



Turfgrass University Research Fund (T.U.R.F.)

By Phoebe and Dr. Hairy Grosbeak** CPAg & CGCS

Once upon a time there was a Mother Hen and small flock of chicks in the barnyard. Two Spotted Owls were observing them from a nearby fence. Dollar Spot spoke first, saying, "Looks like the old Hen is feeding her chicks worms." "I don't think so," said Snow Mold, for he was the wisest Spotted Owl, "I think she is teaching them to scratch for themselves!"

Later, some of the chicks were transformed into Turfgrass Scientists. Some of the first research in turfgrass in America was carried out by Doctors Piper and Oakley with the United State Department of Agriculture (USDA) in 1916. In 1921, the United States Golf Association (USGA) joined the USDA in research at the Arlington Turf Garden in Arlington, Virginia, current site of the Pentagon. Thirty years later, Dr. Burton Musser (Penn State), Dr. Roy Goss (Washington State), Dr. Bill Daniel (Purdue), and others, continued the wise philosophy of "Teach them how to scratch for themselves." Dr. Musser taught Dr. Duich, the "Father" of Penncross, Penn Eagle, Penn Links (the putting gree turf for the world). Dr. Daniel taught Dr. Beard, the author of the turf textbook of the world, *Turfgrass Science and Culture*. Dr. Beard taught Dr. Gwen Stahnke of WSU. Dr. Goss and Dr. Brauen, of WSU, produced fertility, sulfur, and disease research pertinent for the PNW. Dr. Goss taught Professor Tom Cook, of Oregon State University. OSU and WSU continue the search for gifted students and solutions to turfgrass problems in the PNW.

In the 1950's and 60's Turfgrass Scientists were funded by the Turfgrass Industry and the general fund tax base of each Land Grant University's state. In those days, everyone and everything was "presumed innocent until proven guilty." About the time that Rachel Carson's book, *Silent Spring*, was written, the direction changed. Today in many instances "guilt is presumed" and the question becomes, "Can you afford to prove your innocence?" Industry was forced by governmental regulation to commit millions of dollars to prove that their products were efficacious and environmentally benign. Today industry must invest upwards of \$50 million and test products experimentally for 8-10 years before they are introduced to the market. Taxation was stretched to the breaking point in the 80's. Legislatures demanded universities

reduce spending. Universities saw that their income coming from tax support was restricted and much of the cost of university education was shifted to the student in the form of raised tuition fees. Today, tuition fees are in the multiple \$1000/semester range. Basic product research has always been done by Industry. Applied research, which is most important, has always been the specialty of the Land Grant University. Applied research might be described as an investigation of the efficacy of a commercially available product in local environmental conditions. In conjunction with applied research, university basic research continually develops knowledge that is used in Integrated Pest Management. IPM is defined as multiple tactics used in a compatible manner in order to maintain pest populations below levels that cause economics or unacceptable aesthetic injury without posing a hazard to humans, domestic animals, or non-target life forms. If Turf Managers are to continue to maintain turfgrass in an environmentally responsible manner, regionally pertinent applied and basic research must be continued.

The Northwest Turfgrass Association was founded in 1946 to support research and scholarship. Its members, who represent Industry and the Professional Turf Manager, have been supportive of research for nearly 50 years.

At the Old Course at St. Andrews, Scotland, golf was free until 1754, when golfers requested "special playing privileges" (what we, today, call "tee times"). These privileges were granted the golfers agreed to pay for the maintenance of the Old Course. Green fees for visiting golfers were first charged in 1913, on the Old Course. Modern golfers supported research by making contributions through the tax base helped by the non-golfers or all taxpayers. This large funding source is gone!

We golfers need to know that, without new outside funding, university teaching and research programs will disappear. Losses have already occurred and retiring researchers are not being replaced.

The Turfgrass University Research Fund (T.U.R.F.) is a fund supported by a coalition of concerned individuals from a number of golf-related organizations including the Northwest Turfgrass Association, the USGA, Washington State University, Oregon State University, the Oregon Golf Association, the Washington State Golf Association, the Pacific Northwest Golf Association, the Western Washington Golf Course Superintendents Association, the

(continued on page 2)

President's Message

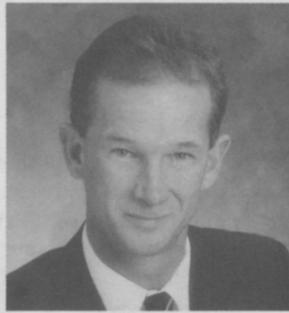
The key to good turf management is planning. During the winter months we have the time to set back and reflect on those hectic summer days and prepare and schedule for the coming year. While this is the case in most years, for many turf managers this winter is a time to rebuild and construct. With NOAA's earlier prediction of below average precipitation and low temperatures for the winter, many of us had our skis at the ready. Obviously El Nino had other plans for us. Instead of skiing around the golf course we have been mowing greens and moving construction schedules from April into January. We have to remind ourselves that this is winter and spring is still far away.

Winter is also the time to get caught up on the turf research that affects our particular areas of responsibility. During 1994 Tom Cook, OSU, Dr. Brian Holl, UBC, Dr. Stan Brauen and Gwen Stahnke, WSU Puyallup and Dr. Bill Johnston, WSU Pullman, were all busy with turfgrass research projects. I was fortunate to have visited most of these sites this past year and hope that each and every one of you can do the same. The research carried out by these scientists is made possible in part by donations from members of our association. Research updates are made at the annual turfgrass conferences held by the NTA and the WCTA. Remember, this is research done for the Northwest and not Pennsylvania or Texas. Sustained funding for these programs is as important to turfgrass managers in the Northwest as any fundamental tool or machine in your shop.

