NORTHWEST TURFGRASS TOPICS

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1987 Northwest Turfgrass Conference a Success

This year's Northwest Turfgrass Conference at Salishan Lodge September 21-24, 1987 was an outstanding success for the 400 attendees.

Over 30 excellent presentations covering a wide range of turf care topics were available for the conference attendees. Presentors from throughout the nation and Canada served to maintain the usual high quality of information available at the annual Northwest Turfgrass Conference.

Over 100 golfers played in the mens and womens tournaments. The men's tournament results were as follows:

CHAMPIONSHIP FLIGHT

Gross

Jeff Thomas, Superintendent, Walla Walla Country Club, Walla Walla, WA.

Net

1st — F.J. Carbonatto, Superintendent, Fairwood Golf & Country Club, Renton, WA; 2nd — Greg Hall, Superintendent, Rainier Golf & Country Club, Seattle, WA; 3rd — Dan Kukla, Superintendent, Glen Acres Golf & Country Club, Seattle, WA; 4th — John Zoller, Sr., Executive Director, Northern California Golf Association, Pebble Beach, CA; 5th — Ron Proctor, Superintendent, Twin Lakes Golf & Country Club, Federal Way, WA.

FIRST FLIGHT

1st — Bud Cook, Consultant, Pacific Calcium, Inc., Tonasket, WA; 2nd — Barry Galde; 3rd — Steve Houghton, Area Manager Professional Sales, J.R. Simplot, Company, Lathrop, CA; 4th — Norm Whitworth, Consultant, Norm Whitworth, Ltd., Oak Grove, OR; 5th — Stan Bailey.

SECOND FLIGHT

1st — Sam Chastin; 2nd — Doug Gates; 3rd — Ed Adrian, Superintendent, Everett City Golf Course, Everett, WA; 4th — Mark Snyder, Superintendent, Salishan Golf Links, Gleneden Beach, OR; 5th — Mike Tight, Superintendent, Northshore Golf Club, Tacoma, WA.

The supplier "hands-on" demonstration and exhibits Tuesday afternoon and evening were very well attended and found to be extremely informative and worthwhile. The NTA recognizes and appreciates the valuable contribution and great support the turf care industry suppliers continue to demonstrate at each conference and this year was no exception to the rule. Drawing prize winners at the exhibit included: Bob Grover, Barb Tight, Marci Goss, Marvin Duran, Frances Malpass, Steve Lokey, Lee Robinson, Dean Hanson, David Phipps, Suzie Becker and Michael McPhereson.

Most everyone attending expressed the view that this year's conference was one of the best. If you missed it, we hope you don't make the same mistake next year.

Officers and Directors Elected

James R. Chapman

Thomas W. Cook

William J. Johnston

During the 41st Northwest Turfgrass Conference, James R. Chapman assumed the presidency of the Northwest Turfgrass Association for the 1987-88 association year after having served as vice president during 1986-87. Chapman is a Technical Services Manager with The Chas. H. Lilly Company who has served as on officer and board director of the NTA in the past.

Elected vice president (president-elect) was Mike L. Kingsley, Golf Course Superintendent at MeadowWood Golf Course in Liberty Lake, Washington. Mike was first elected to the board of directors in 1985.

Bo C. Helper, Turfgrass Agronomist with Senske Lawn and Tree Care in Yakima, will wear two hats having been elected treasurer while at the same time serving as the immediate past president and ex officio member of the board of directors.

During the business meeting of the members, Thomas W. Cook, a Turfgrass Specialist with the OSU Horticulture Department; William J. Johnston, Agronomist with the WSU Department of Agronomy and Soils; and Richard E. McCoy, a Golf Course Superintendent at Glendale Golf and Country Club in Bellevue were each elected to three year terms on the NTA Board of Directors.

1988 Northwest Turfgrass Conference Preparations

Planning for the next conference, the 42nd Northwest Turfgrass Conference, is already well underway. The dates of the conference are September 19-22, 1988. Get them on your calendar now. Efforts are underway to make the education program next year even better than those in years past.

The conference headquarters hotel will be the Spokane-Sheraton Hotel and, just a short walk away, the 40,000 square foot Spokane Convention Center has been reserved for the largest and best trade show yet at an NTA conference. We hope to see you there!

President's Corner

James R. Chapman
President

There aren't too many ways the past conference could have been better. The fog outside could have lifted before the last day, but inside the speakers were bright and stimulating. This amount of information presented from such knowledgeable sources is almost too much to remember. Fortunately it is all written down for you in the *PROCEEDINGS* to be mailed soon. Use this reference source often during the coming year.

While we tend to focus on the NTA Conference each year, as you would expect, I want you to keep in mind other regional seminars or conferences which further extend your knowledge. The Oregon GCSA will sponsor an equipment show and a pesticide applicator seminar in Portland, December 8-10. The Northwest GCSA puts on a compact all-day program, worth about eight hours of pesticide credit, in January and it has been open to non-golf turf professionals. The Inland Empire GCSA started a trade show which got off the ground with a bang last February and they plan to repeat it next February.

For information on these meetings and other pertinent matters, keep in contact with your regional NTA directors or the NTA office. We all work for you and share a common interest in whatever works to improve turf. The NTA Northwest Turfgrass Conference program is already being formulated for next year in Spokane under the guidance of Dr. Bill Johnston. Your comments and suggestions gleaned from the questionnaire at the conference will definitely help.

My sincere thanks extend to Mark Snyder and the people at Salishan for their hospitality during the conference. The help of the other directors in planning and coordinating the program was beyond value. Bo Helper led the board with his strong and well organized guidance throughout the year. And, how do you ever say thanks enough for the help Dr. Roy Goss has given us over all these years? We tried with a few inadequate gifts and much laughter at the roasting during the conference. If you get a chance, let Roy know how much you appreciate his availability and support. You only have a few more months.

