NORTHWEST TURFGRASS TOPICS

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44th Annual Conference Exhibitor Invitation

Invitations have gone out to some 5-6 hundred companies inviting them to participate in the **1990 Northwest Turfgrass Conference Exhibition** sponsored by the Northwest Turfgrass Association being held Monday, September 17, 1990 at the Rippling River Resort in Welches, Oregon. We are anticipating a turnout of between 300-400 professionals interested in the latest research technology, equipment and products for maintenance of golf courses, parks, grounds and lawns. We have reserved the Rippling River Conference Center, a 7,000 square foot, beautifully refurbished, carpeted exhibit space with room for around 50 table-top exhibitor spaces.

The format for this year's exhibition has been changed from that of years past. This year, exhibitors will not have the traditional draped booths. Instead, they will have 8' draped tables spread around the exhibition area which will have at the center of the space a beautiful heavy hor d'oeuvres setting. Also in the hall will be no-host bars serving alcoholic and nonalcoholic beverages. The intent of this new format is to create a warm, casual, comfortable atmosphere for registrants and exhibitors to meet and get acquainted with one another.

Any potential exhibitor that has not already received an invitation to exhibit and sign-up for should contact the NTA Office (206) 754-0827 for the materials.

1990 Membership Certificates

Membership certificates for 1990 were mailed recently with the annual directories. Members that should have received certificates include: regular, student and honorary members. if you did not receive a certificate and think you should have, contact the NTA Office.

1990/91 Membership Directories

The **Directory of the Northwest Turfgrass Association for 1990/91** has been published and distributed to the members of the association. This year's directory has a much different look than the one last year.

Efforts have been made to ensure that all information in the directory is accurate; however, some mistakes have undoubtedly been made. Please check your own listing for accuracy and let us know if there are any corrections necessary.

We want to thank the suppliers that chose to advertise in this year's directory. They made it possible to provide this service to the members.

Board Director Nominations

The Nominations Committee, chaired by Past President Mike Kingsley, has selected a slate of nominees for the three board director vacancies that are to be voted upon at the Annual Membership Meeting to be held during the conference at Rippling River.

Further nominations for the vacancies will be accepted from the "floor" during the Annual Membership Meeting.

Two of the director positions have terms of 3 years and one position has 1 year left on an unexpired term.

The nominating committee nominees are as follows:

Larry Farwell – Position B-1 (term 9/90 – 9/93)
Superintendent
(Wenatchee Golf & Country Club)

Rebecca R. Michels, – Position B-2 (term 9/90 – 9/93)
President
(Messmer's Landscaping Service, Inc.)

Jon Hooper, – Position C-1 (term 9/88 – 9/91)
Grounds Manager
(University of Washington)

Annual Conference Registration Materials Have been Mailed

All the facilities are reserved; speakers are scheduled; the exhibitor sign-up is going great; the tour busses are chartered; the menus selected; the registrations and housing reservations are beginning to roll in; and all those other details that go into the planning and execution of a conference like the **NTA 44th Annual Northwest Turfgrass Conference and Exhibition** are being completed.

Registration materials for the conference scheduled for September 17-20, 1990 at Rippling River Resort in Welches, Oregon have been mailed to all members. For those planning on attending, the registration form as well as special events forms, should be completed and returned to the NTA Office as soon as possible.

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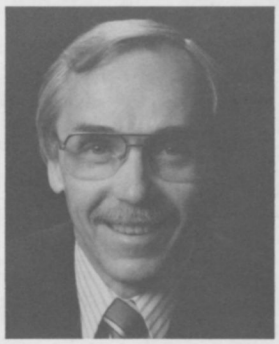
President's Corner

by Dr. William J. Johnston



William J. Johnston

The 2nd annual NTA Turfgrass Summerfest held June 25–26 was an outstanding event. The organization, promotion, and sponsoring of the Summerfest is another example of the expanding list of benefits and opportunities for participation available to you through NTA membership. If you missed the event this year, plan on making it next year. It is worth your time and effort and the proceeds are used to support turfgrass research and scholarship in the Pacific Northwest. This year's Summerfest generated over $6,000 for the research and scholarship fund.

The Summerfest opened Monday with the R.L. Goss Turfgrass Research Golf Tournament at Canterwood Golf and Country Club. We only played 18 holes but with a course rating of 72.5 and a slope of 135 it seemed like 27. The golf tournament was followed by an excellent lunch at the clubhouse. A special thanks goes to the management at Canterwood for the use of their facilities, Superintendent Mark Cupit, Pro Doug Gullickson, and NTA board member Don Hellstrom who"s hard work made the tournament so successful. Thanks also to the 110 NTA members and guests who participated.

Tuesday of the Summerfest began with the WSU Puyallup Turfgrass Field Day. Dr. Stan Brauen showed the overflowing group of 250-300 plus participants the latest in turfgrass research being conducted at Farm 5. This research included water requirements of turfgrass species, influence of antitranspirants on turfgrass water use, growth regulator influences on annual bluegrass seedhead development, evaluations of herbicides and plant growth regulators, nutritional studies on sand profiles, shatter core aerification, and persistence of athletic turf under simulated wear and deficit irrigation. Dr. Gwen Stahnke discussed her work with pesticide movement in soils and Dr. Gary Chastagner's group showed their latest research on Necrotic Ring Spot disease. The field day publication put out by Stan and Gwen is worth the trip to Puyallup. Thank you Stan, Gwen, and your crew for the excellent field day.

At noon the Summerfest moved to the High Cedars Golf Club for the barbecue and large equipment and irrigation show. Wally Staatz, owner of the High Cedars Golf Club, provided the staff for the barbecue and donated the use of the driving range area for the equipment and irrigation show. NTA board member Pat Nibler organized the show and the increase in exhibitors from 6 to 17 speaks well of his hard work and your participation at the show.

With the Summerfest behind us it is time to think about the 44th Northwest Turfgrass Conference and Exhibition scheduled for September 17-20, 1990 at the Rippling River Resort in Welches, Oregon. Bill Griffith, Conference Program Chairperson, has finalized a great event. This year we will again have the mixed general and split session format that has been so well received at our recent conferences. One of the split session tracks will be designed for golf course personnel and the other will be for parks, grounds, and athletic field personnel. Our feature speakers will be Dr. A.J. Turgeon of Penn State University and Dr. Robert Sherman of the University of Nebraska.

The 1990 Conference promises to be an excellent one and if I missed visiting with you at the Summerfest I hope to see you in September at Rippling River Resort.

(continued from page 1)

Housing reservations must be received by the Rippling River Resort by **August 15, 1990**, if registrants hope to get a room as a part of NTA conference room block. There are no guarantees concerning lodging availability after that date.

We are looking forward to a great conference and we hope you will be there to be a part of it all.

1990 Turfgrass Summerfest A Great Success

The second annual **NTA Turfgrass Summerfest** was a booming success. With the weather cooperating this year, attendance was even greater than last year. Estimates of between 250 to 300 people were in attendance at the WSU/Puyallup Research & Extension Center turfgrass field day and the equipment display and demonstration following at High Cedars Golf Club. The day before, over 100 golfers golfed in the **R.L. Goss Golf Tournament For Research** held at Canterwood Golf & Country Club.

In this year's equipment display and demonstration tripled in the number of suppliers from the previous year. In talking to those wandering through the display, everyone was pleased and impressed with the display and the participation.

Many individuals and companies deserve our thanks for making the summerfest the success it was. To mention a few warranting particular thanks, we want to recognize **Canterwood Golf & Country Club; High Cedars Golf Club; WSU/Puyallup Research & Extension Center;** and, **Wilbur-Ellis** and **Superior Turf Equipment**.