40-50 years ago weeds were the #1 concern for researchers. Now they face an ever increasing number of turfgrass diseases brought on by stress. This stress comes from lower mowing heights, longer playing seasons, turf types used in the wrong applications and a greater demand for "perfect" turf. We can control some of this stress, but much of it comes from end user demands that we as managers are too quick to try to meet. In our quest for the greenest, fastest and most disease free turf, we have outpaced research. Short term demands have jeopardized the long term health of the turf. For this reason and many others, funding of solid, sustained research is at a critical point. Government funding of turfgrass research has been and may continue to decline right when the need is increasing.

With this in mind the NTA board last year formed an advisory committee to develop a program of sustained funding for turfgrass research in the Northwest. The resultant program is called the Turfgrass Universities Research Fund or T.U.R.F. The mission statement of T.U.R.F is "Maintain effective funding in developing consistent, quality research projects and educational opportunities which benefit the golfing community." The first priority of this committee is to get the word out that an immediate need exists to better fund turfgrass research. Those who are the end users of turf, golfers in particular, will be asked to pay their share in a campaign called, "A Dollar for T.U.R.F." This kind of grass roots support is the key to continuing the high standards of turfgrass maintenance that the professionals, who make up our membership, are accustomed to providing.

Randy White, CGCS
President



Randy White

Research Fund (T.U.R.F.) (continued from page 1)

Oregon Golf Course Superintendents Association and the Inland Empire Golf Course Superintendents Association. If we could find a way to collect the value of three first class postage stamps or the value of 50 golf tees from each golfer in the Pacific Northwest each year – yes, that's right, \$1.00 per PNW golfer per year. We would be able to show the universities we care about maintaining our environmental responsibility and teaching our "chicks" to scratch for themselves.

Apple Tree Commits Portion of Annual Fees to T.U.R.F.

The Northwest Turfgrass Association was recently advised by the Yakima **Apple Tree Golf Course** Greenkeeper, Jim Dusin, that their Men's Club had committed one dollar of their annual fees for the **Turfgrass University Research Fund (T.U.R.F.)**. Included on the club's annual fees statement will be the following:

"NOTE: By approval at the general meeting, one (1) dollar of your annual fees is for funding research and scholarship programs at OSU and WSU. This program is monitored by the Northwest Turfgrass Association and supported by the PNGA and WSGA, OGA."

49th Northwest Turfgrass Conference Announced

The Northwest Turfgrass Association's **49th Northwest Turfgrass Conference** is scheduled for **October 9-12, 1995** at **Skamania Lodge** in Stevenson, Washington.

Preparations for the conference are well underway. Meeting space, the golf course, and a block of lodging rooms have all been reserved. The Education Committee is lining up an outstanding selection of presenters and the Conference Companion, Hospitality and Tours Committees are busy planning an exciting program of events.

Planning and preparations are in the able hands of the following conference committee chairpersons: **Tom Christy** and **Kim Lay**, companion program; **John Monson**, education program; **Jim Dusin**, golf tournament; **Jim Dusin**, sponsor program; and, **Kay Kinyon**, tours. Registration, hospitality and logistical arrangements are handled by staff. The committee chairs and staff, working within parameters established by the NTA Board of Directors, make-up the network of individuals responsible for this year's conference.

Skamania Lodge Offers Unpretentious Getaway

Skamania Lodge is perched high on the hills just west of Stevenson, Washington. The massive timber and stone structure looks over the Columbia Gorge National Scenic Area, just 45 minutes by car from Portland and 3 & 1/2 hours from Seattle.

The fir-trimmed interior is grand yet cozy, and the activities options are numerous.

The lodge caters to both the sedentary and the active traveler: golf course, hiking trails, mountain bikes, tennis courts, stables, an indoor pool and outdoor whirlpool are all offered on site.

The casual dining room menu isn't as long as the activities list, but it certainly offers the best of the Northwest's bounty. The lodge Sunday brunch is "legendary"-and that is difficult to do for a place that just opened its doors a couple of years ago. A lounge also offers an even more casual Northwest fare.

Bridge of the Gods Golf Course Site of 1995 R.L. Goss Golf Tournament for Research

The 1995 **R.L. Goss Golf Tournament for Research**, scheduled October 9, 1995, the first day of the annual conference, will be at the Skamania Lodge Bridge of the Gods Golf Course. Out of 70 acres of second growth Douglas Fir trees and brush, lakes and hills, Gene C. (Bunny) Mason of Recreation Management, Inc. has laid out a challenging 18-hole golf course. Players start at the Pro Shop near the main lodge and travel the fairways through a natural gorge setting with views of the river and mountains, past water hazards and two small lakes. The course is a moderate length of 6200 yards with a hummocky terrain.

The course brings players back again and again because it isn't a cake walk. One Pro once described the course as "target golf at its best." For accomplished golfers, there is a way to play the course that could almost be classified as "extreme golf." Other golfers will be able to take advantage of a variety of tee positions and play a casual game if they wish. Beginning golfers will also find the course fun. Any level golfer is bound to improve their game on this course.

1995 Research and Scholarship Fund Raising Campaign Kicks Off

Randy White, NTA President and Mike Erb, NTA Research and Scholarship Fund Committee chairperson, recently announced the kick-off of the **1995 Research and Scholarship Fund Raising Campaign**. For the past few years NTA has annually given out between \$25-35,000 in research grants and \$3-5,000 in scholarships. The success of the annual fund raising campaign is a key factor in the level of support NTA can provide to these efforts.

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 gave their time and money to make the research and education possible, for without them we would have to rely on our own individual trial and error methods.

Few of us are independently capable of, nor prepared to conduct the research or development 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 financially contribute to industry research and education advancements.