In spite of the many issues facing the board of directors, ranging from possible changes in dates and sites for future conferences to revision of the bylaws. I expect this to be a good year. We have a good bunch to work with, all eager to help. We have some extra research and scholarship money, thanks to Wally Staatz. And we certainly have an organized office operation headed by Blair Patrick of *Organization Management*, who now functions as our Executive Director.

The NTA Board of Directors
and Staff wish you
a Happy Thanksgiving,
a Merry Christmas
and a
Prosperous New Year!

Northwest Turfgrass Happenings

Jeff Mason, who was assistant golf course superintendent at Lake Oswego Country Club, is now golf course superintendent at Tumwater Valley Golf Club.

Congratulations to **Andrew Soden** who successfully completed the requirements of the GCSAA certification program recently earning the right to use the title Certified Golf Course Superintendent (CGCS).

William Griffith, who was in business for himself in Gresham, Oregon is the new golf course superintendent at the City of Walla Walla Veteran's Memorial Golf Course.

R. Terry Buchen, CGCS, who was golf course superintendent at the Everett Golf and Country Club is the new golf course superintendent at the Broadmoor Golf Club in Seattle, Washington.

Mike L. Kingsley, who was golf course superintendent of the Coeur d'Alene Golf Club is now superintendent of the Spokane County MeadowWood Golf Course in Liberty Lake, Washington (currently under construction).

Update on Fine Fescues

By: Tom Cook

Does it really matter which fine fescue you choose for use in mixtures on low maintenance turf areas? For a long time the answer was probably no, but it looks like things are changing. One obvious change is the development of disease resistant cultivars. As the data which follows demonstrates, there are major differences in susceptibility of fine fescues to red thread disease. In general, hard fescues are highly resistant to red thread, while creeping red fescues are highly susceptible. Chewings fescues as a group are intermediate but some cultivars are relatively resistant while a few are quite susceptible. Since red thread definitely reduces turf quality, it makes sense to look for resistant cultivars in selecting grasses.

Red Thread Ratings of Fineleaf Cultivars (1986 Data)
National Variety Trials
Red Thread Ratings 1-9; 9 = No Disease

Name	Type	NY1	NY2	OR2	VA1	Mean
Aurora*	Hard	9.0	9.0	8.3	6.7	8.3
Waldina*	Hard	8.7	9.0	8.3	7.0	8.3
Reliant*	Hard	8.7	9.0	8.7	6.7	8.3
SR 3000*	Hard	8.7	9.0	8.3	6.7	8.2
Biljart*	Hard	9.0	9.0	8.0	6.3	8.1
Scaldis*	Hard	9.0	9.0	8.0	6.3	8.1
Bar FO 81-225	Hard	8.7	8.7	8.0	6.0	7.8
Waldorf*	Chewings	8.0	8.7	8.3	6.3	7.8
Spartan*	Hard	6.7	9.0	8.7	7.6	
Magenta	Chewings	8.0	8.7	7.0	6.0	7.4
Center	Chewings	8.7	8.0	7.3	5.7	7.4
Epsom*	Chewings	8.3	7.7	7.7	5.7	7.3
Bighorn*	Sheep		9.0	7.7	5.3	7.3
Ivalo	Chewings	8.0	7.3	8.0	5.0	7.1
Banner*	Chewings	8.0	8.3	7.0	4.7	7.0
Victory*	Chewings	7.7	9.0	7.0	4.3	7.0
Enjoy*	Chewings	8.0	8.3	6.0	5.7	7.0
Tamara	Chewings	7.7	8.3	7.3	4.7	7.0
Pennlawn*	Creeping Red	6.7	8.3	7.3	5.0	6.8
Mary*	Chewings	8.3	8.0	6.7	4.3	6.8
Beauty	Chewings	7.7	8.0	5.3	6.0	6.8
Shadow*	Chewings	8.0	8.3	6.0	4.3	6.7
Weekend	Chewings	7.0	7.3	7.7	4.7	6.7
Longfellow	Chewings	7.0	9.0	5.3	5.0	6.6
Jamestown*	Chewings	8.0	8.7	5.7	4.0	6.6
Koket*	Chewings	8.0	7.7	5.7	4.7	5.5
Wilma	Chewings	6.7	8.7	6.0	4.7	6.5
Boreal	Creeping Red	8.0	8.3	5.0	4.3	6.4
Commodore	Creeping Red	8.7	7.7	4.3	4.3	6.3
Wintergreen*	Chewings Red	7.0	5.3	7.3	5.3	6.3
Lovisa	Creeping Red	8.0	6.3	5.0	5.3	6.2
Pernille	Creeping Red	6.0	7.7	6.3	4.7	6.2
Highlight*	Chewings	7.3	4.7	7.0	5.0	6.0
Unknown	————	4.7	9.0	5.3	5.0	6.0
Logro	Slender Creeper	8.0	1.0	8.7	6.0	5.9
Robot	Creeping Red	5.7	7.7	5.0	5.3	5.9
Checker*	Chewings	6.3	6.3	5.3	5.7	5.9
430	Creeping Red	7.3	7.7	5.0	3.3	5.8
Tatjana	Chewings	6.7	5.7	6.0	4.3	5.7
Ruby	Creeping Red	6.7	8.0	3.7	4.0	5.6
Atlanta*	Chewings	7.3	5.7	5.7	3.7	5.6
Flyer*	Creeping Red	7.7	7.7	3.0	3.0	5.3
Ceres	Creeping Red	5.0	6.7	4.3	5.0	5.3
Estica*	Creeping Red	6.7	4.7	5.7	4.0	5.3
FRT-FRT 83-1	————	5.0	4.7	5.3	5.7	5.2
Ensylva*	Creeping Red	2.7	8.3	4.3	3.0	4.6
LSD Value 1/		2.3	1.6	1.9	1.2	0.9