We also want to express our thanks and appreciation to the following suppliers demonstrating and displaying at the equipment show at High Cedar Golf Club: **Advanced Drainage Systems, Inc.; Barnett Implement Company; Briargreen, Inc.; Evergreen Outdoor Power; Evergreen Pacific Supply, Inc.; Lesco, Inc.; Machinery Components Company, Inc.; Pacific AGRO Corp.; Pacific Horticultural Supply; Puget Sound Seed Co.; Superior Turf Equipment; Turf Equipment Northwest, Inc.; United Pipe & Supply; Valmar Airflow, Inc.; Western Equipment Distributors; Yeager-Twose Equipment;** and, **H.D. Fowler.**

Suppliers advertising on the golf course at the tournament included: **JR Simplot Company; Madden Enterprises**; and, **PBI Gordon Corp**.

Others making miscellaneous donations to the cause included: **Montco/Surf-Side; Ringer Corp.**, and, **Dr. Stan Brauen**.

Research and Scholarship Fund Raising Campaign

Tom Wolff, chairperson of the NTA Research and Scholarship Fund Committee, asks everyone to remember the 1990 Research and Scholarship fund raising campaign currently underway.

Intimately involved with turfgrass management, we realize more than most, that today's turfgrass quality is the result of knowledge and technological gains resulting from research and education accompanied by hard work and effort. We owe our thanks to those who donate their time and money to make the research and education possible, for without them we would have to rely on our own slow trial and error methods.

Few of us are independently capable, nor prepared, to conduct the research or develop the education program necessary to keep the industry on the leading edge. Recognizing this, the Northwest Turfgrass Association created a research and scholarship fund to help make it possible for each of us to participate significantly in the advancement of present and future knowledge. Through this fund, each of us can financially contribute to industry research and education advancements.

Donation forms have been mailed to members and industry supporters. Contributions are tax deductible and those contributing to the research and scholarship fund each year are recognized in the NTA Annual Directory.

Buy a share today in better turfgrass for tomorrow.

1990/91 Turfgrass Topics Advertising Space Available

Invitations to advertise in the 1990/91 (October 1990—September 1991) quarterly issues of the **NORTHWEST TURFGRASS TOPICS** were mailed to potential advertisers this past week. The invitations were also mailed to non-supplier members of the association with hopes that they will pass the information on to suppliers they work with regularly.

Advertisers have made it possible for NTA to produce the quality, informative quarterly publication we have been receiving these past few years. We thank those who have advertised in the past and hope they will continue to advertise in the future.

NTA Gives $34,000 for Research

Each year the NTA Research & Scholarship Committee entertains proposals for the use of **NTA Research and Scholarship Fund** monies from the higher education institutions in the Pacific Northwest involved in some kind of turfgrass industry support activity. This year proposals requesting over $50,000.00 were received from WSU and OSU.

After extensive analysis by the committee and deliberations by the NTA Board of Directors, the following research grant request were approved for 1990/91:

OSU/Corvallis, OR Professor Tom Cook $3,000.00	Teaching Lab Facility
WSU/Pullman, WA Dr. William Johnston $13,000.00	Protective Turf Covers Necrotic Ring Sport Poa Annua Biotype Turfgrass Equipment
WSU/Puyallup, WA Dr. Stan Brauen $8,000.00	Water Use Efficiency in Turfgrass
WSU/Puyallup, WA Dr. Gwen Stahnke $5,000.00	Pesticide/Fertilizer Use Survey
WSU/Puyallup, WA Dr. Gary Chastagner $5,000.00	Necrotic Ring Spot

The $34,000.00 worth of research and support activity above are samples of how the NTA Research & Scholarship Fund monies are working to improve the industry.

R.L. Goss Golf Tournament for Research Winners

Winners in the **R.L. Goss Golf Tournament for Research** were as follows:

Low gross of the field was Mike Bauman (75). Flight winners were:

Flight No.	1st	2nd	3rd
One	Jeff Wright (74)	Greg Hall (75)	Noel Smith (75)
Two	Greg Baker (70)	Joe Alba (75)	Earl Omeg (75)
Three	Mary Jensen (76)	Crystal McIntyre (77)	Leo Finnegan (78)
Four	Jeff Landers (72)	John Coryall (74)	Darin Thompson (74)

The Golfing Boom

Gary Shampeny, The Toro Company

In recent years a lot has been written about the sport of golf; the increased participation the sport, the need for new courses to accommodate the increased demand, and the increased spending levels on equipment. Should you be a statistician, the numbers validate the afore-mentioned statements. So, let's take a look at the numbers.

The golfing public today numbers some 23.5 million people. The number represents daily fee, municipal and private golfers. Significant changes in the participation levels have only come since 1970. In the past 20 years we have experienced an increase in excess of 95%. Currently, male participation accounts for 76% of the golfers. How-

ever, the more encouraging number is that the greatest participation, 49%, comes from the 20-39 year age group. The next highest participation, being 26%, comes from the 40-59 year olds. Despite the high number of golfers in Florida (1.2 million), California (2.4 million), and Texas (1.7 million), more than half of all golfers reside in the Northeast and Midwest.

With all of these golfers and almost half still in the 20-39 year age group, the question is "Where are all of these people going to play golf?". Today we currently have approximately 13,600 golf courses to accommodate the 23.5 million golfers. Should you be a golfer, you know that we do not have enough facilities to accommodate our current golfing population. Tee times are difficult to arrange, green fees are rising, and the times to play an average round is increasing – 4 hours plus and maybe 5 hours plus. Remember, participation has increased 95+% since 1970, while the number of facilities has ONLY increased a meager 24%.

If golfers want to keep up with the same frustrations experienced today, and if there is 0% growth in the sport (that is that we maintain the current % level of participation), there has to be one new course opened every three days until the year 2000. If there is a modest growth of 2% there has to be one new course opened every day until 2000. A 3% growth rate would create the need for 3 courses every two days. The course-opening numbers, at the 0-3% rate will ONLY keep the same course-availability rate experienced today!

The sobering fact or realization is that the real growth rate is much more. During 1985-88 there was a 15% growth, 1986-87 saw a 7% increase, and 1987-88 saw a similar 7% increase. The resulting three-year average is 9%.

Construction levels are approaching those of the boom eras, 1920's (approximately 4,500 courses built), and the 1960's (approximately 4,000 courses built). Course openings in 1985 numbered 100, 1986 – 116, 1987 – 145, 1988 – 211, 1989 – 210 during the first seven months. Encouragingly, there are currently 450+ courses in the planning stage, and another 380+ under construction. Relief is slow in coming, but as can be seen, the numbers offer some promise.

Demands put forth by the golfer for better and better playing conditions throughout the golf courses have created many challenges for the golf course superintendent. Along with stricter regulations by various governing bodies and agencies, the challenges and costs of maintaining a golf course have and will continue to rise.

Manual-quick coupler irrigation systems are a thing of the past. dwindling water supplies have emphasized the need for automation. Automation to the degree of high efficiency sprinklers, controlled individually by satellite controllers, linked to personal computers loaded with site specific soil-slope-exposure-ET-species-varieties data, and in turn linked to a weather station feeding critical up-to-date information that the computer can utilize to make adjustments in the irrigation management schedule, and the use of effluent water as a water supply in arid areas and the use of the golf course as a disposal site for the effluent.