Donation forms will be mailed to members and industry supporters with the next month or so. Contributions are **tax deductible** and those contributing to the research and scholarship fund are recognized in the annual **Directory of the Northwest Turfgrass Association**.

Buy a share today in better turfgrass for tomorrow.

T.U.R.F. Advisory Committee Meets

The Northwest Turfgrass Association recently hosted the second meeting of the **Turfgrass University Research Fund (T.U.R.F.) Advisory Committee** at Seatac Airport. The meeting room looked like a "Who's Who" of Pacific Northwest golf. Golf organizations represented at the meeting included the **United States**

(continued on page

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T.U.R.F. (continued from page 3)

Golf Association, the Pacific Northwest Golf Association, the Oregon Golf Association, the Washington State Golf Association, the Oregon Golf Course Superintendent's Association, and the Western Washington Golf Course Superintendents Association. The two teaching and research universities in the region, Oregon State University and Washington State University, were also represented at the meeting.

Topics of discussion at the meeting included a progress report on initial efforts to kick-off the T.U.R.F. program initiated last year by then NTA president, Tom Christy; discussion of strategies for getting the message out regarding the goals and objectives of the T.U.R.F. program; strategies for making golfers aware of the direct benefits to them of turfgrass research; and, strategies for involving both golfers in the financial support of turfgrass research.

Annual Dues Statements

The second Annual Dues Statement notice for 1995 was just recently mailed to those that had not yet responded to the first notice mailed in December. Those who have already paid their membership dues for 1995 should not receive the second notice.

The Northwest Turfgrass Association is a non-profit corporation founded in 1948 to help all people involved with and interested in turfgrass culture in the Northwest. The association has grown in the last few years from around 200 members to over 480 individuals involved in turf facilities development and maintenance in public schools, universities and colleges, parks, golf courses, cemeteries, sports fields, commercial facilities, home lawn care operations and others.

95/96 Research Grant Application Information

The Northwest Turfgrass Association is now accepting proposals relating to turfgrass research grants for the 1995/96 academic year. Research proposal grant applications must be submitted in a prescribed format.

Consideration of proposals will be in accordance with the following guidelines:

1. they shall be from sources within the Pacific Northwest;
2. they must be for activity that will directly benefit the turfgrass industry in the Pacific Northwest; and,
3. the activity shall be underway or initiation shall be imminent.

All proposals for 1994/95 should be submitted to the NTA office no later than **March 30, 1995**. Questions relating to research proposal grant applications should be directed to the NTA office-(206) 754-0825.

95/96 Scholarship Application Information

The Northwest Turfgrass Association is now accepting applications for turfgrass scholarships to be awarded for 1995/96 academic year. Scholarships are for \$1000.

Scholarship applicants should complete a copy of the prescribed Scholarship Application Form.

Guidelines used when applications are considered include the following:

1. applicants shall be enrolled in a college or university in the Pacific Northwest working toward a turfgrass science related degree;
2. applicants must: have completed the first year at a two year community college or vocational/technical institute; be a junior or four year college or university; or be a graduate student;
3. applicants shall have outstanding qualities as individuals and students including integrity, initiative and leadership; and,

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4. applicants shall have a desire to make a contribution to the turfgrass industry and profession in the Pacific Northwest.

All scholarship applications for 1995/96 should be submitted to the NTA office no later than **March 30, 1995**.

For further information about the scholarship program or application information, contact the NTA office-(206) 754-0825.

Names In The News

Arlen D. Davison recently stepped down as Superintendent of the WSU Puyallup Research and Extension Center and units in western Washington, but will remain Assistant Dean of the College of Agriculture and Home Economics until his retirement June 30, 1995. Dr. C. Alan Pettibone has assumed the role of Superintendent until June 30, 1996.

Salishan Lodge in Gleneden Beach, Oregon and the **Oregon Golf Club** at West Linn, Oregon have become the first two golf courses in the state of Oregon to be certified for the Audubon Sanctuary Program.

Western Equipment Distributors, Inc. based in Kent, Washington, was recently recognized by The Toro Company as one of the company's top three distributors for sales and service of commercial equipment for 1994.

R.H. "Dick" Bailey, well known agronomist and owner of R.H. Bailey Seeds, Inc. in Salem, Oregon, died of cancer November 29, 1994 at his home in Kaiser, Oregon.

Hunter Industries, Educational Services Department, recently announced the release of a new irrigation training program entitled, "Precipitation Rates and Sprinkler Irrigation," intended for educators, distributors, contractors and irrigation system designers.

Oregon Golf Club at West Linn, Oregon, won the grand prize for a commercial development in the All-American Rose Selections' national 1994 "Landscape With Roses Contest."

George H. Heywood has left the Monsanto Company, Agricultural Group, based in Corvallis, Oregon, to accept a position with Timberland Enterprises, Inc. in Maine, a full service distributor of herbicide products.

Gordon Zielinski is now the Executive Vice President of Turf Seed, Inc. This is a new position created to assist President Bill L. Rose with special projects and international growth.

Par for the Course, the Golf Course Superintendents Association of America's national television program, began airing the first of 30 episodes on ESPN in January of 1995. The show will air on Thursday, Friday and Sunday dates throughout the year.

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1995 Sponsor Program for Research

Turf grounds maintenance and irrigation suppliers and other interested parties will soon be invited to participate in the **1995 Sponsor Program for Research** by financially sponsoring an activity or event during the Northwest Turfgrass Conference conducted annually by the NTA. Around 300-400 golf course, park, sports facility, lawn grounds maintenance and ornamental professionals and suppliers interested in the latest turfgrass-related research and developments are usually in attendance.