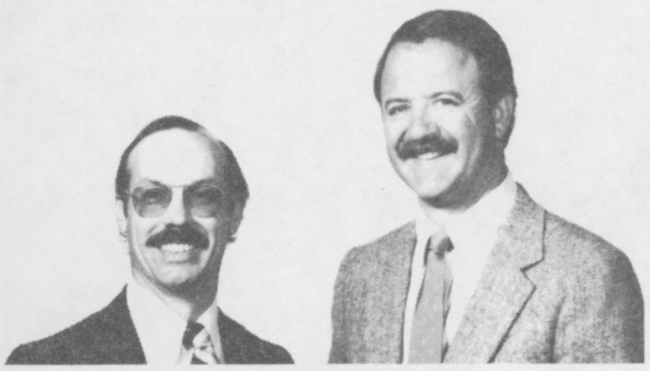
*Generally available for purchase.

1/ To determine statistical differences among entries. Subtract one entry's mean from another entry's mean. Statistical differences occur when this value is larger than the corresponding LSD value (LSD 0.05).

Turf Scholarships

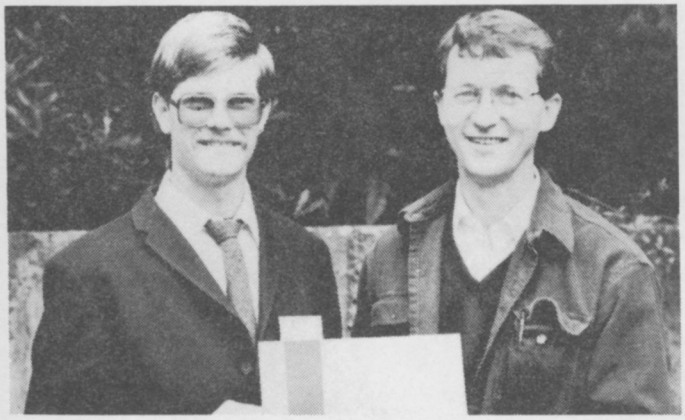
Charles Buffet receives a $500 scholarship from Seed Research of Oregon President Mike Robinson. Buffet is a student at Oregon State University, majoring in horticulture and turfgrass management with special emphasis on journalism.

The Seed Research of Oregon, Inc. Turf Scholarship will be given annually to a junior, senior, post-baccalaurette or graduate student who has demonstrated outstanding work in the study of turfgrass management and plans to enter the turfgrass field upon completion of his or her degree.



Charles Buffet and Mike Robinson

Todd Lauble, a senior majoring in Horticulture at Oregon State University, was awarded a $500 NORAM Scholarship by Tom Cook of OSU at the 41st NTA conference in Salishan on the Oregon coast. Todd was recognized for his scholastic performance and his interest in becoming a golf course superintendent. He recently completed his six month internship at San Luis Obispo Country Club in San Luis Obispo, California. Todd is shown here with Tom Cook who is the turf instructor at Oregon State University.



Todd Lauble and Tom Cook

NTA Committee Chairs Selected

The standing and special committee chairs selected to serve in 1987-88 include:

Executive and Finance ..... James Chapman
Nominations ..... Bo Helper
Conference Commercial Exhibit ..... Ken Weiderstrom
Conference Program ..... William Johnston
Conference Golf Tournaments ..... Mike Kingsley
Conference Scheduling & Site Selection ..... Mike Kingsley
Conference Spouse Program ..... Laura Kingsley
Membership ..... Tom Cook
Public Relations ..... Norm Whitworth
Publications ..... Tom Cook
Research and Scholarship ..... Randy Shults

Position Openings

Golf Course Superintendent — Yakima Elks 18 hole course. Contact: (509) 575-2800 (Howard Powell).

Maintenance Superintendent — Tapps Island Association. Contact: (206) 862-6616 (Michael Comer).

1987-88 NTA Regular Business Meetings Schedule

Date	Event	Site
Sept. 24, 1987 (Thursday)	Board of Directors Regular Meeting	Salishan Lodge, Glenedon, OR (503) 764-2371/1-800-547-6500
Nov. 24, 1987 (Tuesday)	Board of Directors Regular Meeting	Tyee Hotel, Tumwater, WA (206) 352-0511/1-800-648-6440
Jan. 4, 1988 (Monday)	Board of Directors Regular Meeting	Tyee Hotel, Tumwater, WA (206) 352-0511/1-800-648-6440
March 8, 1988 (Tuesday)	Board of Directors Regular Meeting	Tyee Hotel, Tumwater, WA (206) 352-0511/1-800-648-6440
June(TBA),1988	Board of Directors Regular Meeting	Tyee Hotel, Tumwater, WA (206) 352-0511/1-800-648-6440
Sept. 18, 1988 (Sunday)	Board of Directors Regular Meeting	Sheraton-Spokane hotel Spokane, WA (509) 455-9600/1-800-848-9600
Sept. 21, 1988 (Wednesday)	Membership Annual Business Meeting	Sheraton-Spokane Hotel Spokane, WA (509) 455-9600/1-800-848-9600
Sept. 19-22, 1988	**42nd Northwest Turfgrass Conference & Exposition**	**Sheraton-Spokane Hotel Spokane, WA (509) 455-9600/1-800-848-9600**

What Is the Northwest Turfgrass Association?

