

**Par Ex® introduces a family of mid-sized fertilizer grades designed to meet the needs of today's closely-mowed turf.**



Par Ex® and IBDU® are registered trademarks of Vigoro Industries, Inc.

## WHY MID-SIZE GRADES FOR CLOSELY-MOWED TURF?

**BECAUSE** fairway-sized particles are too large to apply to closely-mowed turf.

**BECAUSE** greens-sized products can be difficult to spread.

**BECAUSE** IBDU® is the most reliable, most consistent source of slow-release nitrogen.

For more information contact:  
Tom Skinner  
Specialty Products  
Territory Manager  
319/524-8912

## Tee to Green-Six Keys To Successful Turf

**NITROFORM®**  
Ureaform, a slow-release nitrogen fertilizer available in three convenient formulations, Powder Blue®, Blue Chip® and Blue Granular®

**NUTRALENE®**  
An advanced controlled release nitrogen product derived from methylene ureas. This versatile nitrogen source is completely available within one growing season and is released through hydrolysis and microbial mechanisms.

**TURCAM®**  
An insecticide used by professional applicators to control a wide variety of pests including white grubs, chinch bugs, gypsy moths, webworms and bronze birch borers. Also available in a granular formulation.

**PROGRASS® EC**  
Selective herbicide used to control *Poa annua* and broadleaf weeds in fine turfs such as fairway height bentgrass, ryegrass, bluegrass and dormant bermudagrass.

**BANOL®**  
Completely water-miscible fungicide concentrate applied to turf grasses subject to Pythium Blight; it also prevents several fungal diseases that attack ornamentals.

**PROXOL® 80SP**  
Fast-acting insecticide controls most species of white grubs as well as many surface pests in fine turf areas.

**NOR-AM**  
NOR-AM CHEMICAL COMPANY  
Specialty Products Division  
A Schering Berlin Company  
3509 Silverside Road, P.O. Box 7495  
Wilmington, DE 19803

**IMPORTANT:** Please remember always to read and follow carefully all label directions when applying any chemical. Copyright ©1992 NOR-AM Chemical Company. All rights reserved.



## Specializing in Golf Course Renovations

- Tees • Greens • Traps • Fairways
- Hydroseeding • Plant Installation •

**don fiore** company, inc.

landscape contractors & architects  
golf course contractors

28846 Nagel Court  
Lake Bluff, Illinois 60044  
708-234-0020  
Fax 708-234-0922

Certified Member: American Society of Landscape Architects  
Midwest Association of Golf Course Superintendents



# FULL SERVICE GROUND WATER SPECIALISTS



## Meadow Equipment Sales & Service, Inc.

Well Drilling Contractors / Pump Service  
27 W. 021 St. Charles Road  
Carol Stream, IL 60188

- Water Well Drilling
- Pump Sales and Service
- Water Well Sealing & Capping
- Complete Waterwell Systems
- Large Selection of Pumps  
Line Shaft / Submersible
- Well Rehab & Chlorinations
- Maintenance Programs
- 24 Hour Emergency Service

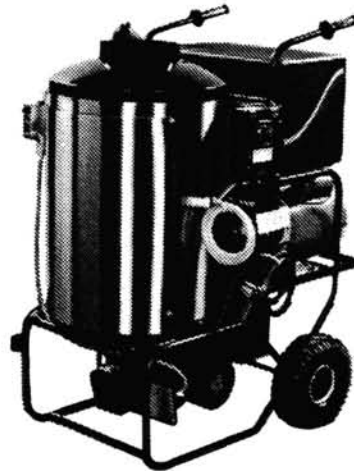


**Authorized Sales and Service for  
Leading Pump Manufacturers**

WHEATON: (708) 231-6250  
ST. CHARLES: (708) 584-6210  
BENSENVILLE: (708) 766-1906

*"Where Meadow Goes,  
the Water Flows"*

# PRESSURE WASHERS



250  
to  
2,000  
PSI

## NEW AND USED

### FREE DEMO

- SALES
- SERVICE
- PARTS
- CHEMICALS

## CALL TOLL FREE 1-800-666-3900

*"The Cleaning Equipment Specialists Since 1976"*



**TIM LAYDEN**  
General Manager

708-893-0777 • FAX (708) 893-1045

1-800-666-3900  
Sales Service Parts Rentals Chemicals  
25 S. Park Street • Roselle, Illinois 60172

# U.S. Course Construction Continues Upward Climb

*358 New Courses Added to National Supply ... All Systems Go For a Repeat Performance in '94*

The National Golf Foundation's final tally of golf course superintendent in the U.S. for 1993 shows that a 23-year high of 358 new courses opened for business last year.