A current trend back to labor-intensive practices in the daily mowing regime is underway. Walk greensmowers are being used by an ever increasing number of private courses and yes, daily fee courses as well. Who would have ever thought of mowing fairways with riding greensmowers, a common practice of many golf courses. Increased aeration of all turf areas is seen; greens, tees, fairways and rough with labor-intensive equipment such as greens type aerators.

The current conditions, trends and practices translate into ever-increasing expenditures to equip new golf courses. It is not uncommon to see$1 million being allocated for new irrigation systems, and initial equipment purchases of mowing and related maintenance equipment in excess of $550,000. Utilizing averages; 250 courses being constructed annually, average irrigation of $100,000 and mowing equipment of $125,000. The new golf business annually generates $56 million.

YES, there is a golfing boom! It is a boom being driven by the demand of a large segment of our population in their selective years that desires to participate in the sport of golf. As a result of the changing environmental conditions and demands by the golfer, there are opportunities for the industry to supply products that are currently available or soon-to-be-developed to meet the challenges.

All parties involved, whether directly or indirectly, must take an active role in the golf boom to assure that it continues, and continues in a most favorable way.

Source: The Perfect Lie/June 1990

Dr. Gwen Stahnke is New Extension Agronomist

Dr. Gwen Stahnke is the new Extension Turfgrass Specialist and Assistant Agronomist with Washington State University located at the WSU/Puyallup Research and Extension Center. Dr Stahnke is from Illinois. Prior to coming to Puyallup, she was an Assistant Superintendent at Medinah Country Club at Medinah, IL, Area Agronomist for TruGreen Corporation and a turfgrass instructor in the turfgrass and landscape management training program at Lace City Community College in Florida. She has also been employed in the sod production industry in Georgia.

Gwen received a Master's degree under Dr. James Beard at Texas A&M University and completed requirements for the doctorate degree under Dr. Robert Shearman at the University of Nebraska last summer. She spends 75% time in Turfgrass Extension in a similar position vacated Dr. Goss and the remaining 25% appointment is spent in turf science research. She arrived at Puyallup around September 1, 1989 in time to be introduced at the NTA annual conference in Tacoma and she will be a speaker at the the upcoming conference in Rippling River.

Gwen can be reached by calling the WSU/Puyallup Research and Extension Center at (206) 840-4513.

Turfgrass Research You Can Use

by Dr. Ali Harivandi, U. of California

Turfgrass research and extension in the West continues to be as strong as ever. Although the retirement of several productive researchers in the past few years created a vacuum in several locations, now that all these positions are "refilled", the western turf research and extension is in full swing again. The following are examples of research which should be of interest to readers.

Turfgrass Research *(continued)*

Species and Variety Development

Wu, Huff and Harivandi, UCA-Davis, reported their findings of a series of experiments with the goal of improving and introducing a better quality buffalograss (Buchloe dactyloides) to the market. This cultivar exhibits high turf density, extended winter green color and rapid growth rate. It is also highly drought resistant.

Baltensperger, NM State U., released a new seed propagated bermudagrass (Cynodon dactylon) variety named 'NuMex Sahara', developed for shorter internode length, greater turf density and increased summer green color. NuMex Sahara has received higher turfgrass quality ratings than the other two seed-propagated bermudagrass cultivars, Common and 'Guymon'.

Henry, Gibeault, Leonard and Cockerham, Riverside, evaluated several new zoysiagrass (Zoysia spp.) lines developed by UCA to determine their response to nitrogen fertilizer. During the warm growing months, the zoysiagrasses required high application rates to effect acceptable turf color ratings. Osmocote at the high rate gave the most sustained color response. Generally, the higher the nitrogen rate the greater the weed infestation.

Some turfgrass species, such as bermudagrass, bluegrass (Poa pratensis), and bentgrass A grostis spp.), are recognized as thatch-builders while others, notably tall fescue (Festuca aurandineacea) and perennial ryegrass (Lolium perenne), are perceived as having no thatch accumulation problem. It was surprising, therefore, to find a substantial thatch layer present in plugs taken from a mature sward of turf-type tall fescue by UCA Riverside researchers Leonard, Autio Gibeault and Cockerham. Further sampling indicated a positive correlation between improved texture and increased thatch.

VanDam, Leonard and Gibeault, UCA-Riverside, evaluated the performance of both annual (Lolium multiflorum) and perennial ryegrasses along with tall fescue and roughstalk bluegrass (Poa trivialis) for dormant bermudagrass overseeding purposes. Their study demonstrated the persistence of overseeded perennial ryegrass, as well as tall fescue, for more than one season. It also proved the good compatibility of tall fescues with common bermudagrass.

Water

Hays, Mancino, Forden, Kopec an Pepper, UAZ-Tucson, evaluated the use of secondary municipal sewage effluent for irrigation of common bermudagrass overseeded with perennial ryegrass. Effluent irrigation lead to significantly lower seed germination and resulted in higher EC, Na, nitrate-nitrogen (No3-N), P and K concentrations in soils. Based on visual evaluations of turf quality, secondary municipal sewage effluent was used successfully for turf irrigation but the researchers cautioned that the greater Ec, Na and nutrient content of the water needs to be considered by the turf professional making management decisions.

The effects of different subsurface drip line spacings (24, 35.8, and 48 in., respectively) on bermudagrass response for two soils (sandy loam and clay) when using saline water (EC = 2.2 dS/m) for irrigation was investigated by Devitt and Miller, UNV-Las Vegas. The results showed that salinity was the major limiting factor for turf production under subsurface drip irrigation in the sandy loam soil, whereas in the clay soil the major limiting factor was availability of soil moisture.

Gibeault, Meyer, Autio and Strohman, UCA-Riverside, conducted a study to evaluate the turf quality of low-water-requiring turfgrasses and ground covers when irrigated at low irrigation levels and maintained with regular mowing. Of the 27 turfgrasses and ground covers tested in this study, bermudagrasses and seashore Paspalum (Paspalum vaginatum) were the best performing turfgrasses under very low irrigation regimes. Two species of saltbush (Atriplex spp.), buffalograss, and two varieties of Phalaris also gave comparatively good cover and quality.

Pests and Pesticides

The recent increase in demand for low maintenance turf and landscape plants makes hard fescue, (Festuca longifolia) a prime candidate for a minimum maintenance "grass" ground cover (non-mowed turf). To evaluate hard fescue's reactions to commonly used herbicides, a series of studies were conducted by Harivandi and Elmore, UCA. The results of postemergent herbicides application indicated that the treatments containing MSMA alone or in combination with broadleaf herbicides (i.e., Quadmec) injured hard fescue after one application. None of the other postemergent herbicides injured the turf above a rating of 3 on a scale of 1-10.

Kopec, et al., UAZ-Tucson, conducted a study to determine the effects of turfgrass cultivar, mowing height an dimazaquin herbicide (Image) on purple nutsedge suppression. the data showed that a combination of all factors, grass type, mowing height, and herbicide effects are effective in reducing purple nutsedge infestation levels in turfgrass stands.

Ali Harivandi, UCA, conducted a study to determine the efficacy of selected insecticides for whit grub control. The insecticides evaluated were Triumph 4E, Mocap 10G, and fonofos 5G. Triumph at 1 lb ai/Ac provided the highest control with 74% reduction, followed by Mocap at 5 lb ai/Ac with 66, fonofos at 6 lb ai/Ac with 39% and fonofos at 4 lb ai/Ac with 27%.

Recently, a root-knot nematode problem on warm seasons grasses was reported in southern California. Because of the implications of spread of this nematode during vegetative propagation, a series of trials were conducted by Radewald, Shibuya, and Westerdahl, UCA-Riverside on various methods of control. Dry heat as well as hot water dips were investigated. Chemicals were not considered to be a reasonable approach for controlling this pest on planting material. It was found that the nematode could successfully be controlled with the hot water dips and the grass would survive the treatment.