The NTA is a nonprofit corporation founded in 1948 to help all people interested in turfgrass culture. The association now has grown to over 400 people involved in turf maintenance at schools, parks, golf courses, cemeteries, 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 professions. Its annual conference and the periodic publication of its newsletter 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 is directed by its membership through a board of directors. The board encompasses all fields and geographic areas throughout the Pacific Northwest. Board members are elected at the general membership meeting of the annual conference, and serve three year terms. Active participation by members is encouraged so that the organization will reflect their needs and wants.

NTA Membership Benefits

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 chemicals as displayed at the conference by suppliers throughout the region.

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.

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Clip and mail to: NTA, P.O. Box 1367, Olympia, WA 98507 (206) 754-0825

Application for Membership

Name _____ Date _____

Mailing Address _____ Bus. Phone (_____)

City _____ State _____ Zip _____

Name of Business _____

Student at _____ FR___ SO___ JR___ SR___

Membership Category:

Regular . . . . . $75.00 annually Student . . . . . $15.00 annually

(Dues must accompany membership application.)

Making Fungicides Work for You

By: Tom Cook

As the winter disease season comes upon us this is a good time to review fungicides and make sure you use them properly to get good disease control. What follows is a brief summary of important points made by Dr. Smiley at the 40th NTA conference in Pasco, Washington. For more in-depth information, I suggest you reread Dick's paper in the conference proceedings.

Modes of Action

Contact fungicides: As a group these broad spectrum chemicals inhibit respiration or other energy production processes. Since most of these materials do not enter the plant tissue, they must come in direct contact with fungi on the plant surface in order to be effective.

Systemic fungicides: These materials can enter the plant and actually kill fungi which have invaded plants and initiated disease. They kill fungi by inhibiting synthesis of vital biological compounds or structures.

Fungicides which move only a short distrnce into plant tissue are considered locally systemic. These materials behave much like contact fungicides and are often considered "narrow-spectrum protectants."

Fungicides which move considerable distances from absorption sites can be considered truly systemically translocated.

Translocation

To get the best performance from systemic fungicides, it is important to know their pattern of translocation. Many systemics move from their point of uptake toward the leaf tips. This is termed "acropetal" translocation. Other systemics move from the point of absorption down to the crown or roots. This is termed "basipetal" translocation. Some fungicides move in both directions but in such cases, acropetal movement is the most important means of translocation.

How you apply these fungicides determines how effectively they will do their job. For instance, if you are trying to control root infecting fungi with benomyl, you'll have better results if you water the fungicide into the crown and root system zone than if you simply spray it on the foliage. If you leave it on the foliage, it will move to the leaf tips without ever reaching the roots.

Fungicides which are basipetally or both acropetally and basipetally translocated are not as sensitive to application method as those which are only acropetally translocated.

Fungal Resistance to Fungicides

Contact fungicides have many modes of action and are not dependent on any one process for their effectiveness. As a result, it is rare that fungi develop resistance to these materials.

Systemic fungicides which have very specific modes of action are very effective but tend to become ineffective over time because resistant fungal populations build up. Once resistance develops for a specific fungicide, other fungicides with the same mode of action will also become ineffective. The classic example is benomyl. Fungi resistant to benomyl are also resistant to thiophanate fungicides. Other groups with similar modes of action and thus the potential for cross tolerance include 1) iprodione and vinclozolin and 2) fenarimol, triademefon, propiconazol, and prochloraz.

The actual risk of resistance developing to fungicides varies and can be ranked as follows:

High Risk: benomyl, thiophanate, metalazyl. Moderate Risk: oxycarboxin, iprodione, vinclozolin. Low Risk: fenarimol, triadimefon, prochloraz, propiconazol.

Application Strategies

Surface protectants: Contact fungicides are only effective against fungal spores or hyphae on the leaf surface or in the upper thatch. Uniform application is critical to insure effective disease control. High spray volumes assure thorough coverage. Sprays must be applied often to compensate for new growth and loss of fungicide due to mowing and degradation. Frequencies of 4 to 14 days are common. Most contact fungicides are available as wettable powders due to low water solubility. Granular formulations are inefficient for these fungicides because of the difficulty in achieving uniform coverage.

Systemics: These fungicides must be applied accurately due to the potential for phytotoxicity at excessive rates. Materials which translocate acropetally (to leaf tips) should be drenched into the soil to gain maximum results. Materials which move both acropetally (to leaf tips) and basipetally (toward the roots) can be applied as foliar sprays. Where drenching is done, it should be thorough and the water should be applied before the fungicide can dry on the foliage. Once these fungicides dry, they generally are tightly absorbed and won't wash off. Systemics work well in granular form.

Avoiding resistance: To avoid resistance, it is important to minimize the exposure of pathogen populations to a particular fungicide while maintaining acceptable disease control. To achieve this, you can follow several basic rules.

1. Avoid using fungicides against diseases which are not damaging. Preventative applications increase the risk of disease resistance.

2. Whenever possible, use fungicides which have the least risk for developing resistance and use minimum rates and frequencies.

3. Use high risk fungicides infrequently and only when absolutely necessary for disease control.

4. Avoid drenching applications of systemic fungicides unless absolutely necessary. Drenching allows continuous uptake of the fungicide which favors uninterrupted selection pressure for resistant pathogens.

5. Mix fungicides whenever possible. Theoretically the most effective approach is to alternate surface protectants with mixtures of a surface protectant and a systemic. The next best program is to always use a mixture of contact and systemic materials. Also effective is a program of alternating systemics with surface protectants. The worst case would be to repeatedly use systemic fungicides alone.

