THE BULL SHEET, official publication of the MIDWEST ASSOCIATION OF GOLF COURSE SUPERINTENDENTS.

1988 Board of Directors

President	Mike Nass (Jean) Cantigny Links	Home: 462-1547 Office: 668-3730
Vice-Pres.	Dave Meyer (Penny) Indian Lakes C.C.	Home: 820-1040 Office: 529-0200
2nd Vice Pres.	Bruce Williams (Roxane) Bob O'Link G.C.	Home: 680-1074 Office: 432-0088
Sect'y.-Treas.	Roger Stewart (Sue) Riverside G.C.	Home: 961-2803 Office: 447-1049
Exec. Sec.	Penny Meyer (Dave) MAGCS (Mailing Address) P. O. Box 248, Eola, IL 60519	Office: 820-8181
Board	Alan Fierst Oak Park C.C.	Home: 456-7815 Office: 453-7525
	David E. Louttit Innsbrook C.C.	Home: 219-663-3830 Office: 219-980-3107
	Joel Purpur (Debbie) River Forest C.C.	Home: 953-8410 Office: 941-1651
	Ray Schmitz (Jan) Flossmoor C.C.	Home: 815-469-2773 Office: 798-2498
	Dennis Wilson (Pat) Sunset Ridge C.C.	Home: 441-8387 Office: 446-5222
Pres. Emeritus	Jim Evans (Debby)	Home: 815-455-3994 Office: 815-459-8570

Official Photographer Raymond Schmitz

Dr. Randy T. Kane, Turfgrass Advisor (312) 954-2753
University of Illinois & CDGA

ECKHOFF AWARD
For Excellence In Golf Journalism

NGF™
NATIONAL GOLF FOUNDATION

Editor —
Fred D. Opperman, CGCS
1022 Shady Lane
Glen Ellyn, IL 60137
Phone (312) 469-3444

Bull Sheet printed by Ever-Redi Printing, 5100 East Ave., Countryside, IL 60525.

The **Bull Sheet** is published once a month. All articles are required by the 10th of the month to make the next issue. Advertising is sold by the column inch, by the quarter page, half page, and by the full page. All artwork to be finished and in black and white. Circulation is over 570 issues per month.

President's Message
By Mike Nass, CGCS

As the 1988 season comes mercifully to an end, it is time to try to pull something positive out of what was obviously one of the worst seasons, weather wise, in many years.

The first thing that comes to mind is the excellent opportunity to sell your club on a new or an upgraded irrigation system. A tour of the course with the appropriate club officials should make it relatively easy to pinpoint weak areas in your present system. After that it is then up to you to put together a proposal that can't be refused.

Last year's rains followed by this year's drought could lead to the ground sinking around old or damaged tile lines. These then could be dug up and repairs made, possibly averting a problem in the future.

By now you all should have a real good idea how much stress your turf can take without drastic losses. This could help you in the future to manage your irrigation in a more efficient manner. At the same time you've probably seen a significant drop in your Poa population which may lead to further savings in irrigation usage.

These are just a few things that pop into my addled, burned out mind. I'm sure most of you are capable of coming up with your own list of positives. The important thing is that you always stress the positives. This is particularly important when talking with your green chairman or club members. Even when you may be some what discouraged don't let any one know it. If people sense discouragement they may begin to lose confidence in your ability and that can only lead to trouble.

On another note please remember that November 2 is the date for our annual Midwest Clinic, this year at Medinah. It was decided to go back to the more traditional form of clinic, held separately from the NCTE and utilizing our own members more as speakers. I hope this will be well attended as it will also be the date of our annual election.

One final positive note, I only have one more president's message to write so you don't have much longer to wait for the end of my monthly ramblings.

Recommendations for Minimizing Drift When Spraying Turfgrass

Dr. Stephen Pearson & Thomas Reed
Spraying Systems Co.

Off-target pesticides are environmental pollutants and each time you spray turf areas with pesticides there is a chance they will drift, especially during windy weather. Along with environmental concerns, drift is a major concern because of wasted chemical and reduced pesticide control. Generally for applicators spraying turfgrass, the close proximity of susceptible vegetation, wildlife and water supplies makes it even more important to follow proper drift control techniques.

The primary way to control drift is to read the pesticide label. Instructions on the label are given to ensure the safe and effective use of pesticides with minimal risk to the environment. Surveys indicate that approximately 67% of the drift complaints involved application procedures known to be "off-label."

There are two ways that pesticides move downwind to cause damage: droplet drift and vapor drift. Vapor drift is the result of the volatilization of pestcide molecules, making vapor drift independent of the application. Most investigations show that the distances that vapor can travel are much greater than the distances traveled by droplet drift of nonvolatile pesticides. Because the volatilities of pesticides are generally known, appropriate formulations can generally be used. In the turf area it is a common practice to use low-volatile formulations of 2,4-D herbicides.

