

## What's New in *Poa Annua* Control?

Tom Cook

It's been almost a year now since we initiated our expanded research program here at Puyallup. As we decided at that time, my major input has been in the area of *Poa annua* control. Before explaining our progress this year, I feel it's important to set the stage and explain the general approach we feel is necessary to control *Poa annua* in the Pacific Northwest.

To be exact the problem isn't that we can't control *Poa annua*, we can, the real problem lies in developing a comprehensive cultural program that will enable people in the field to eliminate *Poa annua* without drastic measures. In simpler terms we need to develop a situation where bentgrass can live and *Poa annua* cannot. Because of our peculiar climate with its mild winters and generally cool summers this is not an easy problem to solve. Nevertheless, considerable progress has been made in the last ten years.

One big breakthrough in cultural control has been Dr. Goss's sulfur fertilization work. Specifically, he has found that levels and balance between N, P, and S strongly influence the amount of *Poa annua* that can survive in Astoria colonial bentgrass putting turf grown in a fine sandy loam soil. When N was applied at rates of 6 - 12 lb/1000, phosphorus eliminated, and sulfur applied at a rate of 3.45 lb/1000 annually, a severe reduction in *Poa annua* occurred when compared to other treatments. The sulfur effect cannot simply be explained by pH effects and is variable depending on rate. For example, sulfur applied at 1.15 lb/1000 stimulated both bentgrass and *Poa annua* with no reduction in *Poa annua* levels. This work indicates there is a critical level of S which must be reached and we suspect that level will be influenced by soil texture. New work with sulfur will be launched in 1976 to learn more about sulfur effects on sand base putting turf. The important point right now is that we can influence *Poa annua* by manipulating our fertility program. Additional research is currently under way to determine the influence of other cultural practices such as modified topdressing programs. We also hope to initiate research in 1976 on improved methods of overseeding to increase the chance of successful establishment.

Another breakthrough in recent years has been the development of safe and effective pre-emergence herbicides. In new putting turf these chemicals can be used to prevent infestation by *Poa annua*. In older turf they can be used to stop further spread. Based on work done by Dr. Goss on Highland colonial bentgrass putting turf, it is clear that *Poa annua* can actually be eliminated from putting turf by use of pre-emergence chemicals alone. For instance, when ben-sulide was applied at a level of 12 lb ai/acre in the fall

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## Pesticide Short Courses

By William P. A. Scheer, Area Extension Agent

A regional Pest Management Short Course has been scheduled for February 3, 4, 5 and 6, 1976 at the Sherwood Inn in Tacoma. The course offered by the Washington State University Extension Service will prepare pesticide-consultants, -applicators, -operators, -dealers and others for the various Washington State Department of Agriculture exam requirements. Those who are already licensed may attend the sessions for review purposes or prepare themselves for additional license categories. February 3 will be devoted to plant diseases. On February 4 the focus will be on insect control and February 5 on weed control. February 6 will cover pesticide chemistry, pesticide safety and laws and regulations with exams in the afternoon. Basics will be presented during the morning sessions while the afternoons will have in-depth discussions by research specialists on topics such as soil fumigation, bee pollination and poisoning, and weed control in ornamentals. Details regarding program and registration will be mailed out by writing or calling William Scheer, Area Extension Agent, 5601 Sixth Avenue, Tacoma, WA 98406, telephone 593-4190.

Basic pesticide short courses will also be offered in other areas of the state at the following locations and dates: Mount Vernon, February 5, 6 and 9; Chehalis, March 15 and 16; Vancouver, February 20 and 21; Yakima, January 19; Wenatchee, January 7 and 8; and Spokane, January 7, 14, 21 and 28. Contact the Cooperative Extension Service in those cities for further details.

**Note:** These short courses should not be confused with other pesticide short courses offered by WSU this season in almost every county to prepare the private applicator (farmer) for certification when he uses certain restricted use pesticides. Contact the local County Agent for details on such courses.

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## U.S. Golf Association Annual Conference

To those of you who may not have been informed regarding the United States Golf Association's annual conference, I would like to call your attention to this meeting. The USGA will be holding its annual conference on golf course management at the Biltmore Hotel, Madison Avenue and 43rd St., New York City, on Friday, January 30, 1976. The conference subject for the 1976 session will be "Getting the Most from the Club Dollar in 1976". Those of you who are suffering from recession and inflation may find that this conference could result in a considerable saving to your golf clubs next year and in years to come. This should be brought to the attention of your club management in case anyone should be able to attend this meeting. Additional information can be obtained from Mr. Bill Bengeyfield, Western Director, United States Golf Association, Green Section, 222 Fashion Lane, Suite 107, Tustin, CA 92680.



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## Northwest Turfgrass Association Board Meeting

The directors of the Northwest Turfgrass Association met at the Western Washington Research and Extension Center at Puyallup, Washington on December 16, 1975. The main items on the agenda were developing the conference program for 1976 and discussions centering around membership and finance committee reports.

The majority vote of the directors indicate their desire to have the conference in Spokane in 1976; therefore, arrangements are being made at the Spokane-Sheraton for this conference on September 28 to October 1, 1976. You can assume that this is a firm date and place and start making your plans accordingly for the conference in Spokane next year.

An interesting program for this conference was roughed out by the program committee chaired by Clayton Bauman and assisted by Roy Goss with inputs from all other directors. We promise an interesting and lively program and I think you will find that activities in and around Spokane will be most desirable.