6. When rotating fungicides, avoid using systemic compounds with similar modes of action. For example, never alternate benomyl with thiophanate or triadimefon with fenarimol.

7. Integrate chemical disease control with sound cultural practices and disease forecasting to avoid the need for consistent fungicide use.

The tables following list currently available fungicides and outline important characteristics and trade names for them.

Reference

Smiley, R.W. 1986. *Efficient Use of Fungicides on Turfgrasses.* Proceedings of the 40th Northwest Turfgrass Conference. pp 55-78.

TABLE 1.
Protectant Fungicides Used to Control Turfgrass Diseases

Classification	Common Name	Trade Name	Solubility in water (per L.)
Broad-spectrum Surface Protectants	anilazine*	Dyrene, Scott's No. III	◄ 1mg
	cadmiums, inorganic	Cad-ex, Caddy	1.5kg
	cadmiums, organic	Cadminate	◄ 10g
	captan	Captan, Orthocide	3mg
	chlorothalonil*	Bravo, Daconil, Scott's 101V	1mg
	maneb	Tersan LSR	◄ 1mg
	mancozeb	Dithane M-45, Fore	◄ 1mg
	mercurous chloride*	Caloclor, Calogran	2mg
	phenylmercuric acetate	PMA	4g
	phenylmercury dimethyldithio-carbanate	PMAS	6mg
	thiram	Thiram, Tersan 75,	30mg
	zineb	Zineb	10mg
Narrow-spectrum Locally Systemic Protectants	chloroneb*	Tersan SP, Scott's No. II	8mg
	cycloheximide	Actidione TGF	21g
	etridiazole (ethazole)	Koban, Truban, Terrazole	50mg
	fenaminosulf	Dexon, Lesan	25g
	quintozene*	PCNB, Terraclor, Scott's FFII, Lawn Disease Preventor	◄ 1mg

TABLE 2.
Systemically Translocated Fungicides Used to Control Turfgrass Diseases

Spectrum of Activity	Common Name	Trade Names	Movement+	Solubility in water (per L.)
Broad	benomyl*	Belate, Tersan 1991	A1	4mg
	fenarimol	Rubigan	B1	14mg
	iprodione*	Rovral, Chipco 26019, Scott's No. VI	A2,B?	13mg
	prochloraz**	Sportak	B1	47mg
	propiconazol	Tilt, Banner	B1	110mg
	thiophanates*	Fungo, Topsin,	A1	◄20mg
	triadimefon*	Bayleton, Scott's No. VII	B1	260mg
	vinclozolin	Ronilan, Vorlan	A2,B?	1g
Narrow	denodanil**	Benefit	B1	20mg
	furmecyclox**	Camprogran, Epic	A1	250mg
	metalaxyl*	Ridomil, Subdue	B1	7g
	oxycarboxin**	Plantvax, Ring Master	A1	1g
	phosethyl A1	Aliette	B1	122g
	propamocarb	Previcur, Banol	A1	700g

* *Products formulated as granulars as well as wettable powders.*

** *Products not commercially available at the time of manuscript preparation.*

\+ *Translocation (A) acropetally or (B) both acropetally or basipetally, and (1) rapidly or (2) slowly in the acropetal direction.*

Here Come the Worms

By: Tom Cook,

Every year worms or more properly worm casts become a topic of conversation once temperatures drop and the fall rains begin. During the wet times of the year, worm casts ruin the appearance and playability of fine turf areas particularly on golf courses. In homelawn situations or general turf, they make the surface bumpy. If it's your job to maintain smooth, uniform, and beautiful turf all year long, there is a good chance you will consider controlling earthworms somewhere along the line.

Earthworm control is a difficult subject to discuss. First, we could argue forever whether or not it is even advisable to kill these animals. My personal opinion is that they do far more good than harm, so I prefer to encourage them. Still, I sympathize with people struggling with worm casts on putting greens or approach areas. Second, there aren't any chemicals registered for control of earthworms, so technically there is nothing to say.

Instead of talking about control, perhaps it is best to simply consider how various cultural practices and chemical treatments affect earthworms. Based on this information you can design your program to either encourage or discourage earthworm activity.

Grass species: Not a lot is known about feeding preferences of earthworms as far as grasses are concerned. However, there is some evidence that *Lumbricid* species may prefer or at least thrive on debris from perennial ryegrass. In Corvallis I have observed considerably more worm casts in perennial ryegrass plots than in adjacent bentgrass plots even though both grasses were growing in the same soil, with the same pH, and received the same fertilization and mowing treatments.

Soil pH: Common earthworms can tolerate a wide range of soil pH levels. *Lumbricid* earthworms can survive pH's ranging from 3.7 - 7.0 (Lee 1985). Despite their apparent tolerance of soil acidity, *Lumbricid* species may be eliminated when ammonium sulfate is consistently used as a nitrogen source. The assumption is that ammonium sulfate lowers soil pH below the range tolerated by worms (Lee 1985). Liming acid soils may stimulate earthworm activity, particularly when soil pH is below 4.5 - 5.0 to begin with (Edwards and Lofty 1977).

Chemicals: Lee (1985) summarizes the effects of 84 chemical compounds on earthworms. I have selected out some of the more commonly used chemicals along with appropriate comments. Chemicals listed are included only for the sake of discussion. There is no intention on my part of encouraging their use. All of these chemicals should be used only as stated on the label.