Droplet drift is the off-target movement of spray droplets formed during application. Droplet drift is affected by a number of equipment and environmental factors. To understand this type of drift it is necessary to be familiar with spray droplet measurements. Droplet diameters are measured in microns (1 micron = 1 millionth of a meter), which as you can imagine, is a very small increment. Droplets of less than 100 microns are difficult to see with the naked eye. Droplets of 50 microns or less will evaporate rapidly and move readily with vertical and horizontal air motion. Depending on local weather conditions, these droplets can be displaced for considerable distances, but their movement is difficult to predict. Larger droplets of 100 to 200 microns in diameter that move off-target remain airborne for less than 30 seconds and usually deposit down wind in less than 30 feet.

Techniques used when applying pesticides to turf greatly determine the amount of spray drift potential. The type of nozzle, pressure, nozzle height and spray volume all affect the amount of off-target movement. Of the many nozzle types available for applying pestcides, the following are specifically designed for reducing drift.

1. **Extended Range Flat Spray Tip (XR)**: Provides excellent drift control when operated in a pressure range of 15 to 25 psi. This nozzle would be ideal for an applicator who likes the uniform distribution of a Flat Fan type nozzle, and wants the advantage of lower operating pressures for drift control.
2. **Fulljet Wide Angle Full Cone Spray Tip (FL)**: Provides excellent drift control when operated in a pressure range of 15 to 25 psi. This nozzle is ideal for the operator who may be currently using a wide angle hollow cone nozzle, and wants the distribution uniformity advantage of a Full Cone type nozzle.
3. **Floodjet Wide Angle Flat Spray Tip (TK)**: Provides excellent drift control when operated in a pressure range of 10 to 25 psi. This Flat Fan type nozzle requires a minimum of 100% overlap to maintain a uniform distribution. The 100% overlap minimizes the chance of skips or untreated areas due to undulating terrain or boom fluctuations.

For effective drift control, nozzles should be used at low pressures. Low boom heights are also an advantage so long as you don't sacrifice swath uniformity. The closer the boom or nozzle is kept to the turf the less chance for drift. Correct spray heights for each nozzle type is determined by nozzle spacing and spray angle.

Spray volume is also a means of decreasing drift potential. Increasing the spray volume results in larger droplets that are less likely to move off-target. To increase the spray volume, increase the nozzle size. The larger the nozzle orifice the larger the droplets. In windy conditions, increasing water carrier volumes from a normal 1 or 2 gallon/1000 ft_2 to 3 or 4 gallons/1000 ft_2 by using larger nozzles will reduce the potential for off-target drift.

Meterological factors that affect drift include wind velocity and direction, temperature, relative humidity and atmospheric stability. Though wind velocity is the most critical weeather related factor causing drift, good application techniques can minimize its effects. A turf application made in a 1 or 2 MPH breeze in which a large number of fine droplets are aplied may result in more drift than an application made in a 10 MPH wind utilizing good drift control procedures.

Wind direction relative to surrounding vegetation is also important in minimizing damage from drift. Applicators often overlook the presence of sensitive vegetation adjacent and downwind of the spraying operation. If possible leave a buffer zone next to the sensitive plants. Spray sensitive areas after the wind velocity decreases.

Downwind drift can be reduced from 50 to 80 percent with the use of spray thickening agents. There are a number of products available as thickening agents, but remember to follow the directions carefully. Incorrect concentrations or mixing proceudres can lead to poor distribution patterns and low flow rates. These additives do not eliminate drift, however, with careful use can be effective in reducing drift.

SUMMARY OF RECOMMENDATIONS TO REDUCE DRIFT WHEN SPRAYING TURFGRASS

Recommendation	Example	Explanation
Select nozzle type that produces course droplets.	XR Flat Fan, FullJet and FloodJet.	Use as large droplets as practical to provide the necessary coverage.
Use the lower end of recommended pressure range.	Use less than 25 psi for nozzles mentioned.	Higher pressures generate many more small droplets.
Use as low as possible boom height.	Keep nozzles as close to the turf as possible without sacrificing uniformity.	Wind velocity effects increase with higher booms. Even a few inches lower can reduce drift.
Increase the spray volumes.	If the normal carrier rate is 1 gal/1000 ft^2 increase to 2 or 3 gal/1000 ft^2	Large capacity nozzles will generate larger size droplets.
Spray when wind speeds are low and wind direction is away from sensitive plants.	Leave a buffer zone if sensitive plants are downwind. Spray buffer when wind conditions permit.	More driftable droplets will move off-target if wind speeds are high.
Use drift control agents.	Commercially available spray thickeners.	Thickeners increase the average droplet size in a nozzle droplet spectrum.