The purpose of the Sponsor Program is to provide industry suppliers with an opportunity for **tax deductible** advertisement of their companies and, at the same time, through the reduction in conference costs, free up more conference receipts for funding research activity and scholarships. During the very successful trial year of the program in 1993, the focus was on golf tee sponsorship during the preconference R.L. Goss Golf Tournament for Research. Sponsors had a professionally-constructed, multi-color sign of their company logo and name at a tee plus a reproduction of the tee sign on a sponsor sign board that was displayed at all the major events during the conference.

The Sponsor Program was expanded for the 1994 conference, to include a variety of conference-related sponsor opportunities, in addition to golf tees. Sponsor opportunities will include:

- Golf Tee Sponsor** (preconference **R.L. Goss Golf Tournament for Research**)
- Speaker Sponsor** (Preconference Seminar and/or Conference Key Note Speaker; Conference Speakers; Conference Entertainers)
- Food Services** (Preconference Event Luncheon; Presenters/Past Presidents Reception; Get Acquainted Reception; Luncheon; Women in Turf event; T.U.R.F. Program Advisory Council Luncheon; Coffee/Refreshment Breaks; et al.)
- Underwriter** (Overall Conference Underwriter)

Depending upon the level of sponsorship, sponsors will receive recognition for their sponsorship ranging from signage at an event and during the conference to special recognition throughout the year in the **Northwest Turfgrass Topics** newsletter.

WSU Field Day Scheduled

Dr. Stan Brauen, WSU Research & Extension, recently announced that the WSU Field Day has been scheduled for June 6, 1995. He indicated the event may take on a new look this year but he had nothing official to announce yet.

Minor Crops/Minor Use Dilemma

by Ted Maxwell

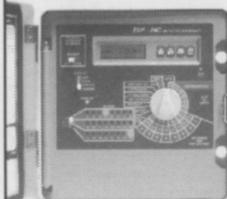
There are few issues that impact agriculture in Washington state so profoundly as the so-called minor use or minor crop issue. For Washington, the only thing "minor" about our minor crops is the pesticide use pattern. Washington ranks third in the nation in value of production on minor crops. Thirty-seven or thirty-eight (depending upon the definition you use) of the top forty crops grown in Washington are considered minor crops. They include all fruit, nut and vegetable crops; commercially grown flowers; ornamental crops including trees and **turfgrass**.

Of the top ten crops grown in Washington, only one is considered a major crop – wheat – and this has "minor uses" because of infrequent or limited acreage of the pesticide applications. Although minor in acreage, many of the minor crops grown in Washington make up a considerable portion of the national acreage for the crop. The most obvious example of a minor crop of production in Washington accounts for approximately 75% of U.S. production; lentils make up approximately 60% of the national production; and red raspberries make up approximately 65% of the national production.

In the past, many pesticide registrants included minor uses on their pesticide labels as a service to growers. That has significantly changed. In 1984 the registration requirements in FIFRA (the Federal Insecticide, Fungicide and Rodenticide Act) were revised, increasing the

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ANNOUNCEMENT AND INVITATION

FOR THE
OCTOBER 9-12, 1995



NORTHWEST TURFGRASS CONFERENCE

SKAMANIA LODGE AND CONFERENCE CENTER

(In The Columbia Gorge)
Stevenson, Washington

The Board of Directors of the Northwest Turfgrass Association (NTA) extends a cordial invitation to the members of the association, their colleagues, employees, companions, friends and others interested in the turfgrass industry in the Pacific Northwest to attend and participate in the **49th Northwest Turfgrass Conference**.

Research and development information provided by national and international turfgrass and ornamental experts; the annual golf tournament; turf facilities and ornamentals tours; and a variety of networking opportunities are some of the major components of the conference. Other events include the annual business meeting of the association and election of board directors; an excellent companions program; and a number of social activities designed for everyone.

Skamania Lodge in Stevenson, Washington in the Columbia River Gorge will be the conference site for the hundreds of golf course superintendents; parks, cemetery, school and other grounds maintenance personnel; professional consultants; landscape and lawn care personnel; equipment and product suppliers; research and extension staff; and others involved in the turfgrass industry from throughout the Pacific Northwest who will assemble for the premiere professional development conference.

49th
NORTHWEST TURFGRASS CONFERENCE

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Thanks,
NTA R & S Committee

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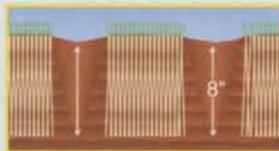