This marks the fourth straight year that new course openings have increased in the U.S. It also brings the number that have come on line over the past five years to 1,642 .. or about 328 per year. The previous five-year high was 1,625; established during the 1971-75 time period.

Looking ahead, NGF researchers see evidence of an equally good year in 1994. In addition to the top line numbers, the report offers other insights into the health and vitality of the game. Among them:

**Public golf remains the predominant focus.**

Eighty percent of those courses that came on line last year were public, i.e., they were either daily fee or municipal operations.

The likelihood of this situation continuing for a while is reflected in the fact that about 80% of those courses under construction and in planning today are also public.

*[A review of past reports shows that, over the past 20 years, the number of public facilities in the U.S. has increased by 61%. Private facilities, on the other hand, have actually declined by 1%. The bottom line: 66% of the nation's golf facilities are public and there's nothing to indicate this percentage won't go even higher in years to come.]*

**Existing facilities continue to expand.**

Nearly one-third (31%) of all the new courses in 1993 were

additions to existing facilities ... an indication that many operators are not only experiencing increased demand, but also moving to meet it.

Seventy-five percent of this activity is occurring at daily fee and municipal courses and 85% of the projects are nine-hole additions.

Looking at the state leaders for 1993, Florida once again led the way with 37 openings; followed by Illinois and Michigan with 26 and 22 respectively.

Michigan sits atop the "under construction" scoreboard with 59; followed by Pennsylvania and Illinois with 39 and 28 respectively. Florida remains among the top 10 with 25.

Top 15 States			
1993 Openings		Under Construction (as of Dec. 31, 1993)	
Florida	37	Michigan	59
Illinois	26	Pennsylvania	39
Michigan	22	Illinois	38
Ohio	17	Wisconsin	35
Alabama	16	Missouri	29
Texas	16	Texas	27
California	14	Ohio	26
New York	14	Florida	25
Wisconsin	13	Indiana	25
North Carolina	12	New York	25
Virginia	12	Minnesota	24
Georgia	11	California	22
Kentucky	11	North Carolina	20
Indiana	10	Oregon	20
Washington	10	Georgia	18

Source: National Golf Foundation



Since 1930

### A Tradition

*More than 60 years of complete, dependable and economical tree service.*

# Nels J. Johnson Tree Experts, Inc.

Nels J. Johnson, Jr.  
President

Karl G. Johnson  
Vice President

Fully Insured

Main Office: 912 Pitner Avenue, Evanston, IL 60202

Telephone: (708) 475-1877

Fax: (708) 475-0037

From tee to green and everything  
in between,  
nothing controls  
turf diseases like  
Chipco® 26019.



**RHONE POULENC AG COMPANY**  
P.O. Box 12014, 2 T. W. Alexander Drive  
Research Triangle Park, NC 27709  
919/549-2000



**Construction Services to the Golf Industry**

*Your source for Golf Course Construction, Reconstruction & Improvement.*

*You have the Projects, Ideas & Needs. We have the Experience & Equipment to do the job **Right the First time.***

*Many Trucks  
Equipped with  
High Floatation  
Tires to  
Minimize  
Damage to your  
Golf Course*



- New Construction
- Remodelling
- Irrigation
- Drainage
- Feature Shaping
- Trap Sand Replacement

- Water Control Structures
- Pond Cleaning
- New Ponds
- Pond Lining
- Cart Paths



*Specialized  
Equipment  
suited to  
Cleaning your  
existing Golf  
Course  
Water  
Features.*