Insecticides

1. Chlordane: Very toxic to earthworms. At commonly used rates, can eliminate earthworms in two months. Has a long residual effect.
2. Chlorpyrifos: Probably not toxic to worms at normal dose rates. Many organophosphates show little or no activity on earthworms.
3. Malathion: Non-toxic at normal dose rates.
4. Carbaryl: Very toxic to many earthworm species. High mortality via direct contact. Compared to other toxic chemicals, has a short residual control period.
5. *Bacillus Thuringiensis*: Probably not toxic at normal dose rates. May be some sensitive species.

Fungicides

1. Benomyl: Generally considered very toxic at normal use rates. Earthworms will not feed on heavily contaminated litter. *Lumbricus terrestris* is very sensitive but other species vary considerably.
2. Thiabendazole: Similar to benomyl.
3. Thiophanate-methyl: Similar to benomyl.
4. Mercuric chloride: Very toxic to earthworms.

Herbicides

None of the commonly used herbicides appear to be toxic to earthworms. Because non-selective herbicides eliminate plant debrii production, earthworm populations may decline over time.

Fertilizers

1. Ammonium sulfate: Toxic when applied to acidic soils. Has no effect on worms in neutral or alkaline soils.

Work in England (Woolhouse and Wright 1984) was aimed at reducing worm casts without eliminating worms completely. They found that benomyl, carbendazim, thiabendazole, and thiophanate-methyl reduced casting within one month of treatment with effects at high treatment doses lasting up to two years. None of their treatments suppressed casting completely. They concluded that annual treatments would probably be necessary in their conditions.

We need to understand earthworms better than we do. Where control is deemed necessary we need to develop treatments which will reduce casting without eliminating earthworms entirely. Research in this area should be priority.

References

Edwards, C.A. and J.R. Lofty. 1977. *Biology of Earthworms*. Second edition. Chapman and Hall, London.

Lee, K.E. 1985. *Earthworms: their ecology and relationships with soils and land use.* Academic Press, Orlando, Florida, 411 pp.

Woolhouse, A.R. and A.J. Wright. 1984. *An investigation of the effectiveness of various systemic fungicides in suppressing worm casting.* J. Sports Turf Res. Inst. 60: 96-98.

Northwest Turfgrass Association Goals

The NTA has three major goals:

1. Encourage research in the Pacific Northwest that will benefit turf managers throughout the region.
2. Support research by providing money for development of turfgrass research facilities at appropriate universities throughout the region.
3. Provide educational opportunities for turf managers through publications as well as annual conferences.

Since its beginning in 1948, the NTA has supported research on a wide range of subjects including: moss control, take all patch disease, fusarium patch disease, turfgrass nutrition, broadleaf weed control, grassy weed control, turfgrass cultivar evaluation, athletic field construction, renovation techniques, snowmold disease, growth regulators, and many others. Many of our standard practices and recommendations are based on results of these research efforts. All of this was made possible by member contributions in the form of annual dues and donations to the special research fund.

Much of this information is disseminated through the annual conference and the conference *Proceedings.* The NTA has the longest record of published *Proceedings of any association in the United States. 1987 marks the 41st consecutive year for both the conference and its Proceedings.*

Jennings and Morrison Memorium

Ed Jennings died rather suddenly of a heart attack on June 17,1987. Most of us will remember Ed as the outgoing and friendly golf course superintendent from Snohomish Golf Club at Snohomish, Washington.

Ed Jennings

Ed grew up on a ranch in eastern Montana and spent his early years in Montana and Wyoming. During World War II, the family moved to California where Ed worked in the Kaiser shipyards. After the war, the family moved to northern Idaho where Ed was welder for the Bunker Hill Mining Company for several years.

Ed and his wife, Edna, and family moved to Columbia (South America) for 18 months where he was a foreman on the Transcontinental Highway. Ed became very fluent in the Spanish language through his work in Columbia.

After their return to the U.S., the family made their home in Coeur d'Alene, Idaho until they moved to Kirkland, Washington in 1958. Ed worked as a mechanic and maintenance man at Overlake Golf and Country Club while he was learning the business of becoming a golf course superintendent. He stayed there until 1966. During this time, Ed and his family moved to Redmond where Ed had a mower repair and sharpening shop to keep him busy in his spare time.

In 1966, Ed went to work for the Richards family and was in charge of the construction of the Snohomish Golf Course. After the completion of the golf course, Ed stayed on as golf course superintendent until he retired in 1984.

Ed leaves his wife, Edna, two sons, a daughter and seven grandchildren. Edna still resides at the family home at 9717 - 167th Ave. NE, Redmond, WA 98052.

The Northwest Turfgrass Association extends its sympathy to Edna and the family. We shall all miss Ed very much.

Dr. Ken Morrison was honored with a retirement dinner at Pullman, Washington on September 19, and just 25 days later died of a heart attack at Deaconess Hospital in Spokane.

Ken Morrison was born on February 14, 1921 near Van Buren, Arkansas. He served in the Corps of Engineers during World War II and saw duty in England, France, Belgium and Germany. He completed his college education after World War II and eventually received his Ph.D. degree from Purdue University.

Ken spent his entire career — 37 years as Washington State University Extension Agronomist and traveled nearly a million miles to conduct educational programs for the university.

Two of the outstanding developments during his career were the start of the Columbia Basin Irrigation Project and introduction of short-strawed wheats bred at Washington State University by a team of scientists led by Dr. Orville Vogel. Ken was a specialist in cereal production and also worked with forage crops as well. Many of us will remember Ken with his contributions to the turfgrass industry where he was visible throughout his career. Ken Morrison also implemented in 1961 the first statewide computerized cereal testing program in the United States, which has served as a model for other states and international programs. Ken served as director and executive secretary of the Washington State Crop Improvement Association for 30 years, helping it to become one of the nation's leading groups of its kind.

