



1990 Summer Turfgrass-Fest

The Northwest Turfgrass Association, with the corporation of the WSU Puyallup Research and Extension Center and the High Cedars Golf Club, is sponsoring a **Summer Turfgrass-Fest** June 25 & 26, 1990.

The event is planned to provide the opportunity for friends, colleagues, co-workers and everyone involved with the turfgrass industry to get together to share problems (and solutions); hear about recent research activities; see the "state of the art" in industry equipment demonstrated; and, practice your golf game.

Monday, June 25th, a **Turfgrass Research Golf Tournament** will be held.

Tuesday, June 26th, the annual **Turfgrass Field Day** at the WSU Puyallup Research and Extension Center, Field Laboratory - Farm 5 will be held.

Following the field day there will be a Turf Grounds Maintenance and Irrigation Equipment Display and Demonstration and great luncheon cookout at High Cedars Golf Club. Wally Staatz, owner/manager of High Cedars Golf Club, has donated his club and facilities. Look for registration information for the Summer Turfgrass-Fest in the spring.

1990 Annual Membership And Dues

The NTA is a non-profit corporation founded in 1948 to help all people interested in turfgrass culture. The association now has grown to over 400 people involved in turf facilities development and maintenance at schools, parks, golf courses, cemeteries, parks, sports fields, commercial sites, and home lawns. In addition, lawn spray services, landscape architects, landscape contractors, and equipment and chemical suppliers all participate as members in this organization. Through its many activities, the NTA has benefited all of these people by helping them learn more about their profession. Its annual conference and publications program provide timely and pertinent information specifically aimed at turf culture needs in the Pacific Northwest. In recent years, its focus has broadened to include landscape maintenance in addition to turf culture.

The NTA offers an opportunity to participate shoulder to shoulder with other leading turf professionals

in the Pacific Northwest. Members get:

1. An opportunity to attend the annual conference to listen to outstanding researchers and practitioners and then discuss their findings face to face.

2. A copy of the annual conference **Proceedings**. This publication typically runs 100 to 150 pages and contains approximately 25 different topics as presented by top researchers throughout the Pacific Northwest and the United States. Many of the talks are practically oriented and provide information to take home and apply.

3. An opportunity to exchange ideas and experiences with other turf colleagues in the Pacific Northwest.

4. A first hand look at new equipment and products as displayed at the conference by suppliers from throughout the region and the United States.

5. A quarterly publication, **Turfgrass Topics**, filled with timely information on turf care and other items of interest in our industry. **Turfgrass Topics** also includes advertising by the suppliers with whom you want to do business on a regular basis.

6. An annual **Directory** including a listing of association members along with valuable industry data.

7. A handsome annual **Certificate of Membership**.

8. An active group of elected and appointed colleagues looking out for your interests and those of the industry.

9. An opportunity to support and promote industry-related research.

Annual dues statements were mailed this last month. **If you haven't returned yours yet, get it in soon so you can be listed in the NTA Annual Directory.**

1990 Research And Scholarship Fund Raising Campaign

Bill Griffith, chairperson the NTA Research and Scholarship Fund committee, has announced the kick off of the 1989/1990 Research and Scholarship fund raising campaign.

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

(continued on page 3)

President's Corner

By Dr. William Johnston

"How to Kill the NTA!"

In July 1988, I read an article by James N. Moore in the ASHS Newsletter on how to kill a professional society. His thoughts and mine on this subject have been lying dormant for some time, but with the coming of spring they have sprouted. The following six tips outline many of the ways we can keep the NTA from growing and serving our membership more effectively. The list is not all inclusive and I am sure others could be added.



1) Do not attend the NTA Annual Meeting, especially the business meeting where important issues and policies are discussed and voted upon.

2) Limit any input to destructive comments and criticisms, or do not even participate and then complain that no one listens.

3) Never, never accept an office or task. Or, if unlucky enough to be in a position of responsibility, do not attend meetings, do nothing more than the minimum, and oppose all new ideas.

4) Do not pay your dues on time. That NTA Annual Dues notice of \$75 for regular membership received in January - forget it! Wait till you receive two or three notices and then pay late. Also, an absolute must is do not contribute to any special fund such as the R. L. Goss Turfgrass Endowment Fund - someone else will take care of your share.

5) Do not read Turf Topics and other newsletters. This permits one to complain loudly about a lack of communication.

6) Do not spend any time on recruiting new members into the NTA. Someone else will do that and we are so good anyway that everyone knows about us and wants to join.

My experience as a past member of the Board of Directors and Vice President, and current President has shown me that most NTA members do not have the above faults. Most are willing to serve the NTA in any possible way or the best of their ability. Members I have called upon for help have responded enthusiastically and I gratefully appreciate their willingness to serve. However, from time to time, it is possible that we all are guilty of one or more of the above mentioned faults. We decide that the new bunker we were going to put in for the last three years just has to be built during the NTA Annual Meeting in September. Any one of us may easily decide that we are too busy to serve on the Board of Directors or assist on a committee. We believe that our presence at the annual business meeting is of so little importance that we go shopping or play golf. We know we should contribute to the R. L. Goss Turfgrass Endowment Fund to insure a healthy future for the turfgrass industry in the northwest and to pay Roy back for the time he came out to look at the dying turf when

we "just had to see him - now!", but we are a little short on cash right now and besides only big contributions make a difference.

When we make such judgements we weaken the NTA, for each of us is important to its health, well being, and future growth. The purpose of the NTA is to serve its members and its ability to accomplish this task is in direct proportion to the involvement of its members in the organization. I urge all members to become more involved in your organization in 1990. You will benefit personally and the NTA will certainly benefit from your participation. The NTA really does depend upon you because you are the NTA. In the next issue of Turf Topics I will discuss "How to participate in the NTA". I wish you all a good spring turfgrass season - may your grass always be green (or at least rate a 7).

CORRECTION

The editor apologizes for the misspelling on the 1989-1990 NTA Board Director roster insert in the last issue of the Turfgrass Topics. Jacobson should have been Jacobsen.

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*SREF is the acronym for Slow Release
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Fund Raising *(continued from page 1)*

and effort. We owe our thanks to those who gave 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 of, nor prepared to conduct the research or develop the education programs 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 can financially contribute to industry research and education advancements.

Donation forms will be mailed to members and industry supporters within the next month or so. 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 NTA Conference to Feature Dr. A. J. Turgeon & Dr. Robert Sherman

by Bill Griffith, NTA Program Chairperson

The 1990 NTA 44th Annual Northwest Turfgrass conference educational program is being finalized with many excellent speakers on this year's program. The 1990 conference, to be held at Rippling River Resort, will run from September 17-20, 1990. In addition to our featured speakers, there will be presentations given by Tom Cook, Dr. Gwen Stahnke, Larry Gilhuly, Tim Rhay, Mike Vandecouevering, Crystal Frickner, and others. Many timely topics are planned including; several pertinent pesticide subjects, opportunities for turfgrass education and information, tree fertilization, crowd control and turf recovery, computerized irrigation controller systems, soil testing and interpretation, and a wide variety of others.

