Frank Musbach	Blue Mound C.C.	10633 W. Burleigh St.	Milwaukee 10, IW
56. Arnold Schaefer	Brown Deer Park G.C.	7897 N. Green Bay Ave.	Milwaukee 9, WI
57. Lester Verhaalen	Brynwood C.C.	6800 W. Good Hope Rd.	Milwaukee 18, WI
58. Fred Zimmerman	Currie Park G.C.		Milwaukee 10, WI
59. E.J. Levenhagen	Greenfield Park G.C.	12225 W. Greenfield	Milwaukee 14, WI
60. Phil Czech	George Hansen G.C.		Milwaukee 13, WI
61. Richard Wunder	Lake Park G.C.	3233 Lincoln Memorial Dr.	Milwaukee 2, WI
62. Ray Greiten	Lincoln Park G.C.	435 W. Hampton Ave.	Milwaukee 17, WI
63. John Stampfl	Milwaukee C.C.	8010 N. Range Line Rd.	Milwaukee 9, WI
64. Charles Shiley	North Hills C.C.	Route 3, Box 288A	Milwaukee 16, WI
65. Harvey Kolbe	North Shore C.C.	134 E. Fairy Chasm Rd.	Milwaukee 17, WI
66. Frank Maurina	Tripoli C.C.	5032 W. Good Hope Rd.	Milwaukee 18, WI
67. Clifford Decker	Tuckaway C.C.	3200 W. Grange Ave.	Milwaukee 15, WI
68. Clarence Schroeder	Bridgewood G.C.	Route 1	Neenah, WI
69. Mark Prindle	Ridgeway C.C.	Route 2	Neenah, WI
70. Don Miller	Lac La Belle G.C.		Oconomowoc, WI
71. Hilbert Wegner	Oconomowoc G.C.	Route 4, Box 17	Oconomowoc, WI
72. Jack Frahm	Oshkosh C.C.	Route 2, Box 17C	Oshkosh, WI
73. Howard Gabbey	Johnson Park G.C.	6300 Northwestern Ave.	Racine, WI
74. Ray Mertens	Meadowbrook C.C.		Racine, WI
75. John Crewe	Racine C.C.	1938 Grange Avenue	Racine, WI
76. Francis Iverson	Shoop Park G.C.	2314 Kinzie Avenue	Racine, WI
77. Tony Kozenski	Washington Park G.C.	1522 Winslow St.	Racine, WI
78. Barney Schwenkhoff	Reedsburg C.C.		Reedsburg, WI
79. Walt Stepanik	Wausau C.C.	Route 1	Schofield, WI
80. Wm. Eickberg	Pine Hills C.C.	Route 2	Sheboygan, WI
81. Fred Thiel	Riverdale G.C.		Sheboygan, WI
82. Evald Fisher	Grant Park G.C.	242 Hawthorne Ave.	South Milwaukee, WI
83. John Nettum	Stoughton C.C.		Stoughton, WI
84. Don Fredrickson	Leatham Smith G.C.	Memorial Drive	Sturgeon Bay, WI
85. Ronald Verhaalen	Ozaukee C.C.	Route 2	Thiensville, WI
86. Ray Habelman	Hiawatha C.C.	510 Cary St.	Tomah, WI
87. William Ball	Maple Birch G.C.		Tomahawk, WI
88. Frank Kress	Red Barn G.C.		Twin Lakes, WI
89. Richard Becker	Big Foot C.C.	Box 49	Walworth, WI
90. George Wuestenberg	Watertown C.C.	417 College Ave.	Watertown, WI
91. Albert Decker	Merrill Hills C.C.	Route 2, Box 156	Waukesha, WI
92. Floyd Sawyer	Waupaca G.C.		Waupaca, WI
93. Tom Vande Zande	Rock River C.C.	513 E. Main Street	Waupun, WI
94. Paul Jensen	W.A. Roberts C.C.	South 124th St.	West Allis 14, WI
95. Arnold Wessel	Port Washington C.C.	Route 1, Box 215	West Bend, WI
96. Mobile Marriucie	West Bend C.C.		West Bend, WI
97. Frank Ranney	West Salem G.C.		West Salem, WI
98. Mr. Schoellkopf	Whitewater C.C.		Whitewater, WI
— Commercial Members —			
99. Eric Madison	Appleton Park Board		Appleton, WI
100. Elgie Kinnamon	Kinnamon Saw & Mower	Highway 12	Baraboo, WI
101. A.J. Horst	Horst Engr. & Equip. Co.	305 E. Main St.	Chilton, WI
102. Robert Reinders	Reinders Brothers	P.O. Box 428	Elm Grove, WI
103. Nelson Hagen	Golf & Garden Equip. Co.		Elm Grove, WI
104. R. Christopherson	Wisconsin Turf Equip. Co.	1917 Pleasant St.	Janesville, WI
105. N.S. Koos & Son Co.		4500 13th St.	Kenosha, WI
106. R.R. Bond	Old Orchard Nurseries	Box 350	Madison, WI
107. Billy Sixty	Milwaukee Journal	333 W. State St.	Milwaukee 3, WI
108. S.P. Graham	Milwaukee Sewerage Co.	3229 N. Oakland Ave.	Milwaukee 11, WI
109. O.J. Noer	Milwaukee Sewerage Co.	5466 N. Port Wash. Rd.	Milwaukee 17, WI
110. R.L. Ryerson	R.L. Ryerson Co.	5466 N. Port Wash. Rd.	Milwaukee 17, WI
111. R.G. Howe	R.L. Ryerson Co.	5466 N. Port Wash. Rd.	Milwaukee 17, WI
112. G. St. George	R.L. Ryerson Co.	5466 N. Port Wash. Rd.	Milwaukee 17, WI
113. Carl Erickson	R.L. Ryerson Co.	5466 N. Port Wash. Rd.	Milwaukee 17, WI
114. Elmer Berg	Worthington Mower	3210 S. Walmer Rd.	Milwaukee 19, WI
115. Frank M. Boeing	Armours	Box 364, Lac LaBelle Dr.	Oconomowoc, WI
116. Frank L. Testwuide	Schreier Malting Co.	704 S. 15th St.	Sheboygan, WI
117. Warren Roseman	Roseman Mower Corp.	141 W. Jackson Blvd.	Chicago, IL
118. Jesse M. Taggert		33 Bismark Street	Danville IL
119. William Stupple	Exmoor Golf Club		Highland Park, IL
120. Agar M. Brown		P.O. Box 106	St. Charles, IL
121. Tom Mascaro		West Point	West Point, PA
122. O.R. Lauson	Jacobsen Mfg. Co.		Racine, WI