Ken is survived by his widow, Ruth, at Pullman and two daughters and one grand daughter.

The Northwest Turfgrass Association extends its sincere sympathy to the family and recognizes the contributions of a great Agronomist.

Preventing Winter Desiccation of Turf

If you live in the cold parts of the PNW this looks like a good year for winter desiccation. The long dry fall means many turf areas will go into winter dry and if the winter is cold, open, and windy, dead turf will be the order of the day by next April. What can you do to avoid what seems to be inevitable? The answer is, take a good look at some type of winter cover.

We all remember when pine boughs or heavy topdressing were the only functional winter covers. Now there are a whole array of materials available including many different types of geotextile fabrics. Dr. John Roberts of New Hampshire found that lightweight spunbonded polyester blankets were better than other alternatives in his tests. Bentgrass covered with spunbonded polyester blankets generally had 10 to 20 percent more spring leaf moisture, up to 24 percent more root lengths, 80 percent more clippings, and up to 10°C higher soil temperatures than uncovered control plots. This hastened spring greenup by 5 to 12 days.

Polypropylene blankets tended to exclude light and caused stemmy chlorotic turf and lower spring temperatures.

Recent developments in turf covers include clear woven geotextile fabrics which provide benefits similar to the spunbonded polyester covers but are sturdier and may have longer lifespans than lightweight covers.

General guidelines to consider when using covers to prevent wider desiccation include:

1. Apply snowmold fungicides before putting covers on turf.

2. Leave covers on for as long as possible in spring to avoid color loss after removal. (One rule of thumb is to wait for three weeks after snow melt before removing covers.)

Reference

Roberts, J.M. 1986. *Influence of Protective Covers on Reducing Winter Desiccation of Turf.* Agron. J. 78:145-147.

Lifetime Honorary Membership

Dr. Ronald Ensign

Dr. Roy Goss

The NTA board of directors granted Lifetime Honorary Membership to Dr. Ronald Ensign and Dr. Roy Goss "in recognition of many years of faithful service toward the evolution of a better turfgrass industry."

Dr. Ensign, recently retired, worked with turf and forage grasses and legumes for several years after going to Idaho and worked with the University of Idaho beginning in 1952. He has been interested in turfgrass cultivar development and evaluations in cooperation with turf scientists throughout the country. He has worked with winter diseases of turf and management problems related to turf. A major part of his assignment at the University of Idaho was with forage grasses and legumes; breeding, management, and variety evaluations for seed production. In addition to his research responsibilities, he taught undergraduate and graduate students in forages and Turfgrass Science.

Dr. Roy Goss received his Ph.D. in Agronomy from Washington State University in 1960. He completed his requirements for his Ph.D. degree after accepting the Turfgrass Research and Extension position at the Western Washington Research and Extension Center at Puyallup on July 1, 1958.

He served a dual role in both research and extension positions until January 1, 1981 when he became full-time Turfgrass Extension Specialist. His significant research programs included complete nutritional investigations with emphasis on sulfur, their interaction with turfgrass diseases and field application. He also made extensive investigations in turfgrass weed control and specialized soil mixes for putting greens and sports fields.

Goss served as executive secretary of the Northwest Turfgrass Association from 1962 to 1987. He is an honorary member of the Northwest Association of Golf Course Superintendents, Inland Empire Association of Golf Course Superintendents and Western Canada Turf Association.

Wear Tolerance of Turfgrass Species

In a recent study in England researchers tested several turf grasses for wear tolerance utilizing a differential slip wear machine. Recognizing that wear tolerance is an ill defined term, the author considered wear tolerance to mean "the percentage ground cover remaining after wear."

Using the above criteria, the author found that *Poa annua* was consistently the most wear tolerant species in the test. Perennial ryegrass ranked second and compared to other grasses, remained relatively free from annual bluegrass contamination. "Baron" Kentucky bluegrass ranked third overall but was subject to encroachment by annual bluegrass. "Highland" bentgrass, "Highlight" chewings fescue, and "Boreal" red fescue ranked lowest in wear tolerance. Each of these three grasses was infested with annual bluegrass by the end of the test period.

The perennial ryegrass used in this trial was not a turf type ryegrass. The author cites other work which rates turf type ryegrasses higher in wear than common forage types. Had this test been conducted with an improved turf type ryegrass, the rankings may have varied.

Perhaps the remarkable result in this test is the high wear tolerance reported for annual bluegrass. This contradicts the commonly held opinion that annual bluegrass lacks wear tolerance.

The author also studied soil characteristics in this test. He found that wear treatments consistently increased soil bulk density and decreased total pore space from 47 percent in untreated turf to 42 percent in treated turf.

Sand Root Construction and Management

By: Roy L. Goss

Every turfgrass manager at schools, parks and golf courses should have in their files a reference copy of PNW Bulletin 0240 entitled "Construction and Maintenance of Natural Grass Athletic Fields." Golf course people may ask, "Why should I have a copy of an athletic field bulletin?" The answer is, the system being used for construction of first class athletic fields is almost identical with the construction of putting greens with respect to the sand root zone and drainage characteristics. This bulletin was developed and published by Roy Goss and Tom Cook in 1983 to provide information to turfgrass managers, landscape architects, landscape design contractors, and others interested in root zones with excellent drainage characteristics.

The specifications outlined in this bulletin will absolutely prevent any mistakes in construction and in subsequent maintenance of these first class facilities. There will be no such thing as "black layer" or anaerobic conditions when these recommendations and specifications are followed. Now we have come up with a fertilizer formula and program which will prevent nutrient deficiencies on a pure sand root zone with little or no cation exchange capacity nor supplied nutrients. You can ask your local fertilizer distributor for fertilizers containing small amounts of micro-nutrients which will supply turfgrass needs without becoming toxic to the plant.