This year we are offering two optional Wednesday afternoon sessions, one dealing with sprayer selection and calibration, and the other will be a forum discussion on the use of computers in turf management (bring your favorite IBM programs and software to share). We encourage each of you to plan on attending.

NTA Trade Show Charts New Directions

by Pat Nibler, NTA Trade Show Chairperson

The NTA 44th Annual Northwest Turfgrass Conference trade show will adopt a new approach beginning at his year's event at Rippling River Resort. Membership attendance seems to improve when the convention is sited in a resort setting instead of a metropolitan/ downtown location. Understandably, resorts offer a change of scenery, centralized recreation and meal facilities and family accommodations. In short, a vacation atmosphere. More often than not, however,

resorts do not have large exhibition hall facilities to accommodate a large scale trade show.

Recognizing this, the 1990 trade show at Rippling River is scheduled in conjunction with our Monday night conference kick-off reception and golf tournaments award ceremony rather than as a separate afternoon or evening event. Conference registrants will be treated to the hosted reception including hors d'oeuvres and refreshments, while strolling in a relaxed and casual atmosphere among some forty suppliers and manufacturers' table top displays. The reception/show will begin in the late afternoon and go on into the evening.

During the summer, the Turfgrass-Fest/Field Day will continue to offer a grounds maintenance and irrigation hands-on display and demonstration program, which has become a success in its own right.

The Board of Directors of the NTA would like to extend its gratitude and appreciation for the support, both technical and financial, that is provided by our trade show participants. The majority of the fall conference and Summer Turfgrass-Fest trade show fees are dedicated to the NTA Turfgrass Research/Scholarship Fund.



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ASPA Offers New Turf Referral Service

Listing of turfgrass sod producers are now available upon request from the American Sod Producers Association (ASPA).

While contacts can be obtained by specifying general varieties, ASPA does not have information on specific blends or mixes. Producers can be requested by the following varieties - Bahaigrass, Bentgrass, Bermudagrass, Fine Fescue, Ryegrass, St. Augustinegrass, Tall Fescue and Zoysiagrass. As ASPA members are required to adhere to a strict Code of Ethics, utilizing ASPA producers can ensure turfgrass sod purchasers that they will receive a quality product.

Individuals interested in requesting a listing of ASPA Producers can contact American Sod Producers Association, 1855-A Hicks Road, Rolling Meadows, Illinois 60008 or call 708/705-9898. Requests should specify geographic area(s) and varieties of turfgrass individuals are interested in purchasing.

USGA Turfgrass Information On File

by Peter Cookingham, TGIC Manager
TGIF Manager

Throughout the business world, technology continues to alter the way we act and produce. Car phones, FAX machines, and personal computers sprout up

everywhere. Seemingly, a library could be one of the last places to feel the influence of "the electronic age."

But not so. In fact, libraries have long been recognized as a "natural" candidate for automation. Much effort is currently underway to use this "new technology" to help users of libraries, and the world of turf culture is no exception.

Beginning in 1982, the USGA Turfgrass Research Committee identified a basic need to inventory and classify existing turf literature as it embarked on a long-term research program to reduce turfgrass water and maintenance requirements. Much research has been conducted over many years on a wide range of issues in turf culture. How do you quickly and comprehensively identify such work?

The MSU Libraries was chosen to be the home for this project primarily because of the presence of the O. J. Noer Memorial Turfgrass Collection at MSU. This collection began over 20 years ago, and with the continuing support of the O. J. Noer foundation has grown to become one of the best of its kind in the world. Originally based on the personal literature collection of the late turf agronomist O. J. Noer, materials continue to be donated and purchased.

The role of the Turfgrass Information File: Owning literature and having it easily accessible are two different things, however. The link between the prospective user and the collection itself is the role of the USGA Turfgrass Information File. USGA TGIF is an

(continued on page 5)



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Turf Referral *(continued from page 4)*

electronic index file to the turf literature, or *bibliographic database* you need access to the "raw materials," of such databases: the published literature. At MSU, we attempt to collect everything published on turf, index and abstract the material, and make it available through mail, telephone, or direct computer-to-computer access.

Many bibliographic databases exist in a wide range of academic and business areas. At present over 2,000 are commercially available; some small like USGA TGIF, while others in far more general areas contain millions of records. Used in the past primarily by academics, the tools are increasingly being exploited by practitioners, following the lead of the medical and legal professions. But no one else worries about turf, and only turf.

Under construction since 1984, USGA TGIF currently has over 16,600 records in it, and continues to grow daily. Current publications relevant to turf research or turf culture are monitored for items which relate to turf. Each is indexed and abstracted, as necessary. We intend to "keep current" with materials as they are produced today and into the future, and also to work back into time to make the wealth of the past more accessible. Ever wonder how you would keep track of all the articles or presentations you saw or heard or read? Over a span of years this becomes a sizable amount of remembering to try and do, and numerous professionals maintain their own indexing files to keep the "good stuff" organized and accessible. The computer is an ideal way to do this organizing. At the MSU Libraries, we use the computer to organize access to the mass of published material in turf science; thus USGA TGIF. TGIF can serve as a collective index to your materials as well as ours.

What can it do?

1. Act as an index to guide you to sources that may contain the information that you seek.
2. Identify names, products, researchers, cultivars, etc., thus serving as a reference source.
3. Function as a textbook, by overviewing (but not synthesizing) published material on a given topic.
4. Sometimes it can locate a specific piece of information and thus "answer a question."
5. Act as a clearinghouse for the cumulated published experience of turf research and management.

USGA TGIF provides us the ability to identify relevant works on a given topic. The Noer collection provides a known location for the majority of those works. The two elements lay complimentary and mutually-supportive roles.

How can you use USGA TGIF? Several alternatives are possible, depending on your needs and computer capabilities.

1. If you don't have a microcomputer, you can call or write us at MSU, describe the subject or objective of your search, and we will take it from there. Search results will be mailed to you, generally within 48 hours. The search results will consist of a customized

bibliography of items relating to your topics, including abstracts in most cases.

2. If you have access to an IBM-PC (or compatible) with a modem, you can sign up to conduct your own searches via your machine. You can thus directly construct a search and download the results to your computer. This is possible 7 days a week, 18 hours per day.

In an effort to make USGA TGIF as self-supporting as possible, a fee schedule has been established relating to services. Subscribers sign up on an annual basis, and can search the database directly (as described above) or receive searches via mail at reduced rates. Non-subscribers are billed on a pay-as-you-go basis for searches and other services.

What if you need or want an entire article that you have identified via a search, but do not have access to yourself? We can provide document delivery in many cases, on a cost recovery basis, using mail, overnight deliver, or fax, as necessary.