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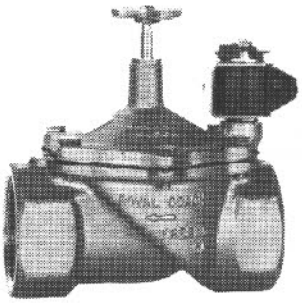
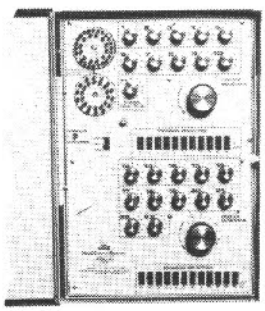


Electric Valves



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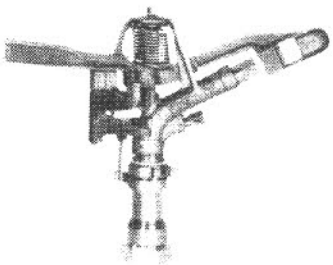

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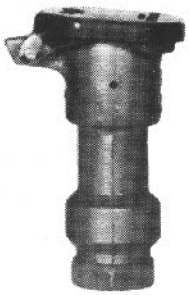

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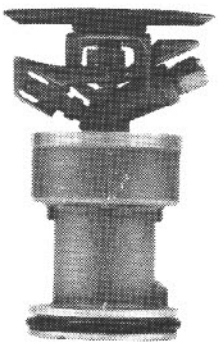

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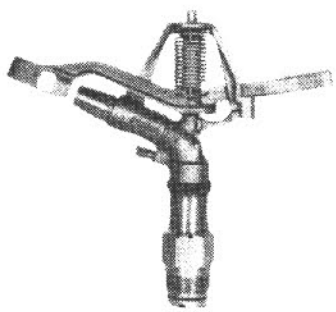

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THE NATIONAL DIRECTOR SPEAKS AT SHEBOYGAN

By Mark Kienert

USGA Green Section National Director Bill Bengeyfield.