Fertilization

Media used in golf green construction are typically at least 75% sand by volume. Fry, Harivandi, and Minner, COSU, conducted a field study over 8 years on a sand medium to determine creeping bentgrass quality response to phosphorus (P0 and potassium (K0. A significant response of creeping bentgrass quality to increasing P level was observed each year. Potassium had no effect on visual quality of creeping bentgrass.

The California lawn care industry requires nitrogen fertilizers that provide fast initial color response, uniform dark green color, and a residual response that lasts 8 to 10 weeks. Studies have been conducted by Gibeault, Leonard and Cockerham, UCA-Riverside, to evaluate nitrogen source, application rate, and timing on cool season

required time period irrespective of nitrogen source.

Several zoysiagrass lines were evaluated by Henry, et. al., UCA-Riverside, to determine their response to turfgrass nitrogen (N0 fertilizer sources and application rates. The zoysias responded to (N0 in a linear manner with slow release fertilizers requiring high application rates (4 lbs. N/ 100 ft2) gave the most sustained color response.

Bowman, UNV-Reno, has continued research on the fate of fertilizer nitrogen. The potential for direct root absorption of three new slow release fertilizers has been identified, and studies are underway to characterize nitrogen mineralization from these products. Studies on the foliar absorption of soluble nitrogen sources by several turfgrasses, using 15/N-labeled fertilizers, indicate that a large fraction of the applied N remains on the turfgrass leaves. Of the nitrogen absorbed, most is partitioned between new and old leaves, with very little being transported to the roots.

Growth Regulators

Brauen, et al., WSU, have studied application alternatives of growth regulator mefluidie (Embark) and have been successful in reducing visible turf injury due to phytotoxicity. Nearly 80% growth reduction of turf and 80% of annual bluegrass seedheads were controlled with 1/4 pint/acre of Embark. Embark significantly increased turfgrass discoloration at all rates (1/4 to 3/4 pint/acre), but the addition of Ferromec (at 1.4 to 2.7 gallon/acres) corrected 40 to 80% of the discoloration and produced good quality turf.

Devitt and Morris, UNV-Las Vegas, conducted an experiment on common bermudagrass in the greenhouse using three soil types, four nitrogen (N) levels and three plant growth regulators. Cutting biomass, cumulative height, turf color,and evapotranspiration were studied over a 9 week period. Cutless (flurprimidol) reduced cumulative height by as much as 83% and water consumption by as much as 27%. Embark (mefluidide) and Limit (amidochlor) did not provide significant long-term height suppression at any rate or any N level on the three soils.

Other Research

Solid-tine and hollow-tine and alternate solid/hollow-tine aerification were studied by Brauen, et. al., WSU, for five years at 0, 2, 4 and 6 times annually on an established bentgrass fairway type turf. Sanding followed each aerification and cores from hollow-tine aerification were removed from the plot area. The average thatch ashed dry weight, depth, and density measurements after five years were not significantly different between aerification types used, but hollow-tine and alternate hollow/solid tine systems were numerically more favorable than solid-tine. Only the intensity of aerification was effective in reducing the rate of increase of thatch depth and 2 or 4 aerifications were insufficient to keep thatch in check from prestudy levels. Density of thatch was decreased by all aerification methods, but hollow-tine was more effective than solid-tine.

Morris, Devitt and Bowman, UNV, have investigated the possibility of disposing composted municipal sewage sludge on turfgrasses. Growth and mineral composition of tall fescue in response to sludge loading rate and soil type were examined. It was concluded that loading rates of up to 60% by volume may be effectively used to produce excellent turf growth.

Water Conservation: Our Shared Concern

The drought of 1988 created public awareness of an issue that the turfgrass industry has been concerned with for years. Water is a precious commodity. It is not unlimited and, without it, life, as we know it, cannot exist.

Given this undisputable fact, the Minnesota Golf Course Superintendents' Association (MGCSA) has responded by assuming a proactive stance in identifying water use by its member courses and charting a course of action that will further encourage wise use of this limited resource.

The logical starting point was to identify the industry status quo. A survey of member clubs was conducted. Data gathered from the survey and other sources are presented as the base from which to develop a responsible course of action. Data from and action by the golf industry in Minnesota pertinent to this process area:

- **Directly generates revenues** between $255,000,000 and $300,000,000 annually.
- **Generates in excess of $18,000,000** in state sales tax revenue annually.
- **Provides** more than 16,000 jobs.
- **Over 20% of golf rounds** impact tourism.
- **75% of the respondents** host charitable events with 54 specific charities identified. Golf has been documented in one area to be second only to United Way in raising funds for charity.
- **Host numerous events** for recreation and/or competition for juniors, junior and senior high school boys and girls, senior citizens, college, university and corporate participation.
- **No segment of the turfgrass industry** spends more on research and updating of equipment aimed at conservation, including computer-controlled irrigation, drought-tolerant grasses, tensiometers, surfactants, cultural practices and others.
- **80% of the respondents** reported using some form of water conservation.
- **Establishment** of a full-time Water Resources Committee. The golf industry in Minnesota has an enormous impact on the quality of life that we are so proud of in our state. Besides offering the recreational and competitive opportunities already mentioned, each individual golf course property has an environmental impact in the following way:
- **100 acres of actively growing turf** produces enough oxygen to support approximately 7,000 adults.
- **This same process is the greenhouse effect in reverse** as carbon dioxide is used to produce the oxygen.
- **Grasses reduce undesirable noises** by 20-30%.
- **Wildlife is attracted** to grassy and treed areas.
- **Grasses modify temperature.** This same 100 acres has the cooling capacity of more than 7,000 tons of air conditioning.
- Grasses absorb and reduce glare.
- **A typical golf course will recharge the water table** with approximately 10 times the amount it uses.
- **Dense turf has more than three times** the water infiltration rate of thinly covered areas.
- **Grasses absorb pollutants and trap particulate matter** from the atmosphere.
- **Grasses are the most effective form** of plant life for the prevention of soil erosion.

Numerous other environmental, economic, mental and physical health statements can be made. however, the above is meant to be indicative of the contribution that the game of golf makes to the State of Minnesota and the respective communities that are located within the state.

The MGCSA study found that an average of nearly 300,000 gallons of water per acre were used in 1988 on the courses whose superintendents responded to the questionnaire. One disturbing thing that became obvious was that some do not know how much water they use on their property.

As a result of this study and its on-going concern for its industry and the environment, MGCSA commits to the following action items:

- **Encourage the installation of effective metering devices** on all golf course irrigation systems in the state of Minnesota.
- **Permanently install a functioning committee** for the increased conservation of water and other resources.
- **Intensify the educational opportunities** available to our membership, specifically addressing water conservation.
- **Continue contributions**, and expand as resources permit, to research dedicated to water conservation in areas such as irrigation equipment, plant breeding and selection for better drought tolerance as well as lower water use, and cultural practices that will reduce the use of water, reduce run-off, improve water retention and facilitate the expanded use of effluent water.

Source –MGCSA Water Resources Committee

The Green Industry–How Big is It?

The Green Industry Council acquired the services of a professional survey firm, Spectrum Economics, Inc., to conduct a survey of the green industry in California. The results of that survey were recently completed and published in a report. The following is an executive summary of that report.