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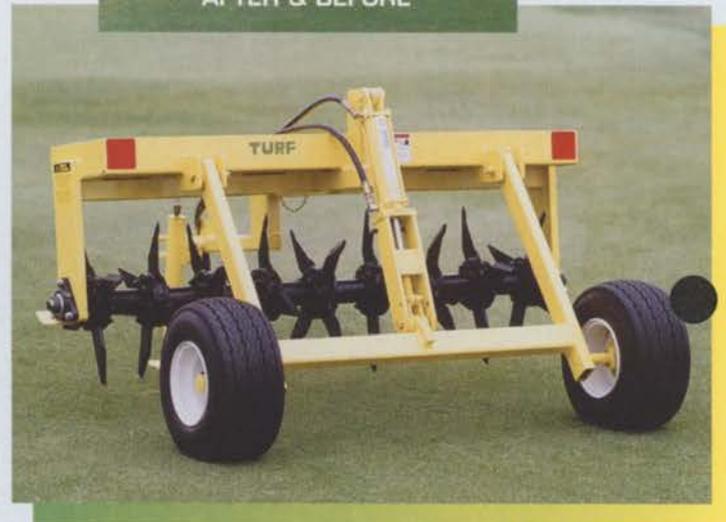
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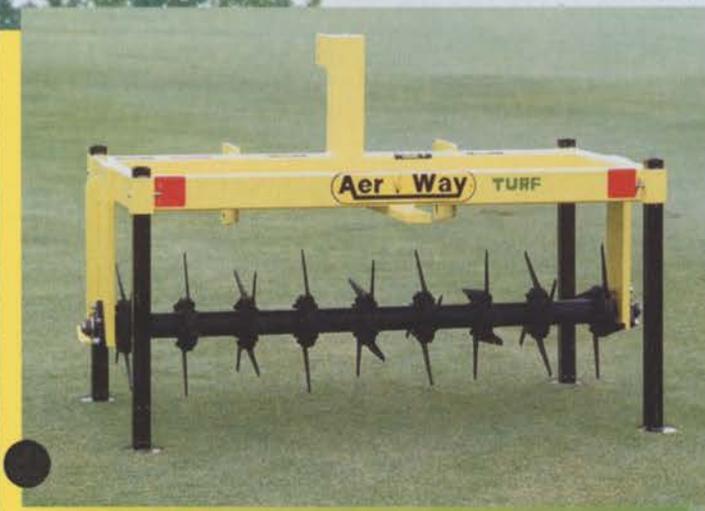
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6' PULL TYPE (20 to 30 H.P.)	AW060H-1365-C 730 lbs	AW060H-1380-C 750 lbs	AW060H-1B17-C 969 lbs	AW060H-1F06-C 959 lbs
6' QUICK ADJUST (25 to 40 H.P.)	AW060Q-2365-C 1088 lbs	AW060Q-1380-C 1168 lbs	AW060Q-2B17-C 1360 lbs	AW060Q-2F06-C 1310 lbs
7' 6" STANDARD (25 to 40 H.P.)	AW076S-2365-T 490 lbs	AW076S-2380-A 510 lbs	AW076S-2B17-T 800 lbs	AW076S-2F06-T 785 lbs
7' 6" PULL TYPE (25 to 40 H.P.)	AW076H-2365-T 740 lbs	AW076H-2380-A 765 lbs	AW076H-2B17-T 1055 lbs	AW076H-2F06-T 1040 lbs
8' QUICK ADJUST (35 to 55 H.P.)	AW080Q-2365-C 1305 lbs	AW080Q-2380-C 1330 lbs	AW080Q-2B17-C 1620 lbs	AW080Q-2F06-C 1605 lbs

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requirements for registration of new pesticides. In 1988, FIFRA was again amended, requiring all pesticides registered before 1984 meet the same standards as those registered after 1984. These new reregistration requirements dramatically increased the cost of maintaining existing registrations. Many registrants were forced to reevaluate their position regarding maintenance of their registrations. As a result, a disproportionate number of minor use registrations were lost.

At the beginning of reregistration in 1988, approximately 44,000 pesticide products representing 611 active ingredients were registered for use. In October 1991, the EPA reported that the number of registered pesticide products was reduced to approximately 20,000, representing 405 active ingredients. Approximately 4,000 food uses are affected. In the reregistration process, approximately 1,000 high priority minor uses will be supported by registrants. Because Washington growers produced a large number of minor crops, the impact of reregistration has been acute. The lack of crop protection tools threatens the state's ability to grow some crops. In many cases, growers have been left with less effective alternatives, more expensive alternatives, or alternatives that are more hazardous to humans or the environment. In some cases the grower is left with no alternatives at all.

The problem was first articulated by Cooper Evans, Special Assistant to the President for Agriculture, in his report dated November 9, 1990, entitled "Loss of Safe Pesticides for Minor Crops, An Analysis". The report stated that, "Production of fruit, vegetable and other specialty crops is in serious trouble. Consumer demand is strong, yet U.S. producers may lose this market opportunity - unless policies are changed to assure availability of safe, effective pesticides." The report began a serious national debate on the issue that still has not resulted in significant relief and the problem continues to increase. It is exacerbated by pesticide losses due to the Delaney Clause.

There are numerous examples to illustrate the problem that other speakers will provide so I will not go into detail.

Why the problem?

For the most part, the loss of registered products has been a result of economic decisions on the part of the registrants, not safety reasons. Several factors may influence a registrant's decision to drop minor use registrations:

1. **Profit/Loss.** In many cases, the profit from the sale of the pesticide for the minor use is outweighed by the cost of generating additional data required. The cost of generating additional residue data on a specific crop can run between \$20,000 and \$150,000. The cost of adding a registration for a new crop to an existing label can range from \$100,000 to \$500,000. Faced with these costs, registrants cannot justify registering products on crops which do not require a significant pesticide usage. They simply have no hope of getting a return on the investment.

2. **Dietary exposure.** A widely used pesticide may have a dietary exposure problem which requires the registrant to reduce the acceptable daily intake (ADI) for that pesticide. The registrant may delete minor uses until the ADI is no longer exceeded.
3. **Crop Liability.** If there is potential for phytotoxicity to a crop from a minor use which could result in a possible law suit, the registrant must weigh the cost of potential litigation against expected profit from the sale of the pesticide for the minor use. In many minor crop situations, the acreage is extremely small and the crop value is high. The cost of one litigation could negate any profit the registrant might expect to generate over a period of years.
4. **Maintenance fees.** The EPA imposes an annual maintenance fee for pesticide registrations. In some cases, even this fee can negate any potential profit from sale of the pesticide.
5. **Reregistration time lines.** The time limits imposed by the 1988 revisions to FIFRA, together with the limited resources available to registrants, may become an important factor in deciding to eliminate minor uses from the label. Faced with a choice of how to spend limited resources under tight time constraints, a registrant is likely to elect to spend them where there is the greater potential for return on investment.
6. **New product registrations.** Although the EPA has put certain incentives in place to encourage registrants to consider minor uses when developing new pesticides and alternatives, the same economic disincentives that apply to reregistration also discourage investment in new product registrations and alternatives for minor uses.