What kinds of materials are present in USGA TGIF? Included are journal articles reporting the results of original research (e.g. *Crop Science, Agronomy Journal, Plant Disease*, etc.), state-by-state annual reports (*Kentucky Turfgrass Research*, etc.), conference

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Turf Referral *(continued from page 5)*

proceedings (*Virginia Turfgrass conference, Michigan Turfgrass Conference, Northwest Turfgrass Conference, etc.*), professional magazines (*USGA Green Section Record, TurfNews, Golf Course Management, Greenmaster, etc.*), trade publications (*Grounds Maintenance, SportsTurf, ALA, etc.*), and newsletters (*The Grass Roots, The Florida Green, etc.*). Add in theses and dissertations, special reports, books, films, software, extension publications, etc., and USGA TGIF includes a wide range of sources.

How can we search this mass of material to try and identify only those materials which we want?

USGA TGIF can be searched by subject or subjects, author or authors, year of publication or a range of years (e.g. 1985-1988 only), etc. each alone or in combination with any other factor which is present in our TGIF record. We thus could search and identify all published (and acquired) research on:

1. Bluegrass Billbug control.
2. Comparative quality evaluations of tall fescue cultivars.
3. Review articles on white grub control alternatives.
4. All articles written by Dr. James Beard on heat stress.
5. Bahiagrass control in Centipedegrass sod,
6. Pendimethalin effectiveness.

Searches will be successful to the extent that the subject has been discussed in the published literature of turf agronomy. If not; then no results. Several other caveats are in order, to:

1. USGA TFIG is still under construction; it is big and getting bigger, but much of the older material remains to be processed. In other words, just because it isn't in TGIF (yet) doesn't mean the work wasn't done (or published).
2. Our primary focus is on turf culture. Related materials on turf equipment, business operation issues, marketing, etc. will probably not be present in USGA TGIF.
3. We don't evaluate the contents of what is published. Our role is not to filter; it is to transmit. As the information user, you are the professional who must evaluate the content of any report of conclusion. There are contradictory materials present in the database, just as there are contradictory opinions in the real world.

What does the USGA Turfgrass Information File do? It uses the computer as a tool to provide access to the published literature of turf science. We intend to continue to make this access easier, quicker, cheaper, and more efficient, based on industry needs and available technology.

To obtain complete information regarding the USGA Turfgrass Information File and its associated services, call or write: **Turfgrass Information Center, W-212 Main Library, Michigan State University Libraries, East Lansing, MI 48824-1048; (517) 353-7209.**

We hope to hear from you, and assist with your information-seeking needs.

Turf - More than Aesthetics And Sports

by J. F. Shoulders, Professor Emeritus, Agronomy
Virginia Polytechnic Institute and State University

My objective is to broaden your appreciation of turf as a high priority need in the life style of people, and to encourage you to inform your clients and the general public of the important role of turf in the environment and its beneficial effects.

Recently the turf industry has been challenged by certain individuals and by the news media. These challenges have increased the awareness of those in our industry of the continuing need to always do the best job possible with minimum risk to our clientele, to the general public, to our employees, to ourselves, and to the environment.

We must provide answers that assure our clientele and the public that any risks involved are acceptable and justified by the benefits provided by turf.

It is my purpose to encourage turf professionals to be constantly aware of the broad values of turf as we go about our daily routine. These broad values include such categories as reducing soil loss by water and wind erosion, temperature modification, water purification, enhancement of property values, and other times which I will discuss. In my opinion, enhancing the public's understanding of the total value of turfgrass in everyday living and in environmental improvement is among the highest priorities for our industry at the present time.

Before discussing these less emphasized values of turf, let us review briefly some of the development of the turfgrass industry and explore some of the reasons we are faced with the present day challenges.

When we analyze the use of turfgrass in today's culture, turf can be placed into three general categories - ornamental, recreational, and functional.

We are most familiar with the first two - *ornamental*, which includes lawns, formal gardens, grounds, and general grassed areas where turf is used primarily to beautify and serve as a foundation planting to enhance other landscape plants and structures (including statues and buildings); and, *recreational*, which includes turf for sports areas, such as playgrounds, golf courses, parks, athletic fields, horse race courses, and ski slopes.

The *functional* category comes to mind less frequently and it is in this area that we must place more emphasis in the immediate future. This is the area that touches every person in some manner and enhances their quality of life. This includes such items as dust and mud reduction, air purification, water purification, climate modification, glare reduction, etc.

There are logical reasons for our neglect of the functional are: Turf management was not recognized as an important segment of agriculture until lately when compared to crops such as corn, cotton, tobacco, small grains, even forestry. These crops provided immediate food, clothing, shelter, or cash and consequently were given a higher priority than turf.

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IPM And The Golf Course Superintendent

by Christine Casey

Insect, disease and weed problems are nothing new to the golf course superintendent, and neither are the problems that often accompany the pesticides used to control them. Diminishing effectiveness, increasing costs, and safety considerations are legitimate concerns surrounding pesticide usage. In response, many agriculture professionals have turned to an alternative pest control strategy called integrated pest management (IPM). In New Jersey, IPM programs are developed and implemented by IPM agents, county agricultural agents, and specialists who work for Rutgers Cooperative Extension. While New Jersey vegetable and tree fruit growers have had IPM programs for many years, ornamentals and turf IPM is a relatively new program in our state. IPM programs often use pesticides, but the emphasis is put on keeping pests at low levels through the use of other pest control strategies so that pesticides are used less often and serious pest problems are prevented. IPM also differs from traditional pest control in that it employs a variety of control strategies, rather than relying on a single strategy (usually pesticides). Some of the different pest control tactics used in an IPM program include:

Monitoring

Traditional pest control programs have been based on the calendar - sprays were applied at certain times of the year, regardless of whether the pest was actually present. In an IPM program, regular plant inspections (about every two weeks) are an essential way to keep track of changes in pest problems. In addition to plant inspections, insects are monitored through the use of insect traps. Black light traps catch insects which are attracted to light, while another type of trap, the pheromone trap, uses a synthetic sex attractant similar to that emitted by the female to attract the male for mating. These traps can indicate when an insect is first present in an area, and how its population is changing. Another useful monitoring tool for the turf professional is the diagnostic test kits which have been developed for brown patch, dollar spot, and pythium. These enable superintendents to make a positive disease identification in less than half an hour. Based on monitoring, pest control decision can be made according to what pests are known to be present, not on what is through to be present. regular monitoring can prevent pest problems because potentially serious infestations can be discovered while they are still minor. In addition, when plants are inspected on a regular basis, it is possible to keep track of biological control agents such as ladybird beetles or scale predators when plants are being inspected regularly. Monitoring alerts the superintendents to previously undetected pest problems, so plant and turf quality improve.

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Pruning Guide

The following is a pruning guide adapted from the September 1989 "Dundee Leaflet" newsletter by Dundee Nursery and Landscaping, and the Minnesota Extension Service publication "Pruning Trees and Shrubs" (AG-FO-0628) by Mervin C. Eisel, Extension Horticulturist.