The Green Industry keeps urban California alive and beautiful. This vital industry includes landscaping services, retail and wholesale nurseries, garden stores, florists, golf courses, and garden equipment manufacturers. Altogether, they employ over 140,000 people with a payroll of over $2 billion. retail sales total over $6 billion. Makers and sellers of irrigation equipment, fertilizers, and agricultural chemicals and public employees who maintain public plantings, are in addition to these key sections of the Green Industry.

Agriculture, the consumer of the vast majority of California's water, is often thought of as California's largest industry. Actually electronics is now California's largest industry. Furthermore, keeping urban California green and beautiful, the job of the Green Industry, is our largest agricultural industry. The $5 billion total retail sales of urban agriculture – the Green Industry – come close to equalling total California farm sales, which were only $8 billion in 1987., There are over 15,000 establishments in the Green Industry with an average of about eight workers per firm.

Spraying With Oil In Summer

Horticultural oils, complex mixtures of petroleum hydrocarbons, have traditionally been used in the spring as dormant oils to control insect pests of woody ornamental landscape plants. It was believed that summer use of such oils would harm the plants.

Several oil-refining companies make many grades of horticultural oil and they are labeled for different purposes and seasons of application. New research shows that new-generation oils can safely be used in the summer, and on a great variety of plants.

In fact, horticultural oils can be applied anytime specific pests and diseases are identified in the garden, not just in the spring.

The new oils are relatively non-toxic and safer to use than most other products now available. In fact, oil in its purest form can literally be eaten by humans, with no damage.

Horticultural oils can be used safely and effectively to control a wide variety of garden pests: sucking insects such as aphids, leafhoppers, and mealybugs; scale insects; and the larva and egg stages of insects such as caterpillars, sawflies, and leaf-feeding beetles.

The oils are not nearly as hazardous to beneficial garden predators such as ladybugs, nor do they interfere with naturally occurring parasites that also help control garden pests.

The oils are not toxic to wildlife, but should not be used near ponds or other areas that contain animals that breathe through their skin or gills.

Horticultural oils, when used and applied correctly, are so safe they can even be used on indoor plants.

Tender plants, including foliage plants and annuals, can be safely treated with the oils.

The oil can be sprayed on garden vegetables and fruits and will leave no residue; in fact, produce could be consumed just after spraying, with no harm to the consumer.

The oils should not be applied on plants that are water stressed. Plants should be growing vigorously and show no signs of wilt, before the oil is applied. Do not spray on flower blossoms; spotting may result. The oil is not as effective against pests in the adult stage. As in any sensible pest management program, the pest affecting the garden, and its current life stage, should be identified before any control is used, including oil.

If the oil is used in a higher dosage than the label specifies, the plant could be harmed. And if used on conifers that have a bluish tint, such as the Colorado blue spruce or blue rug juniper, the color will be affected.

"The plant itself won't be harmed and new, unsprayed foliage will grow in the desired bluish tint."

Nor should oils be used on the eastern black walnut, which is harmed by them.

Another problem is that summer use of horticultural oils is a new enough technique that only one company is now promoting summer spray oil: Safer Products is the only source and sole distributor.

If gardeners check the label on other products, though, they may find others that can be used for spring and summer spraying, and other agricultural chemical companies are currently working on developing and labeling a summer oil.

Resource: Warren Johnson, Department of Entomology, New York State College of Agriculture and Life Sciences, Cornell.

Lawn Wastes Continue To Pile Up

by Robin Pendergrast

What to do with lawn waste such as grass clippings, leaves and shrubbery is no longer a problem that can be swept away easily. To put it plainly, the problem has become a big mess that eventually will require lawn maintenance firms, homeowners and local legislative officials to pitch in and clean it up.

But right now, lawn maintenance firms are caught between a rock – in this case, current and pending legislation to ban grass clippings and other lawn debris from public landfills; and a hard place – customers who expect a well-groomed lawn to mean a lawn with no clippings.

It's the Law

Legislation to ban lawn debris has been smoldering for years. But recently smoke has turned to fire. Some states have banned debris outright from public sites while dozens of their legislatures are contemplating the same. The reasons for recent legislation is obvious: during the past 30 years, throw-away refuse in this country has increased from 80 million tons annually to approximately 200 million. In that same time, the number of landfills has decreased from 30,000 to about 6,000. Half of those will be full by the mid-90's.

As a result, Illinois, Wisconsin, Florida and MInnesota are among states that will enforce bans, beginning in 1990, prohibiting landfills from accepting grass clippings and brush. New Jersey already has banned leaves from its landfills, while Pennsylvania and Connecticut have done likewise. By 1993, clearly half the states in the union could have similar bans in place.

The Environmental Protection Agency (EPA) is supporting such legislation to decrease the load on landfills an to avoid some of the potentially toxic waste found at landfill sites.

Viable Solutions

Landowners need to know there is a problem and what they can do about it. They probably don't want to let their

grass clippings lie, so they must be educated why and how they can make the most of their yard wastes.

Tell them blades of grass are essentially bundles of water-filled green straws. The moisture and nitrogen in the clippings nourish the lawn and help to save water. When clippings are kept short, they decompose rapidly an do not contribute to the buildup of lawn-choking thatch.

Let them know the value of composting their leaves, explaining how to do it. The process involves formulating a compost pile four to six feet wide in an isolated area. Mix leaves into the pile in four- to six- inch layers, along with garden soil and other matter. Potato peelings, onion tips, old newspapers and even dead fish have been used to make compost. The pile should be kept moist.

After brewing throughout the winter months, the pile's contents will be ready to assume its soil-enriching role in the spring.

Keep customers informed about local community efforts to create a common composting site. Even let them know what they can do at home in addition to composting; e.g., using old orange juice containers an mayonnaise jars for planters.

Providing recycling information will help everyone in the long run while enhancing your image now as a professional lawn maintenance firm.

State of the Art

Everyone must pitch in.

Manufacturers such as Snapper, John Deere, Simplicity and Toro are aggressively pursuing debris-handling solutions via equipment modifications. Snapper, for example has devised a lawn mower accessory that grinds and shreds leaves into a compostable material. John Deere, among others, has published recycling and composting booklets to help get the message across. And Lawn-Boy is conducting a national community education campaign on this issue.

Non-power manufacturers have also answered the challenge. Minnesota-based Ringer Corp., a producer of turf and lawn-enriching products, is currently marketing materials to turn brown leaves and grass clippings into compost in as little as 60 days. Gardener's Supply of Burlington, VT, has introduced the Green Magic Compost Tumbler, an easy-to-put together bin for making a backyard compost pile.

Neutralysis USA of Northfield, IL, has formulated a process that does more than dispose of all types of excess waste. Within the process, waste is channeled into a kiln and turned into an energy source for manufacturing a clay aggregate to be used in construction. The first neutralysis plant in the United States is under construction in Saginaw, MI, and is scheduled to begin processing in 1992.

Down the Road

The waste disposal problem seems to become more widespread and complex every day. The November 27, 1989, issue of Newsweek featured a cover picture of garbage spread across a map of the United States and a story describing how the situation is assuming extreme proportions.

As the waste disposal problem persists, the technology to deal with it will become more complex. But technology alone is not the answer. Lawn maintenance firms, homeowners, manufacturers and legislators must work together to keep the lawn waste disposal problem from accelerating into an even bigger predicament.

Robin Pendergrast is a partner with Illinois-based International Marketing Exchange.

Misdirected Good Intentions Can Spell Trouble: Are You Chemically Dependent?

by James F. Moore, Director, Mid-Continent Region, USGA Green Section

The greatest challenge ever to our careers, our industry, and our game is racing towards us with the speed and power of a bolt of lightning. That challenge is the concern for our environment. And these thoughts are directed toward representatives of every aspect of the golf industry – club leaders, superintendents, golf professionals, managers, architects, golf course builders, trades people, researchers, and players.