Bill Bengeyfield, National Director of the United States Golf Association Green Section, was the featured speaker at the May meeting of the WGCSA. The meeting was held at Pine Hills Country Club in Sheboygan on May 23 and was hosted by Rod Johnson.

Coincidently, the meeting date was also Media Day at the Kohler Company's new golf course, Black Wolf Run. Golf Course Superintendent Marc Davison arranged for WGCSA members to see this new Pete Dye creation that morning.

Mr. Bengeyfield chose turfgrass research as the focus of his remarks. The USGA is at the halfway point in a major fund raising effort for turf investigations. He was able to point to progress made thus far and painted an optimistic picture of results they hope for in the last half of the program. His comments fell on receptive ears, especially since Wisconsin is in the early stages of raising money for the O.J. NOER CENTER for TURFGRASS RESEARCH.

Joining the WGCSA members for dinner were two other special guests - Herb Kohler and Pete Dye. Mr. Kohler, the top executive of the Kohler Company, is the prime reason Black Wolf Run is now part of the Wisconsin golf course community. Mr. Dye, as everyone knows, created the unique Kohler golf course.

As he has done so often in the past, Rod Johnson did the perfect job of planning the entire day, right down to the great weather. His course was in excellent condition, the clubhouse was beautiful, and the meals and service were outstanding.

The comment made to me by one of Rod's peers was "I can't remember when I've seen a golf course as finely groomed as Pine Hills." A splendid job, Rod!

Herb Kohler and USGA Green Section Agronomist Jim Latham.

The O.J. NOER CENTER was the big winner of a "Giant Skins Game" organized by R.J. Thirty-six out of thirty-nine teams entered this on-site event. Skins winners were: Acker, Pinkerton, Peterson, Shaw, Emerich, Weise, Feldman, Swift, van Valin, Smith, Frazier, Ball and Mertz.

Event prize winners went to Dick Evenson with a 74 for low gross honors; longest putt to President Roger Bell and closest to the pin in three shots went, by default, to Chad Ball. He was in the cup for an eagle three. Longest drive went to Pro Rick Swift and closest to the pin to Dick Evenson.

Continued on page 23.

Palmer Still the Best

Turf-Type
Perennial Ryegrass

That's right. For the second year in a row Palmer turf-type perennial ryegrass scored number one in the National Ryegrass tests conducted by the U.S.D.A. coast to coast:

U.S.D.A. National Perennial Ryegrass Test
Turf Quality 1-9 (9 = Best)