Common questions asked at the Extension office and at local nurseries is when to prune a particular kind of shrub or tree. Hopefully this guide will aid in knowing the correct time of year to prune for optimum effect. Any dead, diseased, or damaged branches can be pruned as soon as they are noticed even though the time of year may be less than desirable for pruning.

(Note: Refer to the "key" below to interpret the pruning chart)

KEY:

1 - WINTER: December, January, February. This helps prevent possible diseases and insect infestations. "Bleeding" of sap doesn't hurt trees.

2 - SPRING: before growth starts. Usually because flowers on new wood or because plant is grown for foliage effect.

3 - EARLY IN GROWING SEASON; generally May - early June.

4 - DURING GROWING SEASON; pines should be pruned before candles (new growth) have fully opened and become woody. Usually in early May.

5 - RIGHT AFTER FLOWERING: usually done because plant flowers on old wood.

6 - SUMMER: best time is when it is not rainy or humid. Locust should be done after July 15.

7 - FALL: best when plant has lost its leaves for the year.

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Almond, Flowering	5	Elder	2	Plum (fruit tree)	1
Apple	1	Elm	1	Plum (ornamental)	5
Apricot	1,5	Euonymus,		Poplar	1,6,7
Arborvitae	3	(Burningbush)	2	Potentilla	2
Ash	1,6,7	Falsespirea	2	Privet	5
Aspen	1,6,7	Fir	2	Rhododendron	5
Azaleas	5	Forsythia	5	Rugosa (shrub) rose	2,5
Barberry	2	Ginkgo	2	Serviceberry	5
Birch	1,6,7	Hackberry	1	Smoketree	2
Boxwood	3	Hawthorn	1	Snowberry	2
Buckeye	2,7	Hemlock	3	Spirea (Anthony	
Buckthorn	2	Honeylocust	1,6	Waterer; Goldflame;	
Cherry, Canada Red	1,5	Honeysuckle	5	Curly Leaf; Daphne;	
Cherry, Meteor;		Hydrangea	2	Froebeli)	2
North Star	1,2	Ironwood	1,2,6	Spirea (Arguta: Fairy	
Cherry, Nanking	5	Juniper	3	Queen; Snowmound;	
Cherry Plum	1,2	Lilac	5	Prunifolia;	
Chokeberry	5	Linden	1,6,7	Vanhoutte; Thunbergi)	5
Chokecherry	5	Magnolia	5	Spruce	2
Coffeetree,		Maple	1,6	Sumac	2
Kentucky	1,2,7	Mockorange	2	Tamarack	2
Coralberry	2	Mountain Ash	1	Tamarix	2
Corktree	1	Ninebark	2	Viburnum	5
Cotoneaster	1	Oak	1,7	Walnut	6
Crabapple	1	Olive, Russian	1	Weigela	2
Curant, Alpine	2	Pear	1	Willow	1,6,7
Deutzia	5	Peashrub	5	Winterberry	2
Dogwood	2	Pine	4	Yew	3

Golf Course Operations Must Supply Information About Hazardous Chemicals

Congress recently approved the largest appropriation to date — \$27 million for fiscal 1990 — for the U.S. Environmental Protection Agency to implement the federal right-to-know act, specifically to encourage local emergency planning. Congress also has ordered the Federal Emergency Management Agency (FEMA) to prepare, by March 31, a study on the major threats facing communities and local emergency management coordinators.

In 1986, the U.S. Congress enacted the Emergency Planning and Community Right-To-Know Act (EPCRA) as a response to growing concerns about the effects of chemical releases on communities. The act (1) supports emergency planning efforts at the state and local levels, (2) provides citizens and local governments with information concerning potential chemical hazards present in their communities and (3) establishes enforcement procedures and civil, administrative and criminal penalties for non-compliance.

Subtitle A establishes the framework for emergency planning by state and local governments by calling for the creation of state emergency response commissions and local emergency planning committees. These local panels are designed to work on emergency response plans in cooperation with representatives of facilities — including golf courses — covered by the law.

Subtitle B, which was designed to provide information to appropriate local, state and federal officials on the type, amount, location, use, disposal and release of chemicals, includes three reporting provisions:

Section 311 applies to all facilities, such as golf courses, that are subject to the Occupational Safety and Health Act of 1970 and subsequent OSHA regulations. The owner or operator of a golf facility must submit material safety data sheets (MSDSs) or a list of the chemicals for which the facility is required to keep MSDSs to state emergency response commissions and local emergency planning committees and fire departments.

Updates are due within three months after OSHA regulations require the owner/operator to prepare or have available an MSDS for a specific hazardous chemical. A revised MSDS must be submitted for significant new information regarding a chemical for which an MSDS was previously submitted.

Also under Section 311, EPA can establish threshold quantities for hazardous chemicals, so that no reporting is required if a facility has a below-threshold amount of a hazardous chemical.

Section 312 requires facilities covered by Section 311 to submit a chemical inventory form annually by March 1. The inventory forms must contain an estimate of the maximum amount of the hazardous chemicals present at the facility during the preceding year, an estimate of the average daily amount of hazardous chemicals at the facility and the location of these chemicals at the facility.

Section 312 calls for two reporting "tiers." Tier I requires only general information on the amount and location of hazardous chemicals at the facility. Tier II information, which need not be submitted unless requested by the state commission or the local planning committee or fire department, requires more detailed information about each chemical.

Section 313 requires EPA to establish an inventory of toxic chemical emissions from facilities that meet certain criteria. The information will be used to establish a computerized national database accessible by the general public.

Under Section 313, owners and operators of certain facilities must complete a toxic chemical release form for specified chemicals, reflecting releases during the preceding calendar year, to be submitted to EPA and state officials annually on or before July 1.

Facilities that use more than 10,000 pounds of a single listed toxic chemical or that manufacture or process more than 25,000 pounds total of any of the listed chemicals must submit toxic chemical release forms. These forms request information on the maximum amount present at the location; treatment and disposal methods; and annual quantity released into the environment for each listed chemical or chemical category.

The initial list of toxic chemicals subject to reporting requirements consists of 329 entries, including 20 categories of chemicals. EPA's administrator may add or delete chemicals on the list based upon an agency determination of health or environmental hazards. State governors and the public may petition the administrator to add to or delete from the list.

Title III of EPCRA outlines trade secret protection and enforcement procedures:

Section 322 applies to trade secret claims under reporting requirements for emergency planning and Sections 311, 312 and 313. Even if specific chemical identity of an extremely hazardous substance or chemical is allowed to be withheld as a trade secret, the generic class or category of the chemical must be provided.]

Section 323 requires that chemical information withheld from the public as a trade secret must be made available to health professionals for diagnostic purposes and emergency assessment activities. In these cases, the person receiving the information must be willing to sign a confidentiality agreement with the facility.