I take great pride in calling myself an optimist. I admire people who, when you ask them how things are going, answer with an emphatic "Good!" Perhaps it is this optimism that leads me to believe that the entire environmental issue (which many of you see as a threat at this time), will actually benefit our game and industry in the long run.

However, I also believe that we are in for some very tough times at first. While optimism is wonderful, pessimism suggests that many of us will not be up to the challenge. Let me share my perception of the near future that is blended with optimism, pessimism, and what I hope you will agree is a great deal of realism

In the near future, the number and amount of pesticides available will decrease tremendously. No amount of lobbying will prevent this. Public perception, whether right or wrong, is growing that all pesticides are bad, and those who use them are harming the environment. Once this occurs, some superintendents will find the "tools" they have relied on so heavily in the past are no longer available.

Not all superintendents are good turf managers. There are those who are able to keep their courses in good condition because they can apply enough pesticides an spend enough money to compensate for a lack of turf management skills. There are also many who actually cause more problems on their courses than they correct. Some apply chemicals a nonchalantly as they do water. The "preventive program" includes apply products to protect against virtually every known turfgrass pathogen. Imagine what would happen to your health if your physician used this same logic.

Invariably, it is this superintendent who finds his greens suffering one crisis after another. His response is to apply even more chemicals on a curative basis. This superintendent and his course are truly chemically dependent. When allowed to progress far enough, this vicious cycle of events often results in the failure of large areas of turf and eventual replacement of the superintendent.

Because the science of our industry has not yet progressed to the point that we can completely eliminate pesticide use while meeting the demands of the player, even the best turf managers are likely to experience problems when pesticide restrictions are significantly increased. However, their courses will fare much better than most and will serve as clear indications of the value of a skilled superintendent. His stock will rise significantly. Those of you who

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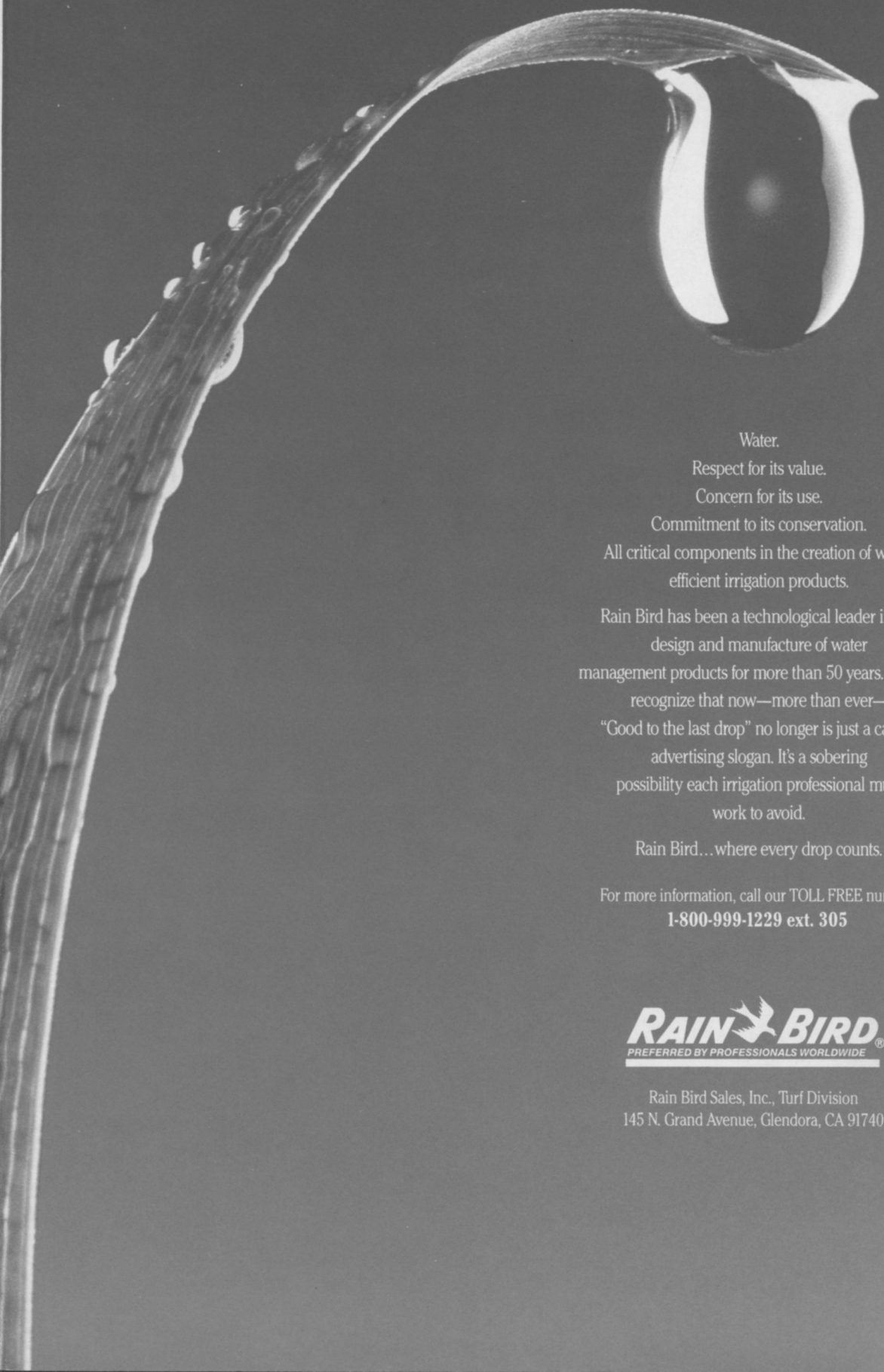

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fall into the category will gain from the demise of your less-skilled colleagues.

Soon a superintendent will not be able to apply pesticide based only on his perception about when they should be applied. The leadership of golf clubs will determine when and if applications can be made. Their decisions will be made based upon reducing the club's liability to the extent possible. The risk of lawsuits will be given much higher priority than the superintendent's assessment of the risk from pythium and brown patch. The first reaction to reduce the club's legal exposure will very likely be to require all pesticide applications to be made when the club is closed. While this may seem a blessing at first, since more superintendents would love to see their courses closed one day each week, it is likely that such a restriction would actually backfire interims of reducing pesticide use.

Superintendents would find themselves applying pesticides based strictly on the calendar rather than on actual need. If brown patch pops up on Wednesday, how many superintendents will be able to walk until the following Monday to treat? Since most will feel they cannot, the natural reaction will be to treat every Monday to ensure problems do not arise during mid-week.

In the not-too-distant future, the cost of applying pesticides will skyrocket. The products will cost more due to the testing expenses, labeling requirements, and lawsuits against manufacturers. Pesticides and the rinsate will require special handling and storage containers. Insurance akin to malpractice insurance carried by physicians will be required by superintendents. To compensate, clubs will be forced either to increase the maintenance budget or accept a reduction in the overall appearance of the course. Realistically, most clubs will choose a combination of these two options.

The application of fewer pesticides on golf courses will result in courses that are less immaculate than the average golfer has come to expect. While the perceived quality of most courses will suffer, those courses managed by a superintendent who has relied too heavily on pesticides will deteriorate the most. Without the equalizer of unlimited pesticide availability, the varying abilities of turf managers will be highly visible to all.