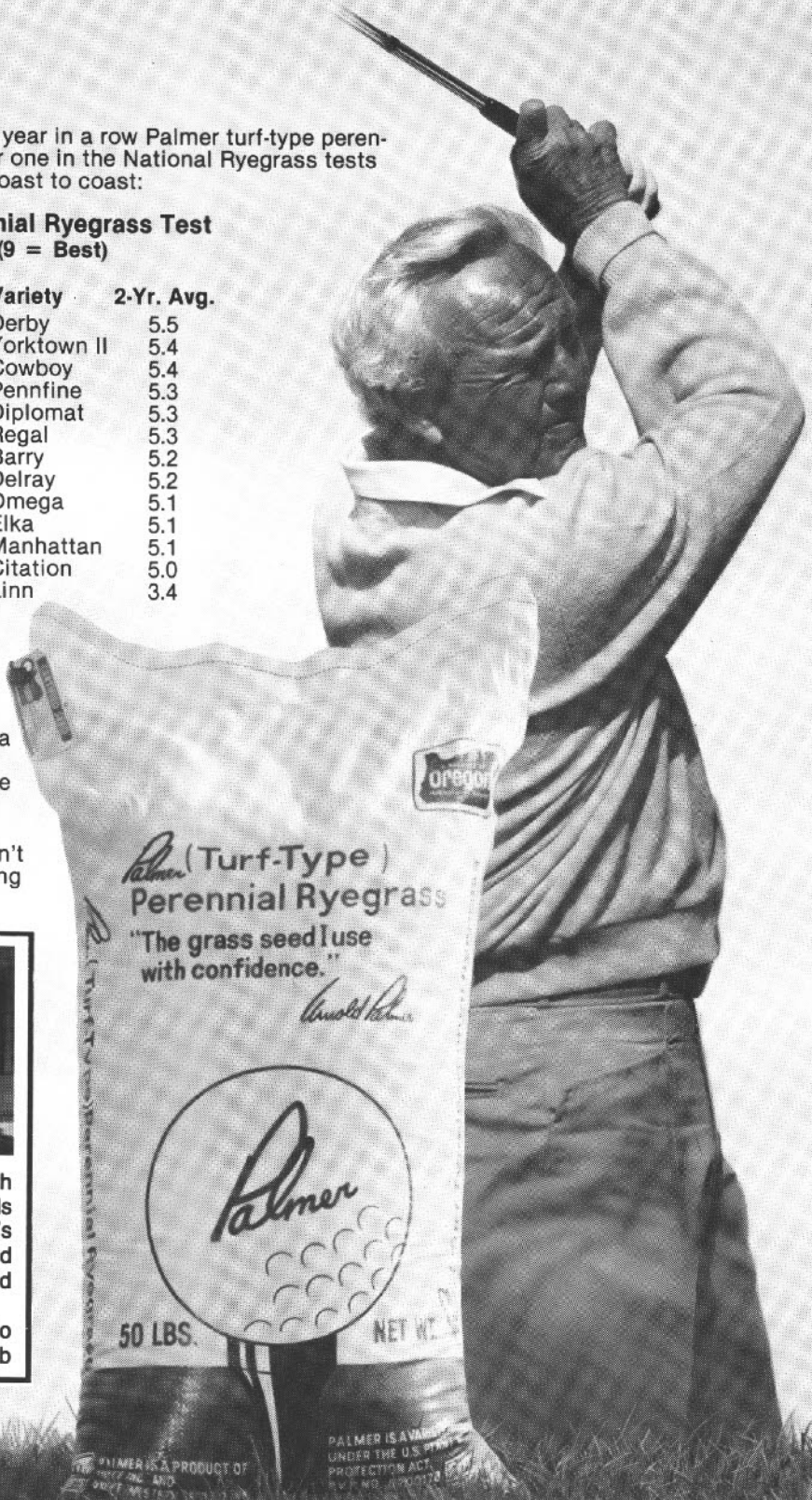
Variety	2-Yr. Avg.	Variety	2-Yr. Avg.
Palmer	5.9	Derby	5.5
Gator	5.9	Yorktown II	5.4
Prelude	5.8	Cowboy	5.4
Repell	5.8	Pennfine	5.3
Tara	5.8	Diplomat	5.3
Premier	5.7	Regal	5.3
Citation II	5.6	Barry	5.2
Manhattan II	5.6	Delray	5.2
Blazer	5.6	Omega	5.1
All Star	5.6	Elka	5.1
Ranger	5.6	Manhattan	5.1
Birdie II	5.5	Citation	5.0
Fiesta	5.5	Linn	3.4
Pennant	5.5		

It's no wonder courses like Bay Hill in Florida, Shinnecock in New York, PGA West in California and Sahara in Nevada are only a few of those that are demanding the excellent performance of Palmer.

As a turf professional wouldn't it be nice to know you're using the best? Use Palmer.

"Kellogg's supplied us with Palmer and other quality seeds that we needed. Kellogg's personnel are experienced and their recommendations and service is excellent."

—Wayne Otto
Supt. of Ozaukee Country Club



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