GCSAA Seminars at Pheasant Run St. Charles, IL

The Biology of Turfgrass Soils
January 3, 1989

Dr. Eliot Roberts, Executive Director of The Lawn Institute, reviews the principles of soil microbiology, describes the favorable and unfavorable functions of micro- and macro-organisms and discusses common practices that promote or restrict desirable soil biological activity, all as they relate to turfgrass management. Technical information on the safe use of pesticides to enhance soil biological processes will provide a tool for public relations in the current controversy regarding chemical usage.

Golf Course Safety, Security and Risk Management
January 4, 1989

Dr. Michael J. Hurdzan, noted golf course architect, presents risk management techniques, including the identification of hazards to golfers and non-golfers, the potential for accidents and types of negligence and liability. Safety procedures to minimize risk will be described and adequate and appropriate insurance coverage discussed. This course is designed not to provide legal advice but to expose superintendents to potentia litigious situations as encountered in the personal experience of a golf course architect.

Co-hosts:
Midwest Association of Golf Course Superintendents
Golf Course Superintendents Association of America

One Continuing Education Unit (CEU) is attached to **each** one-day seminar. Luncheons are included in registration fees as are take-home reference materials. A certificate of achievement will be awarded to participants who successfully complete the seminar(s) by passing the examination at the conclusion of the program.

Pheasant Run Resort is the Midwest's largest — and among the finest — resort facility. Located on 200 acres in the Fox River Valley, 40 miles west of Chicago, it is famous for its extraordinary range of year 'round activities and top name entertainment. Seminar participants registering by December 3, 1988, are guaranteed a $65 rate (single or double). Overnight reservations are the responsibility of the seminar registrant.

REGISTER NOW!!!
GCSAA Regional Seminars
1617 St. Andrews Drive
Lawrence, KS 66044
Telephone Registrations by Credit Card are Welcome!
Call 1-800-472-7878

In the year 1775 Alexander Cumming, an English inventer, patented a flush mechanism for toilets and exactly 100 years later Thomas Crapper perfected the flush toilet.

Charles E. (Scotty) Stewart, P.E.

Differential Sensitivity of Turfgrass Organs to Water Stress

J. L. Nus and C. F. Hodges
HortScience, Volume 21, Number 4
Pages 1014-1015, 1986

The effect of environmental stress on the growth and physiology of grasses adapted to turf is gradually becoming recognized as a major factor in their culture. The recovery by Kentucky bluegrass from heavy use and production of both tillers (intravaginal branches) and rhizomes (extravaginal branches) has made it the most widely used cool-season species adapted to turf culture. The production of tillers and rhizomes, however, by cool-season perennial grasses is minimal during periods of water stress, and their recuperative and sod-forming characteristics are diminished.

Overall plant growth is sensitive to water stress and has been proposed as a measure of plant tolerance to water stress. Also, the various organs of a plant may differ in their sensitivity to water stress. The concept of relative growth may be useful for comparing differences among plant organs.

Water stress often increases root:shoot ratios and the increase usually is related to a decrease in shoot growth. The vegetative shoot of Kentucky bluegrass includes all organs except roots: i.e., leaves, crowns, tillers and rhizomes.

Research at Iowa State University was initiated with Merion Kentucky bluegrass to determine the effect of water stress on lateral bud (axillary) development into tillers and rhizomes and to determine the relative growth of the various organs of the plant.

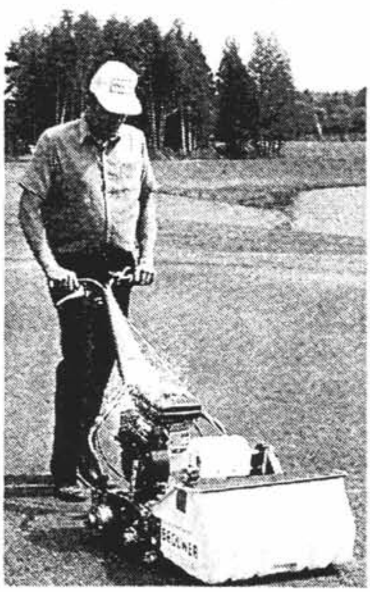
Results are reported as follows:

- Lateral bud meristems (axillary) were most sensitive to increases in osmotic pressure.
- The decrease in lateral bud development subsequently resulted in a decrease in tiller and rhizome numbers.
- Relative growth rates of various organs of Kentucky bluegrass further established that shoot dry-matter loss in response to water stress was due primarily to decreased tiller and rhizome growth.
- The effect of increasing osmotic pressure had relatively similar and less severe effects on leaf and root growth.
- Increase in root:shoot ratio of water stressed Kentucky bluegrass is due primarily to a decrease in relative growth of tillers and rhizomes.