The role of the WSDA:

In many instances, relief at the state level from the loss of minor use pesticides comes from two programs found in the Pesticide Management Division of the department: Special Local Needs (SLN) registrations, and Emergency Exemption form Registration (Section 18). The information provided by WSU and the industry is a critical part of that process.

The SLN registration program enables the department to issue a federal registration for a special local need within Washington. In many cases, SLN registrations can be granted for minor pesticide uses. The registration staff must review the request and accompanying data to ensure that use is in accord with the (15.58) and the Washington Pesticide Application Act (18.21). Each year the department grants approximately 40 SLN registrations, saving the growers of the state a minimum of \$50,000,000 each year.

In certain situations where an SLN registration is not possible (i.e., where a tolerance does not exist for the pesticide on the crop in question), it may be possible for the department to request an emergency exemption from registration (Section 18). The situation must involve an urgent non-routine emergency where no effective alternatives are available. Approximately 20 exemptions
(continued on page 8)

Minor Crops/Minor Use (continued from page 7)

are granted by the EPA for the state of Washington each year, saving the growers of the state between \$25,000,000 and \$250,000,000. The section 18 for Admire on apples is an example.

The department has had major involvement in the federal issues surrounding minor crops, SLN registrations, and emergency exemptions, and other pesticide issues of importance to the state of Washington. As active members of the American Association of Pesticide Control Officials (9AAPCO) and the States FIFRA Issues and Regulatory Evaluation Group (9SFIREG), the department has been able to influence how the EPA deals with these programs. Recently, the department has been involved in working with the EPA during their development of the federal Section 18 and 24(c) guidance documents. This type of involvement at the federal level is vital to the growers of this state who depend heavily upon these programs.

Conclusion:

The opportunities for Washington agriculture are immense. We have access to markets, knowledgeable growers, tremendous natural advantages with climatic diversity. Minor crops, the expansion of production and the diversification are the keys to agricultural prosperity. Many of these minor crops have value added in processing. The major impediment is the tools to control pests and make production profitable.

Winter Turfgrass Injury Defined

by Dr. Darrell Tompkins
Research Director, Prairie Turf Research Center

Winter injury to turfgrass can occur for a number of reasons. Low temperatures or repeated freeze-and-thaw cycles are two of the main causes. Freezing causes desiccation in plants, because water moves out of cells when it freezes. This causes pressure against cell walls which can eventually cause the walls to rupture and die.

Generally, turf plants acclimatize in the fall as the temperature drops at night and is a signal to plants to harden off. Plants ideally need a gradual drop in fall temperature to acclimatize and harden off before winter.

High risk times for winter injury are February to April, because of potential fluctuations in temperature.

Other factors affecting cold hardiness levels are water and sugar content. The less water there is in a turf plant, the harder it will be, because when ice does form it will rupture cells. This is why dips in turf where water can collect, and poorly drained areas are more prone to snow mold.

High sugar levels or salinity, will also lower the plant's freezing point.

Mowing closer to the ground more frequently in the fall is suggested, as well as cutting back on nitrogen applications, while increasing potassium. Turf plants which are fed a lot of nitrogen in the fall, go into winter in a weaker state.

The PTRC is researching low temperature injuries. Part of the research is on crown hydration in *Poa annua*. The PTRC recently received funding from the Canadian Turfgrass Research Foundation (CTRF) for this study.

Research will look at physiology of low temperature injury with emphasis on crown hydration and control of winter injury to *Poa annua* using winter covers.

The most common result of low temperature injuries is snow mold. Research will also evaluate snow mold resistance on different bentgrass cultivars, fungicide trials and biological controls.

The control of snow molds will be researched because of the days of using mercury-based fungicides may soon be over. For example, Calo-Chlor, which is used to control all types of snow molds, will soon be deregistered.

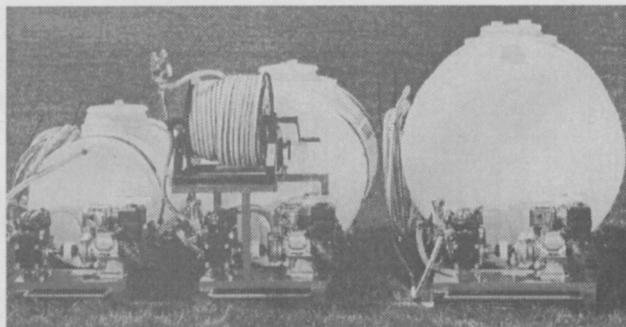
Other fungicides do not necessarily control all snow molds and fungicide rotations may also be important to prevent resistance build up in turf plants.

Because of this it will become more important for golf course superintendents to be able to distinguish between different snow molds to select proper fungicides. There are three types of snow mold.

Gray Snow Mold

Gray snow mold *Typhula* spp, appears in a gray to gray-white mycelial mat once the snow disappears. Symptoms first show up during snow melt as circular areas of light yellow or greyish-brown turf. These areas

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can range from 5 cm to 1 metre or more in diameter. Infected areas appear matted together and are often covered with grayish-white mycelium. Large areas of the turf may be killed, but most typically, only the leaves are killed and the plant produces new leaves during the spring.

Life cycle:

Gray snow mold survives as sclerotic matter during the summer. With cool, wet conditions and diffused light in autumn, the mold germinates. If this area were buried or exposed to direct light, germination would not occur. Once it snows, mycelia infect the turfgrass under the snow.

Diseases tend to occur in the same areas year after year if conditions are favorable.