Section 325 provides for enforcement procedures and penalties as follows:

- civil penalties for owner/operators not complying with emergency planning requirements
- civil, administrative and criminal penalties for owner/operators not complying with emergency notification requirements following the release of a listed hazardous substance
- civil and administrative penalties for owner/operators not complying with reporting requirements in Sections 311, 312, 313
- civil and administrative penalties for trade secret claims that are ruled frivolous

- criminal penalties for disclosure of trade secret information.

How EPCRA Works In Washington

As a response to growing concerns about the effects of chemical releases on communities, the U.S. Congress enacted the Emergency Planning and Community Right-To-Know Act (EPCRA) in 1986. The act supports state and local emergency planning efforts and provides citizens and local governments with information concerning potential chemical hazards present in their communities by requiring reports from businesses — **including golf courses** — that deal with hazardous chemicals.

The state of Washington has two separate laws with community right-to-know provisions. The 1987 Hazardous Substance Information Act, administered by the state Department of Ecology, established an outreach program to facilitate access to existing information on hazardous substances within a community. The Worker and Community Right-To-Know Act implements the provisions of Title III. It also requires the state Department of Labor and Industries, which administers the law, to develop educational material and public service announcement. These materials are sent to each county health department for public distribution.

Golf course operations must fulfill the federal reporting and notification requirements for material safety data sheets (MSDSs) and hazardous chemical lists.

The Department of Ecology's office of hazardous substance information and education is responsible for providing the community and public health or safety organizations with the following information:

- point and non-point air and water emissions
- extremely hazardous wastes, moderate risk wastes and dangerous wastes (as defined by the Department of Ecology) that are produced, used, stored, transported from or disposed of by any facility
- data on acute and chronic health and environmental effects of hazardous chemicals
- data on government and commercial pesticide use
- facility compliance history.

The law also requires public educational programs including health hazard information, safe handling and disposal of hazardous household substances, guidelines to aid counties in developing and implementing a hazardous household substance program and a technical resource center on hazardous substance management.

The state Department of Labor and Industries is responsible for developing translations of written hazard communication programs and MSDSs into any of the five most common foreign languages in the workplace, and distributing them to employers or the public.

Community Right-To-Know Contacts

For emergency release notification, call 800/262-5990.

For general information or document submissions, call the Division of Emergency Management at 206/438-

7395. For emergency planning notification, call the Emergency Response Commission at 206/753-5255.

Submit follow-up emergency release notification, MSDSs, chemical inventories and annual toxic chemical release forms to Chairman, State Emergency Response Commission, 9th and Columbia Building, Mail Stop GH-51, Olympia, WA 98504.

Source: GCSAA

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SUMMER TURFGRASS-FEST

Turf Aesthetics *(continued from page 6)*

Grass was taken for granted until the late 19th and early 20th century. Pastures were a "last resort" crop. When nothing else would grow, the land was allowed to return to grass (and unto the climax vegetation of the area). "Grass is the forgiveness of nature - her constant benediction" wrote Senator John James Ingalls of Kansas in 1872.

Some writers have suggested that the home lawn is a "living fossil" that has survived from the time when wild animals roamed the forest. Open grassed areas around the house provided protection for both people and animals as well as grazing for farm animals. As a farm boy, I can attest to the fact that the lawn around our house was mowed almost, if not as, frequently by horses or sometimes by sheep as it was cut by scythe or by an old reel mower that was very hard for a boy of six to ten years to push.

It required more than 50 years and the efforts of a few farsighted individuals to break through the general indifference to turf.

The first appropriation from the federal government in which funds for turf research were included was in 1901. The earliest turf research in a state - for which there is a record - was in 1890 in Rhode Island. The earliest recorded turf research in Virginia was in the 1910-1915 period.

I would characterize the development of turf in Virginia and in most of the U. S. as follows:

Before 1949 - indifference and secrecy. The decade of the 50's - awakening and search for information. The decade of the 60's - professionalism and growth. The decade of the 70's - maturing of research and educational programs, development of strong segments within the industry such as the golf course and sod production segments, and the emergency of the lawn service segment.

In the present decade of the 80's, we have seen tremendous growth in sod production, lawn service and the emergency of the movement for accelerated athletic field improvement.

The increased interest that developed during the 50's created the second challenge for the turf industry - that of providing technical information needed for the production and management of turfgrass.

For the past 25 years, the turf industry has done an excellent job of dealing with problems related to turf production and quality. Research and educational programs have provided information in every segment of the industry. Industry has supplied the products and equipment necessary to produce and maintain quality turf.

Although the need for additional information and techniques will continue, and the equipment and tools needed to do the job will continue to improve, as an industry we have excelled in developing the technical knowledge, skills, and techniques necessary to produce quality turf for all uses.

We have done this through cooperative efforts involving all segments of the industry: as professionals and members of turf organizations, with universities and

colleges through research, teaching and extension, with industry and all that is involved in the development and supply of products and equipment, and with federal and state government through programs which provide knowledge and promote the smooth flow of commerce. All have participated in the advancement of the Turfgrass Industry.

The advances we have made over the past ten to twenty years have brought us face-to-face with our current - and very important - challenge: changing public opinion about turf and its often overlooked advantages. Public recognition of these attributes should be an important factor in reinforcing the cost-benefit ratio as we deal with the pesticide issue.

People in general still think of turf as being used primarily for beautification, ornamental, or as sports turf - recreational. Important as these uses are for our mental attitude and our recreational/leisure activities, many people still regard turf as having a low priority whenever limitations on the use of resources are necessary. We have periodically faced restrictions on the use of water for irrigation and have gone through periods within the past fifteen years when the use of fuel and fertilizer for turf production have been questioned. I am sure these issues will surface again. The turf industry must develop a sound basis from which to compete for essential resources. This and the subject of safe pesticide use give the turf industry ample reasons for making whatever effort is needed to inform the public of the total uses and advantages of turf.

The following are twelve attributes, or advantages, of turf which are frequently overlooked.

1. Water erosion. In a Missouri Experiment Station study of 14 years, with an average rainfall of 40.4 inches, and on a slope of 4 feet per 100, almost 42 tons of soil were lost from a plowed field compared to only 1/3 ton (680) from a bluegrass turf. There is more information available on soil erosion control than almost any of the other areas.

2. Wind erosion. Again, turf protects the soil. Soil loss from under a good turf is negligible.

3. Reduction of water runoff and flooding. Turf retains much water. If the infiltration rate is 1 inch per hour, 27,254 gallons of water are retained per acre. The value of turf in water runoff control has been observed many times as areas were developed. Following the hard surfacing of parking lots and streets and the construction of buildings, streams that rarely flooded before development were inadequate to carry the runoff following a moderate to heavy rain.

4. Temperature reduction. Dr. H. J. Carew of Michigan State pointed out that the cooling effect of one acre of grass is equal to that of a 70 ton air conditioner. Also in an Alabama study on a hot day when

(continued on page 10)

Turf Aesthetics *(continued from page 9)*

temperatures were 110° F at the surface of natural turf, it exceeded 150° F at the artificial turf surface, an increase of 40° F.