**CALL US TODAY!!**

**Lee Bruce**

**(608) 836-7041**

**Carl Dowse**

*Established 1953*

Total U.S. Golf Course Supply / 1993

1994 Dallas Convention - Foreign Country Attendance

STATE	DAILY FEE*		MUNICIPAL		PRIVATE		TOTAL	
	Number	Rank	Number	Rank	Number	Rank	Number	Rank
Alabama	87	23	32	29	114	T-17	243	24
Alaska	11	46	3	T-47	1	51	15	50
Arkansas	182	16	33	T-27	67	29	282	21
Arizona	82	35	16	T-40	69	T-23	167	32
California	362	6	182	9	305	3	872	2
Colorado	72	39	75	9	52	33	199	25
Connecticut	56	T-33	36	26	80	26	172	30
Delaware	6	50	2	50	21	T-39	29	49
District of Columbia	1	51	3	T-47	2	50	6	51
Florida	516	2	104	5	459	1	1,079	1
Georgia	146	17	45	20	159	9	352	14
Hawaii	86	T-33	8	45	20	T-41	84	T-43
Idaho	46	T-39	28	T-32	14	T-44	88	41
Illinois	279	9	170	2	198	6	647	8
Indiana	244	12	65	11	102	20	412	12
Iowa	196	14	55	13	119	14	370	13
Kansas	75	29	51	15	114	T-17	240	25
Kentucky	114	22	43	23	93	21	250	22
Louisiana	38	42	23	35	89	T-23	150	34
Maine	93	25	9	T-43	18	43	120	35
Maryland	46	T-39	30	21	89	23	165	31
Massachusetts	183	15	40	T-24	120	13	343	15
Michigan	563	1	85	8	147	10	795	T-3
Minnesota	282	11	85	7	72	27	420	11
Mississippi	82	T-35	13	42	90	22	185	33
Missouri	134	19	49	T-17	118	15	301	17
Montana	43	41	20	37	21	T-39	84	T-43
Nebraska	85	T-26	44	T-21	57	32	186	27
Nevada	32	45	21	36	10	T-47	83	45
New Hampshire	83	28	4	46	13	46	100	39
New Jersey	85	T-26	49	T-17	122	12	266	19
New Mexico	33	44	28	T-32	24	T-37	85	42
New York	422	4	125	4	248	4	795	T-3
North Carolina	283	8	33	T-27	183	8	499	9
North Dakota	35	43	46	19	24	T-37	105	38
Ohio	443	3	99	6	194	7	736	6
Oklahoma	80	32	65	12	58	T-30	183	28
Oregon	118	20	17	T-38	38	34	173	29
Pennsylvania	385	5	40	T-24	230	5	655	7
Rhode Island	24	48	3	T-47	20	T-41	47	48
South Carolina	215	13	9	T-43	115	16	339	16
South Dakota	80	37	31	30	38	35	117	36
Tennessee	96	24	44	T-21	105	19	245	23
Texas	274	10	167	3	329	2	770	5
Utah	27	46	50	18	14	T-44	91	40
Vermont	46	38	0	51	10	T-47	58	46
Virginia	117	21	27	34	135	11	279	18
Washington	142	18	54	14	58	T-30	254	20
West Virginia	70	31	17	T-38	29	36	116	37
Wisconsin	299	7	67	10	70	28	436	10
Wyoming	25	47	18	T-40	7	49	42	47
U.S. Totals	7,370		2,363		4,915		14,648	

\*Privately-owned but accessible to the public.

Source: NGF Golf Facilities in the U.S. / 1994 Edition

ARGENTINA	13	JAPAN	169
AUSTRALIA	38	KOREA	14
AUSTRIA	10	LUXEMBOURG	2
BELGIUM	6	MALAYSIA	16
BERMUDA	9	MEXICO	84
BRAZIL	3	NETHERLANDS	40
CANADA	467	NETHERLANDS ANTILLES	1
CAYMAN ISLANDS	2	NEW ZEALAND	6
CHILE	6	NO. IRELAND	3
CHINA	1	NORWAY	6
COLOMBIA	7	PANAMA	2
COSTA RICA	1	PHILIPPINES	7
DENMARK	4	PORTUGAL	18
ECUADOR	1	SAUDI ARABIA	1
FINLAND	5	SINGAPORE	38
FRANCE	10	SOUTH AFRICA	3
GERMANY	48	SPAIN	23
GREAT BRITAIN	100	SWEDEN	21
GREECE	2	SWITZERLAND	23
GUATEMALA	1	TAIWAN	10
HONG KONG	10	THAILAND	19
HUNGARY	1	TURKEY	1
INDONESIA	7	UNITED ARAB EMIRATES	2
IRELAND	16	URUGUAY	1
ISRAEL	2	VENZUELA	9
ITALY	16	WEST INDIES	3
JAMAICA	1		