Control:

Gray snow mold can be controlled by avoiding deep snow cover, heavy wet mulch and high rates of nitrogen application in the fall. If nitrogen must be used, slow release forms are recommended for late season fertilization.

Continue to mow grass, so snow doesn't fall on a heavy canopy and avoid excess thatch. Prevent large snow drifts, by using short snow fences or poplar branches.

Promoting rapid drying and warming of disease-prone areas in spring, through snow removal and adequate drainage is also an effective control.

Fungicides can be used as a preventative measure in the fall. Systemic fungicides should be used before growth stops. Contact fungicides can be applied in late fall and again just before the first predicted long-lasting snow fall. Applications may be repeated during mid-winter thaws.

Olds College is also looking at potential biological controls for gray snow mold.

Pink Snow Mold

Pink Snow Mold *Microdochium nivale* formerly *Fusarium* appears pink only under certain conditions and is not limited to snow-covered turf.

Pink Snow Mold is used to describe the disease associated with snow melt, while *Fusarium* patch (the original name) has been retained to describe the disease when it occurs without snow cover.

Symptoms:

Circular patches of affected turf may develop whenever prolonged periods of cool, wet weather occur. Under snow cover in wet conditions, a thin covering of white mycelium may be seen on matted leaves. The mycelium is white, but exposure to sunlight incudes the production of pinkish spores. When snow recedes, the patches can be confused with *Typhula* blight.

Life cycle:

The disease survives unfavorable periods in infected grass plants and dead debris and will spread rapidly in cool, wet conditions.

Control:

Like Gray Snow Mold, heavy thatch, fall nitrogen application and over watering should be avoided. Long grass, poor drainage and high humidity (i.e. drizzling rain) will also promote the disease. Control measures are generally the same as with Gray Snow Mold, but a low soil pH and high potassium balanced fertilizer in the fall are more of a necessity.

Coprinus Snow Mold

A third mold, *Coprinus Snow Mold Coprinus psychromorbidus* is revealed with receding snow. It appears in circular or irregularly shaped snow mold patches with white to gray mycelium. Infected plants have rotted, water-soaked leaves or leaf lesions. The lesions or leaves, become dry and have dark, red-brown margins.

Life cycle:

The disease cycle is similar to Gray Snow Mold and is promoted by prolonged periods of snow cover.

Controls:

To control *Coprinus Snow Mold*, rapid snow melt and drying should be encouraged on high value turf. This can be done by spreading snow drifts, fine ashes or charcoal or by snow fencing to avoid heavy snow in high-value or susceptible areas. Fungicide may be applied two to three times from autumn to winter and resistant cultivars introduced.

Editor's Note: This article is a summary of the presentation by Dr. Tompkins at Guy's Hy-Tech Sands golf course turf show.

Winter Kill & What To Do About It

by Darin W. Lickfeldt

Fall has passed and winter is upon us, but have you prepared your grasses for winter? Now that the stress of the season is past, let me remind you of what may come—winter injury.

There are several forms of winter injury that can occur to cool-season turfgrasses and these included ice encasement, traffic damage, low temperature diseases and freezing injury. Is there anything you can do to prevent or at least lessen the severity of winter injury?

May of you have heard the term "crown hydration," which is associated with the idea that grass plants hydrate in response to warm temperatures in the spring and then are irreversibly injured by low temperatures. Unfortunately, this phenomenon has received only limited attention of researchers to pinpoint the mechanisms of dehardening and what conditions are necessary for it to occur. In one study, researchers found it takes only 4 days of 40°F for perennial ryegrass to deharden, indicating how easily this process occurs.

(continued on page 10)

Winter Kill (continued from page 9)

Another theory is "crown dehydration." This involves grass plants losing so much water that they are severely injured and cannot commence normal metabolic processes in the spring. Scientists have determined that the formation of ice crystals between cells actually draws water out of cells causing dehydration, but how lethal such processes are to turfgrasses has not been determined. We can have ice form between cells and the plants will remain alive in many instances, and fortunately ice almost never forms inside of cells which are full of carbohydrates.

Both of these theories are being evaluated at the University of Wisconsin-Madison with the intent of determining what spring conditions are necessary to cause dehardening in annual bluegrass, creeping bentgrass and perennial ryegrass. Also, when and how do our turfgrasses decide it is spring? Are there specific mechanisms within the plant we can control? The next step will be convincing the turf not to induce such mechanisms in the early spring since there are still very cold days to endure.

The Science

In order to prevent intercellular ice formation, the plants will concentrate sugars in their cells. This lowers the temperature at which the water in the cells will freeze because whenever we dissolve a solute in water we lower the freezing temperature of the solution. This seems relatively simple: let's just build up the concentration of sugars and the cells will not freeze, right? Let's examine how this might be accomplished.

Many of us will put on a few pounds in the fall and our friends will jokingly say we are fattening up for the winter. We fatten up by eating excessive quantities of food which are converted into body fat. Well, the fat is a food reserve which may allow us to survive long periods without food. When needed, we can use up these food reserves. Believe it or not, plants behave similarly.

Recall how plants produce their own food. The soil is important for providing nutrients, but all plants actually produce food from photosynthesis. Remember, sunlight, water and carbon dioxide convert to oxygen and sugars. When plants are growing these sugars are quickly utilized for making more plant tissue. When growth slows appreciatively in the fall at cooler temperatures, where do all of the sugars go? To storage reserves? No, plants do not fat, but the sugars are stored in the roots and crown where they later can be used by the plant to get energy. Rather than fat, plants store potential energy in the form of fructans. Did the sugars build up to lessen ice formation, or was this purely in response to decreased growth rates while photosynthesis was still continuing? This is another question that is being addressed at UW-Madison.