You may not accept all of these predictions. However, if you accept even one, you must also accept that our industry and the game of golf will be strongly affected. Many will choose to ignore the inevitable until it is too late. You assume the industry associations will handle your public relations, the researchers will develop chemicals that are so safe they will have Rachel Carson's picture on the label. You will not be up to the challenge and you will not survive.

If you are a superintendent, you might blame your demise on the USGA and the Stimpmeter. The architect can blame the golf course builder who did not follow his plans. The builder can blame the superintendent who can't properly "grow in" the course. The USGA agronomist can blame the architect who made the course too difficult to maintain. What a party we can have. Ironically, the only thing that may keep us all from cutting each other's throats will be a shared dislike of the organizations we consider environmental radicals, along with their lawyers.

Or . . .

We can each take steps right now to prepare ourselves. Let's become "survivalists" not by stockpiling guns and ammunition but by reducing our exposure to the threat.

Immediate options are available to each branch of our industry.

To the superintendent: Learn to be a better turf manager. Emphasize your skills in water manager, disease identification, soils cultivation, and fertilization. Review the principles you learned in Turfgrass 101 and simplify your programs as much as possible. A strong, healthy turf is unquestionably your best defense. You have a history of being the greatest and boldest experimenters with new products. It is time to begin to experiment more with doing with less. Use every skill you have to reduce your chemical needs.

To players and club officials: Realize that you will be affected by these changes in the industry. Understand that absolute perfection on the course is no longer a realistic goal. Greater emphasis should be given to playing quality and the agronomic needs of the turf. Quit judging a superintendent's worth based on the speed of the greens. Realize that nature cares very little about your tournament schedule and that maintenance practices must be given higher priority than they have in the past. Consistent management is vital. Develop long-range plans and quit changing green chairman every year.

To the architect and golf course builder: Al those involved with the development of new courses must make major changes. Stop selecting grasses with total disregard of local climate. Just because a turf can be grown (with enough pesticides and a big enough budget) does not mean it should be. Stop cutting corners on green construction. Stop building greens in holes where air movement in non-existent. Pay greater attention to drainage throughout the property.

To the researcher: Give us facts. Prove that what we are presently doing is not harmful, if that is the case. However, of equal and even greater need in my eyes is the identification of what to expect and do under low or no pesticide use. And, of course, the continued development of superior turfgrasses is critical.

To the golf professional: Emphasize playing quality to the golfer. Remind players that golf is a game to be enjoyed, not an exercise in frustration or an opportunity to be critical. Emphasize the positive aspects of your course. With the help of a good pro, even the smallest budget can give great enjoyment to the player.

To my colleagues in the USGA; Let us avoid the temptation to offer quick but short-lived fixes to problems. While solid agronomic advice may not be glamorous or offer instant improvement, it is what is needed most of all. We are perhaps in the best position to gather the facts from other groups and disseminate them to the entire golf industry.

To the leadership of the USGA: I hope our organization will use its tremendous influence to educate golfers and make them more receptive to changes that are coming. Equally important will be the continued funding of turfgrass research.

To those who are not a part of golf: Realize that golf is an industry that does care for the environment. Golf courses have tremendous positive effects on both the land and the people who use it. This should not be a case of you versus us. We will stand a better chance of achieving common goals if we work together.

As I said, I am an optimist. I see the significant challenges we face as an opportunity to better our industry, our

game, and ourselves. Let's make the power of the lightening bolt work for us instead of against us.

GCSAA Gives $35,000 For Research

The Golf Course Superintendents Association of America (GCSAA) will present a record $35,000 contribution to the joint USGA/GCSAA Turfgrass Research Committee to support research into turfgrass breeding environmental considerations. GCSAA will make the presentation to the United States Golf Association during the 1990 U.S. Open.

"We certainly appreciate the support the GCSAA has shown us — not just the financial support, but also the moral support that golf course superintendents have given us," said Dr. Mike Kenna, USGA research director.

Last year GCSAA — through its Scholarship & Research Fund — donated $25,000 to the committee for general support of turfgrass research and an additional $25,000 earmarked to fund a full review of all scientific literature on the environmental impact of golf course management practices. Results of the review are now serving the starting point in the development of a comprehensive manual of best management practices. GCSAA's 1990 contribution will go into the committee's general fund and will support research that results from the review's findings.According to Kenna, even though many superintendents already consider the environmental consequences of their management practices, the manual will provide needed documentation of environmentally responsible pest control. "I feel confident that we're in good shape to meet the challenges not only of the '90s, but of the next century as well, especially in the area of water use," Kenna said.

We have Created a Monster!

by Dave Feavis, CGCS

At a recent superintendents' meeting, one of the topics of conversation was the comments made by the golfers concerning the condition of the courses during our recent heat wave. By heat wave, I mean temperatures reaching into the 100s with hardly any rainfall. Comments like, "How come there are dry spots on the course when our lakes are full?" or "Why can't you sod that worn area by the cart path on #6?" Little do the golfers know or even attempt to understand that just because you might have an unlimited supply of water, dry spots can still occur, or you're not going to lay sod when the temperature is over 100 degrees. The problem is , we have created a monster! That monster is the golfer who expects perfection and doesn't remember five-10 years ago when the conditions of golf courses were far below what they are today. A decade ago, golfers were happy with good greens; then it evolved into good tees, then good fairways. Now it is to the point of everything better be good, even the rough.

If you haven't read the August issue of GOLF maga-

zine, do so. Frank Hannigan has authored an article called "A super job." He refers to situations like, "If the clubhouse manager and the pro stopped showing up for work, the club members would be inconvenienced. But if the course superintendent and his staff go on strike, the game is over." In two weeks you would have what's known as a "passive recreational park" with a lot of tall weeds." He further comments, "There is also increasing pressure to produce putting greens that are super fast, like those at the Masters or at a U.S. Open. Golfers don't understand that those greens have been specially prepared for one week. They can't possibly be maintained at such speeds throughout the year." My favorite quote of the article is when Mr. Hannigan makes reference to the touring pros ":crying" about the condition of the greens and Mr. Hannigan comments, "Klauk kept his temper. He managed to restrain the impulse of saying, 'Who the hell are these guys who have never done a thing in their lives except hit golf balls to criticize my work and my golf course?'" In one of the final paragraphs of the article, realization strikes when Mr. Hannigan says, "Superintendents get fired. As a rule of thumb, if the superintendent has two bad years in a row, even if the climate has produced noting but fire and brimstone in that time, he's gone— and he goes without a golden parachute."

how are we going to tame this monster? Good question! The only way that I know how is communication, communication, and more communication. The days of us being "grasscutters" and "hiding" in the "maintenance shack" are gone. We have to be visible and quell the rumors and misunderstandings before they start.

Agency Adopt Rules on Use of Pesticides

Olympia – The Department of Labor and Industries (L&I) today adopts new rules for workplace safety and health on the use of pesticides.

The rules were proposed at a series of public hearings in January and have been adopted with minor changes as a result of public testimony.

Among the areas affected are:

WAC 296-306-400, posting requirements regarding the use of pesticides. Growers may opt to use the official Environmental Protection Agency (EPA) warning sign instead of the adopted L&I warning sign. Growers also must post warning signs at least 24 hours before the pesticide application, but not more than seven days before application.

WAC 296-306-40003, general requirements for the use and storage of pesticides on agricultural crops. Employers must meet certain requirements for data on pesticide records.

WAC 296-306-40005, pesticide record form, which makes minor changes in record keeping requirements. Four versions of the pesticide application record form have been adopted. Growers may choose the form that best meets their needs and type of operation, i.e. single applications, repeat applications or irrigation system applications.

These rules were designed in conjunction with the Washington State Department of Agriculture.