"Oktoberfest Time"

Oktoberfest! You make Our Day,
  Goodbye Drought and Hot Summer Play.
Welcome Fest, cool beer and relaxation,
  While Hot Summer's on It's vacation.
Surprising! what Man and Plant can survive,
  Super-stress and Toasted alive.
Superintendent's and Super-turf,
  Have done the Golf Course Proud,
They've Earned much Praise!
  And I would like to Shout it Loud.

Kenneth R. Zanzig



Pesticides and Protecting Clothing

by Marjorie A. Sohn, Associate professor, University of Ill. at Urbana-Champaign

Exposing your skin to some pesticides presents a health hazard and clothing provides a vital protective barrier against the exposure.

Pesticide applicators can purchase chemical-resistant apparel, but recent surveys indicate the majority of pesticide users wear traditional work clothing when mixing, handling, and applying pesticides. They prefer ordinary work clothing because it is more comfortable, less expensive and easily available. They also doubt the need for protective clothing.

A non-punchtured-type Tyvek is one of the disposable chemical-resistant garments on the market. It is made from spun-bonded olefin, a non-woven fabric that provides an effective barrier to many types of chemicals. Although you usually must dispose of non-woven garments after one use, Tyvek garments withstand up to four launderings. However, if your clothing is contaminated with a concentrated chemical, dispose of it rather than trying to clean it because of safety considerations.

Fabric studies

Testing is under way on Gore-Tex fabric to determine its ability to provide protection from pesticides. Gore-Tex is a microporous membrane that is laminated between a shell fabric and a fabric lining. As a result, Gore-Tex allows perspiration to pass through the fabric, but it keeps liquid from entering the outside of the garment and contacting the skin.

A North Central Region research project focused on the influence of the following characteristics in creating a protective barrier:

- Fiber content,
- Fabric construction,
- Functional finishes, and
- Laundering methods.

Choosing clothing

Absorbency and wicking are important considerations in determining chemical resistance. Tests conducted on cotton, polyester/cotton blends, polyester, nylon, acrylic and spun-bonded olefin fabrics yielded these results:

- Pure cotton fabric exhibits the highest rate of absorbency, which means it absorbs a large amount of pesticide solution. However, less pesticide solution travels to under-clothing or skin.
- Cotton/polyester blends exhibited moderate absorbency and wicking.
- Lightweight fabric (broadcloth) demonstrated lower absorbency than poplin or twill in tests, but it also exhibited very rapid wicking. Broadcloth's tight weave appears to transport pesticide solution more rapidly and in greater quantities to under-clothing or skin.
- Synthetic fiber — acrylic, nylon and polyester — had low absorbency, but they had the highest wicking levels. Compared to other fabrics, the pesticide solution flowed rapidly from the garment to underclothing or skin.
- Spunbonded olefin fabric showed the lowest rate of absorbency and wicking of the fabrics tested. It provides an excellent barrier against pesticide penetration and it offers extra protection when you wear it over work clothes.
- Clothing with a consumer-applied flourocarbon soil-repellent finish give the same protection as spun-bonded olefin, but it is more comfortable to wear.

Balmoral Woods Golf Club
Photos by Ray Schmitz

Dr. Dave Wehner explaining his sabbatical leave from U of I

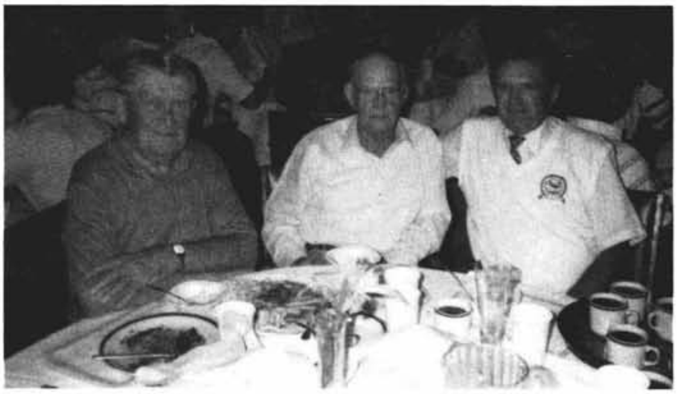
Owner Don Mortell and Superintendent Bob Morrell

Host Bob Morrell receiving a plaque from President Nass

Bill & Ed Fischer

Dave & Tony Meyer

Trent Bradford, Don Ferrari, Rick Wilson and Bob Padulla



Bob Miller, Ben Coker & Bill Kraft