TOTAL ..... 1309

# Primo®

## For Managing Turfgrass Growth

Primo, by Ciba-Geigy, is a new type plant growth regulator needed in today's environmentally conscious world.

Primo is available in quarts, gallons and the new 10 gallon turfPak.

Primo **WILL** save you money by reducing:

- Labor spent collecting clippings
- Labor in double cutting or raking
- Application times; can be tank mixed
- Disposal fees
- LABOR...Period!

FOR INFORMATION, CALL:

# Arthur Clesen, Inc.

543 Diens Drive • Wheeling, IL 60090 • (708) 537-2177 • FAX (708) 537-2199



Product Profile:

## Jacobsen HR 5111



- 11' 6" cut, three ANTI-SCALP decks
- Counter Rotating, rear discharges - CLEAN cut
- Four wheel drive, ALL WEATHER capabilities
- 11" Trimming left and right
- LIGHT WEIGHT, weighs 1/2 of the 16' rotaries
- PRODUCTIVE, 6.3 acres/hour at 5 mph
- Two year or 1500 hour warranty, BEST in the industry



**illinois lawn equipment, inc.**

16450 South 104th Avenue • Orland Park Illinois 60462

708-349-8484



**Technology Backed By Tradition**

## Midwest Breezes



### Upcoming Events — Mark Your Calendar

- April 7 — ITF Rinsate at Oak Brook Hills Resort  
April 25 — MAGCS Meeting at Inverness C.C.  
May 16 — ITF Golf Day at Silver Lake Golf Club  
June 20 — MAGCS Meeting at Aurora C.C.  
July 11 — MAGCS Meeting at Orchard Valley G.C.  
August 13 — Family Picnic & Kane County Cougar Ball Game  
August 29 — John Deere Team Championship at Naperville C.C.  
September 12 — MAGCS Meeting at Seven Bridges  
September 26 — ITF Golf Day at Ivanhoe Club & Conway Farms  
October 3 — Pro/Superintendent at Glenview Club  
October 10 — MAGCS Meeting at Oak Brook Hills C.C.  
November 28-30 — NCTE at Pheasant Run Resort

All meetings starting in March 1994 will require advance paid registrations.

-----  
Ooops Department: The picture on page 21 of the March issue, should read, "Rick Wilson, Marlene & Dudley Smith". For those of you who may not know, Marlene is Rick Wilson's mother. Also I have been corrected on the proper spelling of some of the names in our group photo from the 1944 Purdue picture from last month. # is Malcolm McLaren, Cleveland, Ohio; #31 is Carl Bretzlaff and #40 is Ward Cornwell. In "Mark Your Calendar" the correct date for the ITF Rinsate Pad meeting is April 7.

-----  
For Sale: Assorted variety of sand trap rakes. Call Tony at Cantigny Golf, 708/668-3323. Best offer.

-----  
Glenn Bereiter at Steeple Chase G.C. is looking for an assistant. Call 708/949-1419.

-----  
Congratulations to Bob Lively on his promotion to Superintendent at Glendale Lakes G.C. Bob was the assistant to his brother Tom at Ruth Lake G.C.

-----  
Brian Green is waging a letter writing campaign to Michigan State concerning them moving their collection of equipment to California. Quite a few of the local superintendents gave the college old equipment and tools, expecting that they would be kept in the Midwest, but the college shipped them west for they say they couldn't keep them up. Brian would like to hear from you. Call 708/433-0850.

Wanted: Jacobsen G-10 tractor or comparable, to pull gang mowers. Call Ron at 815/468-3438 anytime.