The Bulletin Department at Washington State University campus is the repository for supplies of this bulletin, and I am recently informed by Mary E. Dey that we still have 1,625 copies of PNW 0240 in stock. Ms. Dey also reported that over the past two years we have used about 600 copies of this bulletin. I am constantly asked by phone and by letter to provide sand particle sizes and specifications for construction. This is rather redundant when the information has been published and publicized for over four years.

Take it upon yourself today to obtain copies of this bulletin. Copies of this bulletin are available in every county agent's office throughout Washington, Oregon and Idaho and from the Bulletin Departments at Washington State University, Oregon State University and the University of Idaho. For those of you wishing to obtain a copy in Washington, either call your local county agent or write to the Bulletin Department, Cooperative Extension, Cooper Publications Building, Washington State University, Pullman, WA 99164-5912 and ask for the bulletin by number — PNW 0240 — Construction and Maintenance of Natural Grass Athletic Fields. Cost is $1.50/copy. Please avail yourself of this bulletin and save yourself the trouble of trying to catch Roy Goss or Tom Cook to write out these specifications for you.

Maintaining Water Infiltration on Sand Based Turf

If you have ever managed sand based turf, you've probably noted that as time goes by infiltration rates decline. Occasionally sand based turf drains no better than the mudhole it was intended to replace. The cause of the problem is usually surface sealing due to accumulation of organic matter in and on the surface layer. To solve the problem you need to prevent this layer from developing or figure out a way to get water through it.

Recent work at the Sports Turf Research Institute on Bingley, England assessed three techniques for maintaining infiltration rates. Hollow tine coring and surface scarification (dethatching) were carried out as pre-season treatments. Spiking with solid vertical blades was conducted during the simulated playing season. Artificial wear treatments were used throughout the study on the "Loretta" perennial ryegrass turf. Between October 1982 and March 1984 prior to this study infiltration rates had declined from over 160 mm/hr. to near 5 mm/hr.

Results were quite dramatic. Dethatching had no influence on infiltration before or after wear treatments. Hollow tine coring increased infiltration before wear treatments. During wear treatments the effects of coring decline rapidly and during much of the test it was only slightly better than control plots receiving no treatments. Spiking with flat pointed blades (which penetrated five inches deep) approximately two times per week through the playing season consistently increased infiltration rates. The authors noted that even in the worst case spiking increased infiltration by a minimum of four inches per hour over control plots.

During the test, soil infiltration rates varied across treatments. This was attributed to the influence of frost on loosening up the sand in the surface layers.

The message here for managers of sand based fields is to make use of regular spiking before and during the fall and winter seasons to help maintain firm dry surfaces. The beauty of the slicing technique is that it is not disruptive and can be used at times when coring would be too messy.

Reference

Canaway, P.M., J.P. Isaac, and R.A. Bennett. 1986. *The Effects of Mechanical Treatments on the Water Infiltration Rate of a Sand Playing Surface for Association Football*. J. Sports Turf Res. Inst. 62: 67-73.

1987-88 NTA Board of Directors

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ADVERTISING/EDITORIAL DEADLINE 15th OF MONTH PRECEDING PUBLICATION

Calendar of Events

November 24	**NTA Board of Directors Meeting** — Contact Blair Patrick (206) 754-0825.
December 6	**Northwest GCSA Christmas Party** — Contact Ron Coleman (206) 825-3942
December 7	**Northwest GCSA Scramble Golf Tournament** — Contact Ron Coleman (206) 825-3942.
December 8-9	**Oregon GCSA A Pesticide Applicators Certification Seminar** — Contact Dick Malpass (206) 573-6969.
December 9-10	**Oregon GCSA Turf Equipment Show** — Contact Dick Malpass (206) 573-6969.
December 14	**Northwest GCSA Annual Pesticide Seminar** — Contact Ron Coleman (206) 825-3942.
January 4	**NTA Board of Directors Meeting** — Contact Blair Patrick (206) 754-0825.
January 18	**Northwest GCSA Annual Golf Course Staff Educational Seminar** — Contact Ron Coleman (206) 825-3942.
February 1-8	**GCSAA 59th International Golf Course Conference and Show** — Contact GCSAA 1-800/472-7878.
February 9	**Lilly/Miller Seminar on Maintenance/Renovation** — Contact James Chapman (206) 762-0818
February 16-18	**Inland Empire GCSA & WSU Inland Ornamental Seminar** — Contact Toni Fitzgerald (509) 456-3942.
February 17	**Inland Empire GCSA Inland Northwest Turf and Landscape Trade Show** — Contact Jones & Associates (509) 466-1486.
February 18	**Lilly/Miller Seminar on Maintenance/Renovation** — Contact James Chapman (206) 762-0818.
February 19	**Northwest GSSA Regular Meeting** — Contact Ron Coleman (206) 825-3942.
February 28 - March 2	**Western Canada Turfgrass Association Conference** — Contact Ken Warner (604) 434-5037.
March 8	**NTA Board of Directors Meeting** — Contact Blair Patrick (206) 754-0825.
March 18	**Northwest GCSA Regular Meeting** — Contact Ron Coleman (206) 825-3942.
June (TBD)	**NTA Board of Directors Meeting** — Contact Blair Patrick (206) 754-0825.
September 18	**NTA Board of Directors Meeting** — Contact Blair Patrick (206) 754-0825.
September 19-22	**NTA NORTHWEST TURFGRASS ASSOCIATION CONFERENCE AND TRADE SHOW** — Contact Blair Patrick (206) 754-0825.

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