George Tomas has reported a temperature of 160° F over artificial turf on a day when air temperature was 90° F. Similar comparisons could be made between blacktop and turf.

5. Dust control. Little dust comes from well turfed areas compared to bare areas. In fact, grass blades trap dust particles thus reducing the dust remaining in the air.

6. Mud abatement. Little mud clings to feet or is brought into the house after a rain from a well turfed lawn. This was vividly etched on my memory when we moved into a new home in Blacksburg with three children under the years of age, before the lawn was established. After a rain - there was mud!

7. Water purification. Turf is used in the food processing industry to reduce the biological oxygen demand level of waste water before discharge into natural streams or waterways. There are many other areas in which water is made cleaner by running over grass areas.

8. Glare reduction. Turf reduces glare around dwellings, in commercial areas, along highways.

9. Air quality improvement. Turf releases oxygen and uses carbon dioxide. O. M. Scott's lawn care magazine pointed out that the turf in a 50' by 50' lawn, if well maintained, yields enough oxygen to supply a family of four for one day. Turf also is a user of CO₂ which reduces the rate at which carbon dioxide is increasing in the atmosphere.

10. Fewer injuries on natural turf. Well maintained and managed turf reduces the number of injuries to players when compared to artificial turf, poorly maintained natural turf surfaces, or paved playing surfaces. There are several studies which show that a high quality natural turf playing surface is a safer surface on which to lay contact sports such as football. These studies and the preferences of many players reinforce the current efforts of the National Sports Turf Council to upgrade the quality of natural turf athletic fields.

11. Increases property values. High quality turf used in an attractive landscape plan increases property values and enhances commercial appeal. Some authorities have estimated that a high quality lawn in a well landscaped setting adds from 5 to 15% to the value of a residence. In a survey in Sioux Falls, South Dakota, it was reported that 83% of those responding to a survey placed external appearance as their first priority in selecting an apartment complex in which to live. How much influence does an attractive community with good residential and commercial lawns have in attracting new industry?

12. Highway safety. Turf seems to make highways safer by reducing glare, and otherwise helping to reduce driver fatigue.

There are other attributes of turf that I could include, some undoubtedly more significant than those I have listed. However, these give you an idea of the functional areas of turfgrass use in which I think we must place considerable emphasis, now and for the foreseeable future.

We must maintain and improve the public image of our industry. We must continue to improve our performance of routine management practices. We must at all times be professional in our approach.

In my lifetime we have changed from a rural society where most people understand plants to an urban society in which fewer and fewer people understand the basic requirements for plant survival and growth.

This change in peoples understanding is one of the factors we face as we strive to enhance the image of the turfgrass industry and its value in today's lifestyle.

Throughout the development and history of turf, we have successfully met and conquered challenges. This emerging challenge is no different. We can and will meet it successfully.

IPM *(continued from page 7)*

In addition to plant monitoring, environmental monitoring is also important. This enables the superintendent to stay on top of environmental conditions which favor a particular disease or insect.

Cultural Conditions

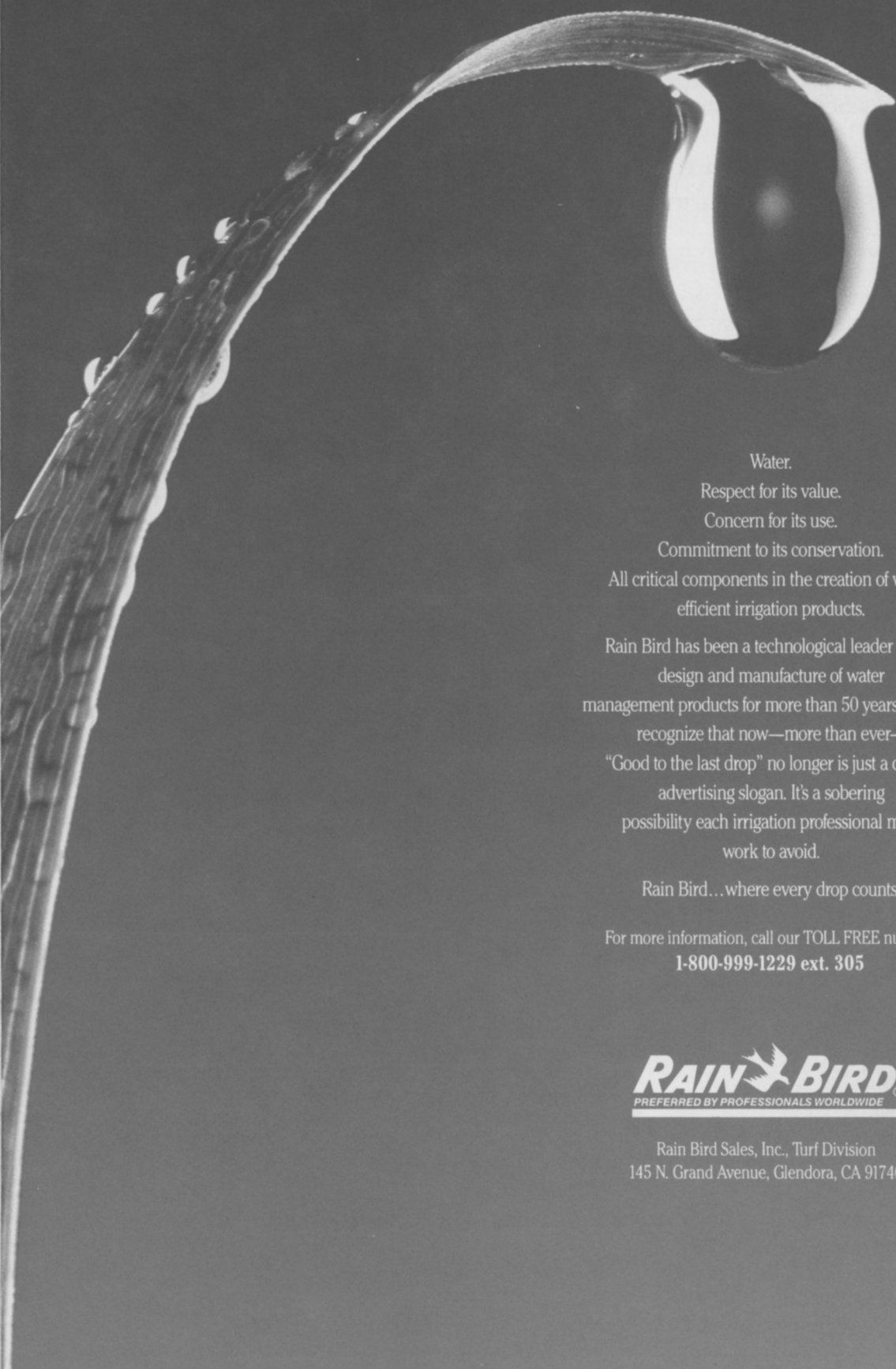
Golf course superintendents are aware of the role that temperature, humidity, irrigation, and fertilization can play in the development of turf diseases. While the first two cannot be controlled, the latter two can be manipulated to help reduce the incidence of disease. Also, some of the pest problems seen on the golf course are the result of plant stress from either poor soil conditions, poor plant quality, or improper plant siting (wrong amount of sun, soil moisture, etc.). Regular soil tests can provide a great deal of useful information about plant growing conditions which the superintendent can use to prevent pest problems.