-----  
Congratulations to Brian Bossert of Bryn Mawr G.C. on passing and becoming a Certified Superintendent during the Dallas conference.

-----  
Congratulations to Tom Wolff, former assistant at Sunset Ridge to Dennis Wilson, who is the new superintendent at Quail Meadow's G.C. in Peoria, IL.

### 1994 GCSAA Championship Results

Chapter Team (Net):

Midwest AGCS #6

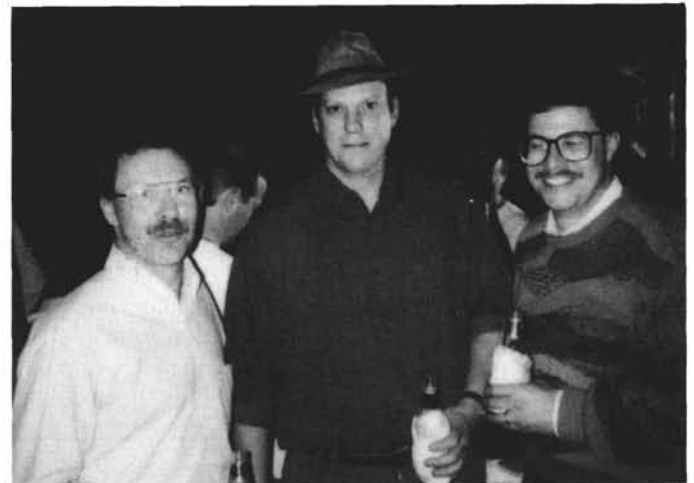
Robert Maibusch, CGCS — Hinsdale GC, Clarendon Hills, IL

Les Rutan — Beverly CC, Chicago, IL

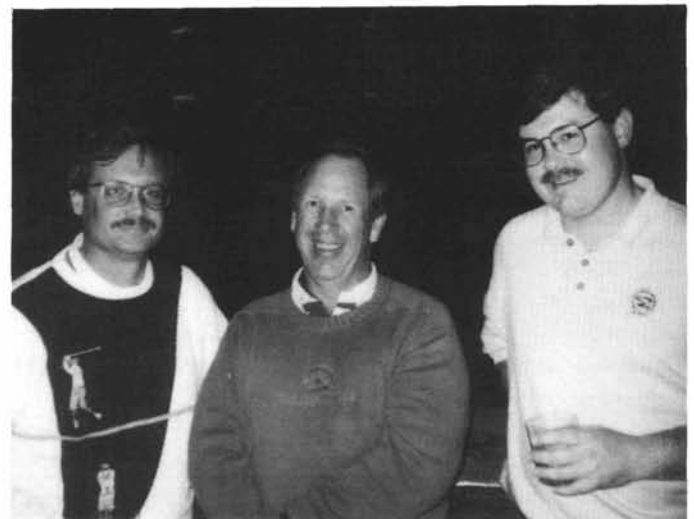
Roger Stewart, Jr., CGCS — Stonebridge CC, Naperville, IL

Bruce R. Williams, CGCS — Bob O'Link G.C., Highland Park, IL

### More photos from Dallas at the MAGCS room



Dave Beno, Gary Hearn & Doug Long



Mike Nass, Bob Kronn & Don Cross

(1964 Bull Sheets continued)

It should also be noted that dinner at the Olympia Fields meeting consisted of sliced sirloin of beef, fruit cup, garden salad, au gratin potatoes and asparagus with a parfait dessert. Cost was \$5.00 per person.

1964 prize winning golfers included this mixture of new and old names. Low Gross Co-Champions at the annual tournament were Emil Mashie and Bill Hargrave. Some of the other prize winners during the year were Emil Cassier, Joe Canale, Art Benson, Sr., Harold Michaels, Dick Richardson, Bill Sialli, Harry Nielsen Jr., Charley Schultz, Gerald Dearie Jr., Wally Pieper, Ed Burke, Pete Voykin, Al Pruess, Art Benson Jr., Ben Kronn, Harold Fredrickson, Joe Dinelli, Alby Staudt, Ron Rossett, Bill Kraft, Charlie Rack, Doug Jabaay, Roy Nelson, Bob Williams, Tony Meyer, John Ebel, Ed Braunsky Sr., Ted Woehrle, Dick Trevarthan, and Ed Wollenberg.