What Can We Do?

Regardless of why plants build up sugars, we do know that we need to have sugar reserves to improve winter survival. To get more sugars we need more photosynthesis and less growth. Less growth is occurring because we are not fertilizing with water soluble fertilizers

in September and October, right? More photosynthesis can only come from increasing leaf surface area (raising mowing heights) and decreasing shading. Plants actually continue photosynthesis throughout the winter, and there is not a lot we can do to increase photosynthetic rates. Therefore, we need to concentrate our efforts in reducing growth rates in the late fall and early spring.

The late fall, dormant N fertilization that has become so popular is probably not detrimental to winter survival because the plants have stopped growing appreciatively. If nothing else, dormant N fertilization may improve the turf's recovery potential the following spring when injury occurs. My concern is that the late fall N fertilization is encouraging early spring green up which is just too early, but the effect of late fall N fertilization on dehardening has not been evaluated.

What about potassium? This is one area that has been addressed by researchers and nothing conclusive was ever found. In one study, winter injury was lessened; in the next there was no improvement. There was even one study where tissue K concentrations reached 3% of the tissue weight, but winter survival was not improved. Therefore, the application of K in the early fall will not worsen winter injury, but its benefit is still not proven.

Clearly, we need to have a balanced fertility program throughout all year to lessen the damage from all stresses that may occur. Therefore, if soil tests indicate adequate K levels, the application of additional K is futile.

The use of synthetic covers has gained tremendous popularity for nursing sensitive grasses through low temperatures. Winter covers can help grass plants

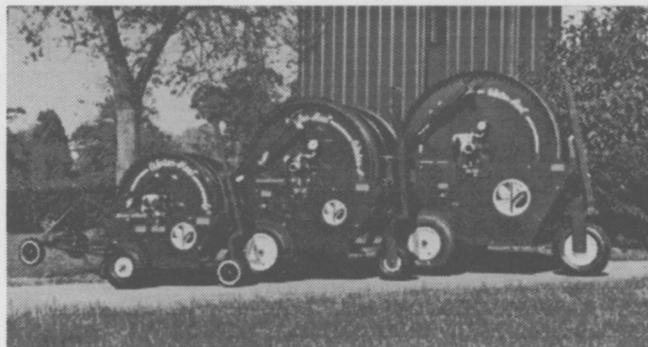


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acclimate to cold by continuing the storage of photosynthates when such processes have slowed appreciatively, but the grass under covers dehardens quickly in the spring due to the buffering of temperature extremes. Dehardening under synthetic covers greatly increases the moisture content of plants, making them very susceptible to damage during freeze-thaw cycles. Therefore, you can expect the labor intensive application and removal of covers during the spring or else winter injury will be worse than if no covers were used.

If ice is allowed to remain on annual bluegrass for more than 60 days, turf damage can be expected. Surprisingly, some varieties of creeping bentgrass can remain alive under ice for as long as 90 days, but there are not very many pure stands of creeping bentgrass, are there? Consequently, superintendents are usually taking necessary steps to mechanically remove ice from turf as soon as possible and the removal of ice usually lessens winter injury.

In conclusion, I recommend increasing your population of creeping bentgrass or Kentucky bluegrass, maintaining moderate N levels throughout the year, improving soil infiltration rates, raising mowing heights in the fall, removing ice and stopping all traffic in order to minimize winter injury on turf. Since none of these management practices has become an acceptable method for completely preventing winter injury, synthetic turf covers are available to ensure plant survival when turf quality must be maximizing the turfgrass's recovery potential in the fall so that the stand will rapidly recover in the spring from any injury that occurs.

The value of such management practices are being investigated, and new management practices for ensuring winter survival will soon be evaluated.

Source: Hole Notes

Making Turf Diagnosis Easier

The Plant and Pest Diagnostic Clinic (PPDC) at Ohio State University recently published this list of the top 10 factors you should include when writing or calling a college or university about a turf problem:

1. **List all symptoms.** Describe the general appearance of the turf. Does it look water-logged, dried or scorched? Have any patterns or color changes occurred? A clear color photograph is the best visual aid.

2. **Pattern of development.** Does the problem appear in full sun or shade? Do the affected areas occur near irrigation lines, high traffic areas, sidewalks or buildings? Does it occur in low, moist places?

3. **Amount of turf affected.** How much of the lawn, green or field is affected? Do lawns nearby show similar symptoms?

4. **Crop.** Please list grass varieties planted, so consultants can determine which grass is more affected by the pathogens.

5. **Seeding date.** Was the lawn seeded or sodded recently, or is it a mature lawn?

6. **Time of infection.** When did symptoms first appear? What were the weather conditions prior to symptoms? Did the condition worsen coincidentally with an environmental or cultural change?

7. **Treatments.** When, at what rate, and what chemicals or fertilizers were applied? Was the grass irrigated before or after treatment? Send any samples of turf before fungicide applications were made. Fungicides prevent or impair culturing results.

8. **Irrigation.** Specify frequency, amount and time of day that irrigation is applied, if any.

9. **Cultural practices.** Was the turf aerated or top-dressed? When? Did the problem occur afterward? How long afterward?

10. **Environment.** What amendments have been added to the soil? Include the results of recent soil tests, if applicable.

Source: Landscape Management

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- March 6-7, 1995** NTA Board Work Session & Meeting
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- May 1-2, 1995** NTA Board Work Session & Meeting
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- May 23, 1995** OSU Field Day
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- June 6, 1995** WSU (Puyallup) Field Day
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- August 8, 1995** NTA Board Meeting
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- October 8, 1995** NTA Board Meeting
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- October 9-12, 1995** 49th Northwest Turfgrass
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