Physical Control

Many pest problems can be prevented via physical means. A weekly washing with the hose will remove such common pests as aphids, while other insect or disease-infected plant parts can be removed by pruning. Barriers such as burlap tree bands can also be effective. Insects such as gypsy moth caterpillars and elm leaf beetles will hide under the bands during the day, where they can be destroyed. In addition, physical barriers such as mulch can be used to reduce weed levels around landscape plants. Mulch has the additional benefit of increasing soil moisture retention.

(continued on page 12)

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Biological Control

There are many naturally-occurring predators and parasites of plant pests. These include the ladybird beetle and the preying mantis, while an example of an introduced parasite is milky spore disease for Japanese beetle grubs. There are many others which are commonly present, but are so small that they are seldom seen. When the use of pesticides is limited, natural predators and parasites are encouraged since most pesticides will kill these beneficial organisms.

Resistant Plant Varieties

Many landscape plants and turf varieties are naturally resistant or have been bred to be resistant to insects or diseases. Use of these plants can have a positive effect in the reduction of pest problems. Breeding programs at Rutgers are now focusing on the introduction of endophytes into turf varieties. An endophyte is a fungus which is found between the cells of the turfgrass plant and helps to reduce feeding by some turf insects. It is not pathogenic to the turf.

Pesticides

As mentioned earlier, pesticides are part of an IPM program, but they are used differently than in a conventional pest control program. The plant monitoring, which is part of an IPM program, enables the superintendent to pinpoint just those areas of the course where a problem is serious enough to warrant spraying. These spot sprays can represent a great savings in the amount of pesticide applied to a property when compared with a conventional program in which all plants would be sprayed. When pesticides are necessary, an IPM program makes their use more efficient since monitoring lets the superintendent know exactly what the pest is and at what time to apply the pesticide so it will be most effective.

Landscape IPM programs have shown great potential, having reduced pesticide usage up to 70%, while improving plant quality. When monitoring costs are included, this corresponds to a cost reduction of 20-30%. The notification laws which will go into effect this year have created an increased interest among golf course superintendents for information on IPM. Additionally, last summer's drought put a heavy stress on golf course landscapes, so superintendents can expect additional pest problems on their landscape plants.

For more information on IPM, contact your county agriculture agent.

Source: The Greenside

Identification of Soil Types

The United States Department of Agriculture defines soil separates as having the following diameters in millimeters: very coarse sand 2 to 1; coarse sand 1 to 0.50; medium sand 0.50 to 0.25; fine sand 0.25 to 0.10; very fine sand 0.10 to .05; silt .05 to .002; and clay below .002 millimeter.

Sand is loose and single grained. The individual grains can be seen or felt. Squeezed in the hand when dry, it will fall apart when pressure is released. Squeezed when moist, it still forms a cast, but will crumble.

A **Sandy Loam** is a soil containing mostly sand but which has enough silt and clay to make it somewhat coherent. Squeezed when dry, it will form a cast which will fall apart; but is squeezed when moist, a cast can be formed that will bear careful handling without crumbling.

A **Loam** is a soil having a mixture of the different grades of sand, silt, and clay in such proportion that the characteristics of no one predominate. Squeezed when dry, it will form a cast that will bear careful handling, while the cast formed by squeezing the moist soil can be handled quite freely without crumbling.

A **Silt Loam** is a soil having a moderate amount of the fine grades of sand and only a small amount of clay over half of the particles being of the size called "silt". When dry, it may appear quite cloddy, but the lumps can be readily broken; and when pulverized, it feels smooth, soft, and floury. When wet, the soil readily runs together. Either dry or moist, it will form casts that can be freely handled without breaking.

A **Clay Loam** is fine-textured which usually breaks into clods or lumps that are hard when dry. When the moist soil is pinched between the thumb and finger, it will form a thin "ribbon" which will break barely sustaining its own weight. The moist soil is elastic and will form a cast that will bear much handling. When kneaded in the hand, it does not crumble easily.

A **Clay** is a fine-textured soil that usually forms very hard lumps or clods when dry and is quite elastic and usually sticky when wet. When the moist soil is pinched out between the thumb and finger, it will form a long, flexible "ribbon".

Source: Turf Tales/September



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Lawn and Sports Turf Statistics - USA

The total turfgrass area in the United States is estimated to be 25,000,000 to 30,000,000 acres (size of the 5 New England states), with 81% of this lawns (over 20,000,000 acres.) Municipal, county and city parks have close to 1,000,000 acres of turf.

In a thick lawn, there are 6 turfgrass plants in each square inch, 850 turf plants in a square foot and about 8 million in an average lawn of 10,000 square feet.

Turfgrass is considered to be a \$25 billion plus per year industry in the United States. It is estimated that 500,000 people make their living directly from the care and maintenance of turf. The sale of lawn care items is estimated at \$4 billion a year, nearly 1/3 of the total amount spent on gardening.

Surveys show that a well maintained and designed landscape adds 15% to the selling price of a home. Recovery value is 100% to 200% for landscape improvement compared to an investment in new deck or patio which have recovery values of 40%-70%. Well designed and maintained landscapes add 60% to commercial property value.

Undesirable noise levels can be reduced 20-30% by grassed areas which absorb sounds.

Lawns are important in reducing temperatures and can be 30 degrees Fahrenheit cooler than asphalt and 10-14% cooler than bare soil.

A turf area 50'x50' produces enough oxygen to meet the needs of a family of four.

Grasses trap much of an estimated 12 million tons of dust and dirt released annually into the atmosphere.

An acre of grass will absorb hundreds of pounds of sulfur dioxide during a year.

Healthy lawns absorb rainfall 6 times more effectively than a wheat field and 4 times better than a hay field.

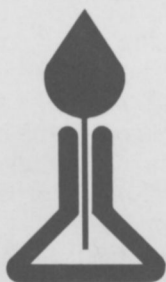
One single grass plant can have 387 miles of roots.

Most of the 58 million children enrolled in public and private schools participate in physical education. It is important to have their playing surfaces well maintained and resilient to help minimize injuries.

20,200,000 golfers play 445 million rounds of golf a year in the United States.

It is recommended that 6 acres of publicly owned land be maintained as communal recreational facilities (not including golf courses) for every 1,000 people.

Source: The Lawn Institute



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What Every Turf Manager Needs To Know About Soil Testing

by S. J. Donahue, Virginia Tech.

A healthy, vigorous turf is the primary goal of a good turf manager. And one of the most important management practices for establishing and maintaining a vigorous turf is soil testing.