The joint meeting of club managers and superintendents was held September 21st at Midlothian Country Club - Ed Duehr, Host.

At the August 3rd Olympia Fields meeting the Educational Committee presented a question/answer session. The moderator was John Ebel, Barrington Hills; Bob Williams, Bob-O-Link; Roy Nelson, Ravisloe C.C.; Ed Wollenbert, Gary Country Club; and Dr. Klomprens from the Upjohn Company were panelists.

Many subjects were discussed, but the devastating effect that Pythium had on *Poa annua* was foremost. It was suggested that an outside expert be brought in to evaluate all of the maintenance procedures used in the area. It was suggested that that endeavor was too big for one person to handle, particularly with the relatively short time frame that was required. It was then decided that a panel of experts should be formed to discuss this problem.

This panel met at a special meeting which was held at the LaSalle Hotel. Invited were club officials, green chairmen and superintendents. The meeting was held at 3:30 p.m. on August 22nd. The Chicago District Golf Association assisted in this endeavor and this well could have been the first of the Chicago District Golf Association Seminars. A panel was formed consisting of Dr. Mike Britton and Dr. Jack Butler of the University of Illinois; Dr. Bill Daniel, Purdue University; Roy Nelson, Ravisloe Country Club; and Warren Bidwell, Olympia Fields C.C. The moderator was Jim Holmes of the U.S.G.A. Greens Section. Over 200 people were in attendance and the states of Illinois, Wisconsin, Iowa, Indiana and Michigan were represented.

Charles Eckstein, representing the Chicago District Golf Association opened the meeting and turned it over to Jim Holmes. Each panelist made his opening remarks and contributions were made from the floor. *Poa annua*, a hot humid summer, and disease (Pythium) were identified as the major culprits. There was considerable discussion on the merits of several strains of bent and blue grass, disease control, drainage, fertilization, height of cut, and maintenance practices. Air circulation was a major problem as was the non-existence of a fungicide that was really effective on Pythium. No real consensus was reached, but it was felt that the sharing of the problem certainly did help. The speedy scheduling of this meeting clearly shows the concern for this problem that existed in 1964.

This concludes the 1964 **Bull Sheet** review, and the following thoughts are in the form of a commentary: The major accomplishment of this meeting was the formation of a mutual-respect relationship between Chicago District Golf Association and the Midwest Association of Golf Course Superintendents that still exists today. The annual C.D.G.A. Turf Symposium, the former Morton Arboretum Turf Plots, the Clavey Road Effluent Water Project, the test project at Hines Veterans Administration Hospital, and the test green at Cantigny are but

---

*The major accomplishment of this meeting was the formation of a mutual respect relationship between Chicago District Golf Association and the Midwest Association of Golf Course Superintendents that still exists today.*

---

a few examples of projects done jointly by the C.D.G.A. and members of the M.A.G.C.S. Although there is no formal agreement between the two organizations, members of both organizations work together for the betterment of turf.

The C.D.G.A. also funds the efforts of Dr. Randy Kane who, although he did not arrive on the scene until the mid-1980's, represented the expert that the Midwest wanted to hire in 1964.

I would like to acknowledge Ted Woehrle, Bob Williams and Carl Hopphan for both their factual and editorial comments relevant to the above article.

---

## **Gypsy Moth Caterpillar Caution — Do Not Handle!**

by West Virginia University Extension Service

The natural curiosity and delight which children exhibit toward nature should never be discouraged. Touching, holding, and observing plants and animals are valuable learning experiences. However, there are a few plants like poison ivy, and animals like gypsy moth caterpillars, which are better left alone.

Contact with the gypsy moth caterpillar may cause an allergic reaction in some people. Those who are sensitive may develop a skin rash, which scientists believe is caused by a histamine, or histamine-like substance released from the hairs on the caterpillars. The reactions are minor and will go away, but the itchy discomfort which accompanies each is not pleasant.