For more information about the rules or for copies of the standards, contact the department at (206) 753-6381 or write to: The Department of Labor and Industries, Technical Services Section, 805 Plum St. SE, Mail Stop HC-432, Olympia, WA 98504.

Pesticide-Contaminated Clothing Requires Special Attention

Applicator safety is a key component of any superintendent's overall management plan. In properly educating and training employees, turf managers invariable stress the need for pesticide applicators to handle the chemicals they work with in a safe and professional manner.

GCSAA, through educational offerings and service on the Environmental Protection Agency's Pesticide Packaging Committee, has taken a leadership role in continually reminding the turf industry and its professionals of the necessity for safe container design **and** handling.

At the beginning of every work day, while you are still fresh, it's easy to remember the basic rules of applicator safety. At the end of a long and tiring day spent maintaining acres of valuable turf, though, it's easy to forget that the clothing you've worn while applying turf chemicals demands special attention. While many course now have disposable coveralis, it's important to keep in mind these basic tips, supplied by Cornell University's Cooperative Extension Service, when laundering pesticide contaminated clothing:

- Don't wash your work clothing at home with your family clothes. Chemicals in your clothing can easily migrate to other clothes in the same washload. Consider providing a washing machine on-site, specifically dedicated to the washing of pesticide-contaminated clothing. (For some operations, an outside laundry service may be the best answer.)
- When pre-rinsing, use one of three methods: hose off the garment outdoors, rinse in a separate tub or pail, or agitate in an automatic washer. For garments that are heavily contaminated, be sure to use a concentrated-strength liquid.
- Wash garments that are contaminated with the same pesticide together.
- Wash only a few garments at once. Resist the temptation to load the washer as full as possible or to save up clothing for one big load.
- Be sure that you use a full water level and that you use **HOT** water, preferable 140 degrees or higher.
- Be sure to use the normal, full 12 minutes of your wash cycle.
- Use heavy-duty detergent in the amount recommended on the package. If your clothes are heavily soiled or if you have hard water, increase the amount of detergent.
- Use tow full rinse cycles.
- Line dry your clothing to avoid any possible contamination of your dryer.
- After the wash cycle has finished and you have emptied your clothes, run your washer through a complete, but empty, cycle. Use hot water **and** detergent during this empty cycle.
- Wear waterproof gloves when handling highly contaminated clothing. Dispose of these gloves periodically.
- Remove contaminated clothing, if possible, outdoors or in a specially-designated area. Be sure to empty your pockets and cuffs.
- Save clothing that you wear while handling or applying chemicals for that use only.

- Wash contaminated clothing after each use. When applying pesticides daily, wash clothing daily.

Make these recommendations part of your applicator safety training to help ensure that your workers stay safe, healthy and on the job.

Employment of Minors in Agriculture

Rules for minors in agriculture were proposed March 21 by the Department of Labor and Industries. Public and expert testimony was sought at seven hearings statewide April 24 through May 9. Final rules will be effective Nov. 1, 1990, except meal and rest break requirements, which will be effective Aug. 1, 1990.

The rules, developed in conjunction with the Advisory Committee on Agricultural Labor, cover hours of work and other employment standards for children under age 18 working agricultural labor. The rules do not apple to immediate family members of farm owners.

Age of employment

The minimum age to work will be 14. Children 12 and 13 can work only during non-school weeks for hand-harvesting or hand-cultivating of berries, bulbs, cucumbers and spinach.

Hours of work

Age 12 and 13: Can work up to eight hours a day and 40 hours a week during non-school weeks.

Age 14 and 15: When school is in session, 14- and 15-year-olds can work up to three hours a day before or after school and up to 21 hours a week. This includes up to eight hours per day on weekends. When school is not is session, they can work up to eight hours a day and 40 hours a week.

Age 16 and 17: When school is in session, 16- and 17-year-olds can work up to four hours a day before or after school and up to 28 hours during school weeks. When school is not is session, they can work up to 10 hours per day and 50 hours a week. For the when, hay and pea harvests, up to 10 hours a day and 60 hours per week is permitted.

Start and Finish times

Age 12 and 13: 5 a.m. to 9 p.m., when school is not in session.

Age 14 and 15: On school days, 7 a.m. to 8 p.m., except for work in dairy, livestock and irrigation, which can begin at 6 a.m. On non-school days, 5 a.m. to 9 p.m.

Age 16 and 17: 5 a.m. to 10 p.m., but not later that 9 p.m. on consecutive school nights preceding a school day.

Days per week

All minor workers can work a maximum of six days per week. Those who work in dairy, livestock, hay and irrigation may work seven days per week, with one day off every two weeks.

Prohibited and hazardous employment

Minors under age 16 are prohibited from certain dangerous work as prescribed by federal standards. Federal work prohibitions include operating corn pickers and grain combines.

The following prohibitions apply to all minors:

- Handling, mixing, loading or applying dangerous pesticides.
- Transporting, transferring or applying anhydrous ammonia.
- Handling or using blasting agents, such as dynamite or blasting caps.
- Harvesting crops prior to the expiration of the pre-harvest interval. The pre-harvest interval is the time required between the last pesticide application and harvest of the crop, according to Environmental Protection Agency labeling requirements.

Some prohibitions that currently apply to non-agricultural workers will be extended to agricultural workers. Examples include operating power-driven wood and metal working machines, meat packing or processing, and roofing, among other.

Meal and rest breaks

A paid 10-minute rest break must be provided for every four hours worked. Employees working more than five hours shall receive a meal period of at least 30 minutes.

Minor work permits

Employers will be required to obtain a minor work permit from the department within three days after hiring a minor. These permits must be posted in a conspicuous place at he work site.

Parental and school authorization

Before employing minors, employers must obtain written permission from the minor's parent and from the school. School authorization is required only during the school year and the school must specify the number of hours (up to the maximum) the student can work.

Variances

Variances will be allowed for weather emergencies. In addition, other variances to hours of work and type of employment also may be granted when they will not:

- harm the minor's health, safety or welfare, and
- harm the minor's school performance.

Variance will not be granted for age of employment, meal and rest breaks, minor work permits, and parent and school authorization.

For more information, or copies of the rules, please contact the Department of Labor and Industries at 1-800-547-8367 or (206) 753-6311.

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Calendar of Events

September 16	**NTA Board of Directors Meeting** Contact: NTA Office (206) 754-0825
September 18	**NTA Annual Meeting of the Membership** Contact: NTA Office (206) 754-0825
September 19	**NTA Board Orientation** Contact: NTA Office (206) 754-0825
September 17-20	**NTA 44th Northwest Turfgrass Conference & Exhibition** Contact: NTA Office (206) 754-0825
October 10	Inland Empire Golf Course Superintendents Association Meeting Contact: IEGCSA Office
October 15	15th Annual Musser Golf Tournament Contact: Norm Whitworth (503) 659-3114
October 21-24	20th Annual Educational Conference of the National Institute on Parks and Grounds Contact: NIPGM (414) 733-2301
November 15-16	17th Annual Conference of Washington Pesticide Consultants Association Contact: Preston Henry (509) 966-7357
November 19	**NTA Board Meeting** Contact: NTA Office (206) 754-0825
December 12-14	Second Annual Pacific Coast Turf and Landscape Conference and Trade Show Contact: Jones and Associates (509) 327-5904
January 22-23 (91)	Fifth Annual Inland Northwest Turf and Landscape Conference and Trade Show Contact: Jones and Associates (509) 327-5904

ADVERTISING/EDITORIAL DEADLINE 15th OF MONTH PRECEDING PUBLICATION

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