There are several reasons for testing soil. First, soil testing assists in determining fertilizer needs, by indicating both how much fertilizer is needed and what kind of fertilizer to apply. Second, soil testing tells us how much lime is needed to correct soil acidity, as well as what kind of limestone to apply (e.g., dolomitic, calcitic, regular agricultural lime). Third, soil testing helps to detect potential minor element needs, both directly, through minor element testing, and indirectly through the soil pH test. Fourth, soil testing assists in identifying causes of poor turf growth. If the problem is one of poor plant nutrition, the soil test will help indicate this. In some cases, factors other than inadequate plant nutrition such as disease, insects, etc. are responsible for the poor plant growth. However, a soil test in this case will help eliminate nutrition as the cause of the poor growth, thereby narrowing down the real cause of the problem. Fifth, soil testing enables one to utilize research in turf production. Researchers have developed a considerable amount of information on turf growth and management. Soil test recommendations are based on these research findings. Therefore, one can utilize this research in turf production through soil testing. Sixth, soil testing helps to protect your investment. When one considers the cost in labor and materials that go into establishing and/or maintaining a good turf the importance of soil testing for maintaining adequate fertility levels and ensuring good turf growth to protect the investment becomes apparent. Soil Testing is one simple, straightforward way to protect your investment.

From the above, it can be seen that soil testing is an important agronomic tool for a turf manager. The question today is not "why" test soil, but rather "how" to take a good meaningful soil sample. Sampling is perhaps the most important part of a soil testing program. When one considers that a two-pound soil sample must represent, on the average, 25-50 tons of soil in the area being sampled (there are 25-50 tons of soil in 1,000 to 2,000 square feet from the surface of the soil down to the six inch depth) the importance of collecting a good soil sample becomes apparent.

To begin the sampling process, the first step is to separate the turf to be sampled into uniform areas, i.e., areas that have been fertilized and limed the same and areas that have the same soil type. A separate soil sample is required from each uniform area in order to obtain an accurate representation of the fertility status of that areas. As an example, the lawn around a house might be separated into two areas for sampling purposes, the front lawn and the back lawn, for situations where the front lawn received more attention (i.e., more

fertilizer, lime, and general care) than the back lawn. Tees would be considered apart from greens and fairways.

Within each uniform area, 10 or more subsamples or soil "cores" should be collected in a random fashion. Care should be taken to avoid flower borders, etc. which might have a fertility level quite different than that from the general turf area. In regard to sampling depth, an established turf should be sampled from the surface to the 2-4 inch depth. The reason for this is because phosphate, potash, and lime, when surface applied, move downward very little in the soil. In addition, most of the grass roots feed within this area. Sampling at this depth will give a reliable indication of the fertility status of the soil as the plant sees it. When establishing a new turf, the sample should be collected down to the depth at which the soil is being tilled. The mixing effect of the tillage operation makes the fertility status of the soil fairly uniform throughout the tilled area.

After taking each subsample (core), be sure to scrape away or discard the surface mat of grass. Otherwise, this will affect the soil test. After 10 or more subsamples have been collected from the uniform area. these should be mixed thoroughly in a pail in order to obtain a good representative composite sample. Soil from the pail is then put into a sample box for sending to the soil testing lab.

The laboratory needs to know exactly what kind of grass is being grown and whether the recommendation will be for maintaining an already established turf or establishing a new turf. The reason for this is that recommendations differ considerably depending on whether one will be applying fertilizer to the surface (i.e., maintenance application). Regarding soil type, the laboratory must know whether the soil is sandy or light in texture or predominantly clay and heavy in texture since texture has an important bearing on the amount of limestone recommended.

In conclusion, soil testing can be a very valuable tool to the turf profession. Its importance is readily seen and, when sampling procedures are followed correctly, fertilizer and lime recommendations from the soil test will be accurate and profitable to the user in terms of turf quality and vigor.

Source: NYSTA Bulletin 119

Seed Research Awards Turf Research Grant

Mike Robinson, (above left) President of Seed Research of Oregon, recently awarded a \$500.00 research grant to the Oregon State University Dept. of Horticulture. Tom Cook, Associate Professor, heads the turf research and instruction program. The money will be used to continue the fine research being undertaken by Mr. Cook and his students. Many golf course superintendents throughout the country are graduates of Cook's program.

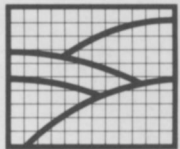
Plant Variety Protection Act Liability

The Federal District Court Magistrate in Eugene, Oregon, has determined that a person does not avoid liability under the Plant Variety Protection Act (7 USC Section 2321, et. seq.) by selling a protected variety of grass seed as V.N.S. or Variety Not Stated. The defendant in that case argued that he did not infringe on the variety owner's rights where he did not represent the seed to be a particular variety. United States Magistrate Michael R. Hogan disagreed. The court ruled that "the fact that defendant sold the seed as 'V.N.S.' is irrelevant to the issue of infringement."

The P.V.P.A. was enacted by Congress to give plant breeders the exclusive right to market new varieties for 18 years. The act is patterned after federal patent laws. Violations of the act carry heavy penalties including the possibility of treble damages and attorney fees. The act is relatively new and untested. The decision in Eugene appears to be one of the first to answer some of the questions that have troubled growers and seed companies.

Many in the seed industry have wondered whether a person could avoid liability for buying or selling protected varieties by either leaving them unmarked as to the variety name or marking them simply as V.N.S. or Variety Not Stated. The court held that labeling of the seed was irrelevant to determining liability under the act.

The defendant, a land owner, also argued that his rights in seed grown on his land were paramount to those of the variety owner especially where the protected variety was planted by previous tenant farmers under seed production contracts without his knowledge or consent. The court found in favor of the variety owner on that issue noting that the land owner had actual notice that the seed in question was a protected variety prior to the attempted sale. He therefore was subject to the variety owner's rights arising out of the P.V.P.A. certificate.



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Calendar of Events

- February 16-19** Northwest Flower and Garden Show
Contact: (206) 292-9198
- February 19-26** GCSAA 61st International Golf Course Conference and Show
Contact: GCSAA (800) 472-7878
- February 20-22** WSU Cooperative Extension
Pesticide Recertification Program
Contact: WSU Cooperative Extension County Office
- February 21-23** WSU Cooperative Extension
Pre-Licensing Pesticide Training Short Course
Contact: WSU Cooperative Extension County Office
- April 20** Calculations & Practical Mathematics for Use in
Turfgrass Management Seminar
Contact: GCSAA (800) 471-7878
- May 14** NTA Board of Directors Meeting
Contact: NTA Office (206) 754-0825
- June 25 & 26** NTA Summer Turfgrass-Fest
Contact: NTA Office (206) 754-0825
- August 13** NTA Board of Directors Meeting
Contact: NTA Office (206) 754-0825
- September 16** NTA Board of Directors Meeting
Contact: NTA Office (206) 754-0825
- September 17-20** NTA 44th Northwest Turfgrass Association
Conference & Exhibition
Contact: NTA Office (206) 754-0825

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