The results of a study in Massachusetts that children are more susceptible than adults. In this study twenty percent of the children ages 0-12 developed a skin reaction. Only about 10 percent of the adults, ages 13-59 developed a reaction.

The mature gypsy moth caterpillar can be distinguished by its very hairy appearance and the double row of spots down its back. The first five pairs of spots are royal blue, and the remaining six pairs are bright red. Its overall color is charcoal or gray. The caterpillars appear from late April through June.

The gypsy moth is a non-native forest insect pest. It was introduced into Massachusetts in 1869. It has a complex and interesting life cycle, as well as a ravenous appetite for the leaves of over 500 species of trees and shrubs.

Your county health department should be able to provide information on how to identify and treat a suspected allergic reaction to the gypsy moth caterpillars.

**Credit: Greenletter 10/91**



## Work from the soil up with Nature Safe®.

- Homogeneous
- Non-Burning
- Micro-Nutrient Rich

Creating a soil  
structure  
to grow turf.

**Nature  
Safe®**

Natural & Organic Fertilizers

(800)252-4727

(606)572-2549



Also available in  
10-3-3 and 7-1-14



**SERVICE!**

ON TIME. EVERYTIME

**QUALITY!**

5-WAY BLEND OF ELITE KENTUCKY  
BLUEGRASSES. GROWN ON MINERAL SOIL.  
NO SOD HARVESTED BEFORE 18 MONTHS.

**PRICE!**

TOP OF THE LINE SERVICE AND QUALITY AND A  
TERRIFIC BOTTOM LINE. CALL FOR A QUOTE.

708-557-2900

46W340 Main St.  
Kaneville, IL 60144  
ON MAIN ST., 11 MILES  
WEST OF BATAVIA



**TeeTime**

**18-6-5  
Fertilizer  
with Dimension®**

the professional's  
partner

**The  
Andersons**

**TeeTime**

**10-5-25  
Fertilizer  
with Dimension®**

the professional's  
partner

**The  
Andersons**

**TeeTime**

**24-4-12  
Fertilizer  
with Dimension®**

the professional's  
partner

**The  
Andersons**

**The  
Andersons**

# The Tough Just Got Tougher.

**D**IMENSION, the toughest thing since crabgrass, is one of the industry's most exciting, most talked about weed control products to ever come along. Incorporated with one of The Andersons' proven Tee Time fertilizers you can count on superior, double-duty performance in a single, effective application.

Find out more today,  
contact your Tee Time  
technical representative:  
Brett Rush 708-654-3142

# Rolling Greens — Help Or Hinderance? — Preliminary Report

by Karl Danneberger, Edward McCoy & Thomas Parobek  
Dept. of Agronomy, The Ohio State University

## Introduction

Rolling putting greens to enhance green speed has been practiced for a number of years. In the past however, rolling with heavy rollers had lost favor due to soil compaction problems (1). With the introduction of more technology advanced lighter rollers, interest in rolling greens — especially sand based greens — has increased (2).

Pressure to increase green speed is often associated with a golf tournament, or a special club function. Rolling may serve as a means of enhancing speed during these times. The purpose of this study was to evaluate the effect of rolling on green speed, water infiltration, and turf quality over a short period of time.

## Methods and Materials

A short-term rolling study was initiated on May 28, 1993 and continued through June 15, 1993 at the Ohio State University Turfgrass Research Center, Columbus, Ohio. Two locations with different green construction methods were used in the rolling study. The first site was a 21-year-old USGA constructed green seeded to "Penn-cross" creeping bentgrass (*Agrostis palustris* Huds). (3). The second site was a 10-year-old "Penn-cross" creeping bentgrass turf established on a Brookston silty-clay loam. Both sites were mowed at 5/32 of an inch with a John Deere Walk Behind mower preceding the rolling treatments. Irrigation was applied between 1400 and 1700 hours when needed. Treatments consisted of a single day rolling with a Toro Greensmaster 3000 with rolling units and a non-rolled control. Each plot measured 5 feet by 19 feet and each treatment was replicated three times.

Green speed was determined by using a stimpeter. Stimpeter measurements were made immediately after mowing but preceding the rolling treatment and then again immediately following the rolling treatment. A total of four stimpeter readings (two readings each from opposite directions) were taken from each plot. The rolling treatment and stimpeter measurements were conducted between 1100 and 1400 hours. A total of 7 stimpeter readings were made over a 13 day period (May 25 - June 9, 1993).

Two water infiltration measurements per plot were made on June 15, 1993 with a Infiltrometer (Turf-Tec International, Miami, Florida). In addition, visual quality ratings were made at this time. Treatment effects were statistically analyzed on a one-way ANOVA (MSTAT, Michigan State University, East Lansing, MI).

## Results and Discussion

Stimpeter readings during the duration of the study varied from 7 feet 0 inches to 9 feet 6 inches on both the USGA and native soil greens. As measured by the stimpeter, rolling increased green speed significantly on both the USGA and native soil greens compared to the non-rolled control (Figure 1 and 2). On the USGA sand green, rolling increased green speed between 5 and 11 inches compared to the non-rolled plots. As the duration of the study increased a general increase in putting green speed was observed.

## ROLLING - EFFECT ON GREEN SPEED Rolled vs. Control (after rolling)

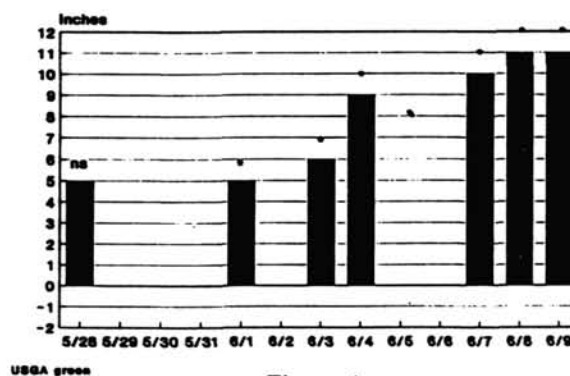


Figure 1

Effect of rolling on a USGA putting green over a 13-day period. The 0 base line represents the control. Positive numbers infers the increased speed in inches of the rolling treatment over the control. ns = not significant, \* = significant at the P=0.05 level.

## ROLLING - EFFECT ON GREEN SPEED Rolled vs. Control (after rolling)

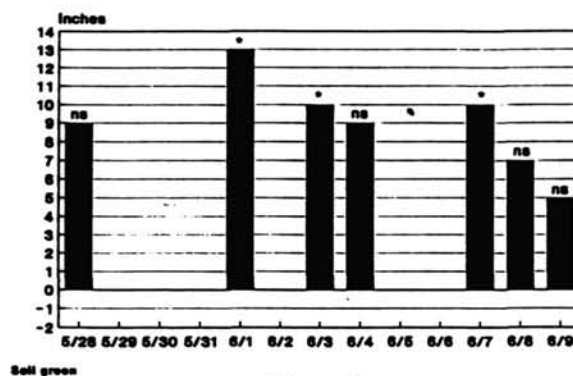


Figure 2

Effect of rolling on a native soil green over a 13-day period. The 0 base line represents the control. Positive numbers infers the increased speed in inches of the rolling treatment over the control. ns = not significant, \* = significant at the P=0.05 level.

On the native soil green speed was greater for the rolled treatment than the non-rolled control with green speed increasing between 5 and 13 inches. However, on the native soil green the number of significant (P=0.05) stimpeter readings were less (3 out of 7 for the native soil versus 6 out of 7 for the USGA green). Increasing green speed with successive rollings were not observed on the soil green. Considerable variation in weather might have accounted for some of the variation. During the 13-day period, stimpeter readings were madw when the weather varied from cloudy and cool with rain to hazy hot and humid.

Comparison of stimpeter readings of the rolled plots versus the control plots immediately preceding the rolling treatment revealed no difference in green speed on both the USGA and native soil greens (Figure 3 and 4). From these data it appears that rolling increases green speed but the effect is short lived (less than 24 hours).

Rolling had no effect on water infiltration rate over the duration of this study. Rolling did negatively affect the overall visual quality of the turf. The rolled pltos were more off-color and showed some wear.

(continued page 22)