## Winter Damage to Turfgrass Areas

By Roy L. Goss

Each year I issue certain precautions to all turfgrass managers with regard to winter playing conditions. Serious damage can be caused by excessive use or sometimes even moderate use of turfgrass areas under certain conditions during winter months.

There are certain factors that should be strongly considered by all turfgrass managers whether they are managers of playfields or golf course areas. Primary to any other considerations, the turfgrass manager should prepare his turf to be in the highest degree of vigor and density prior to the onset of fall and winter conditions. This would include previous overseeding, adequate nutrition programs, thorough aeration and repair of soft or unstable areas and other good management factors prior to the onset of winter. Some of the winter factors that could be considered can be enumerated as follows:

1. Frosted leaves — although traffic on turf that has frost on the leaves does not result in permanent death of the plants as a rule, there is extensive tissue damage due to ice formation within the cells that may leave brown tracks after the turf has thawed out. Obviously, if traffic is intense, it is possible that entire playfields of putting greens can sustain severe damage; therefore, it is wise to exclude the use of these fields or putting greens until the frost has melted off. You must remember that turfgrass growth rate has slowed down or even ceased under these temperature conditions and that recovery from injury is extremely slow, and if this type of activity continues, there can be significant loss in turfgrasses or weakened stand and prepare the way for invasion of unwanted species such as *Poa annua*.
2. Frozen soil — if snow cover follows frozen soil conditions, we have little worry because most playfields and golf courses are unused during these times. However, if the conditions are such that the soil is frozen with no snow cover and play continues, extensive damage can be produced. In addition to the shearing action to frozen grass blades, there is even more severe damage caused to the crowns of the plants. The degree of injury is a straight line function of the amount and type of traffic. It is recommended that play be excluded from turf grass areas except under unusual circumstances, such as the last remaining football game of the season.
3. Thawing conditions — perhaps some of the most severe injury to turfgrass areas can be caused when frost has penetrated several inches into the soil followed by thawing conditions. In this case, the surface thaws first usually caused by warm rains or rapidly rising temperatures while frost remains at depths below one inch. Water will not penetrate through frozen soil and accumulates in the upper surface causing essentially fluid conditions. Excessive traffic under these conditions can result in shearing of grass roots, extensive crown damage, and serious disruption to surface soil conditions. In addition to the extensive repair required to bring the grass back to vigor, an additional tremendous amount of labor and materials will be required to bring the surfaces back

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## Thatch Patch

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### Jim Chapman

By now you probably know that Gerrit Gersen is superintendent at Royal Oaks Country Club, Vancouver, WA. Ben Kern has moved from Tualitin to the Everett Golf and Country Club. Mike Gregg has returned to the superintendent ranks at Orchard Hills at Washougal, WA. Herb Tinker is now superintendent at Braeburn, Redmond, WA, replacing retired Loy Requilman. Herb, not just incidentally, is another graduate of the Ron Proctor Proving Grounds with a 7-year apprenticeship behind him.

I don't know yet who will be taking over at the Tualitin Country Club or Bend Golf Club — or whether Joe Lymp will be hiring his own replacement some day. Joe has been booted upstairs at Sunriver to something like Director of Operations. Congratulations, Joe, I think.

Mostly I mention names of superintendents in new positions in this column. This ignores some other important changes in the service industry. It was a pleasure to say "Hello" to Stan Bailey again the other day. Stan is the Sales Representative in the strong stable of Tom Baltz and Son, Jacobsen dealer in the Portland area. Stan gained a sturdy background of experience on golf courses up to the position of superintendent at High Cedars Golf Club, Orting, WA. Keith Gardner, another superintendent moved into sales recently, is with Turf and Toro, Seattle. Keith turned Glendale Golf and Country Club at Bellevue over to Rick McCoy when he made the move.

A couple of other topnotch assistant superintendents moved up to the first chair recently. Keith Pegg has left Sunriver for Fircrest Golf and Country Club, Tacoma, and David Lyman moved from Rogue Valley at Medford, OR, to the Willamette Valley Golf and Country Club at Canby. Oh gosh, don't let me forget Manito Country Club, Spokane. Cliff Everhart has retired and Tom Wolfe has stepped in. Tom was most recently at the Playboy Club in Wisconsin, and before that at Esmerelda Golf Course in Spokane.

Other welcome new faces are Duane Andrews, owner/operator of Olalla Valley Golf Course, Toledo, OR, Skip Schmock at Forest Hills Country Club, Reedsport, OR, and Steve Wilson at Wing Point Golf and Country Club, Bainbridge Island, WA.

See you next trip.

to uniform conditions required by the sport. Sports areas that are constructed from soils other than sand are even in worse trouble. Structural breakdown of this type of soil can be rather permanent and may require complete removal and replacement. Putting greens can be rejuvenated through aerification and extensive topdressing and overseeding, but nevertheless, the structural breakdown is damaging and may be there for a long time. In the case of football fields, this structural breakdown generally results in permanent loss of the surface because most schools cannot afford the intense management required to reestablish these fields.

4. Dessication injury — while we can exclude use or traffic on turfgrass areas due to frosted or frozen conditions, it is the hard freezing accompanied by wind without snow cover that can cause a tremendous amount of damage to turfgrasses and turf managers should be on guard for this condition. On large turfgrass areas where this phenomenon occurs only infrequently, it is difficult to prepare yourself against this problem. It may be reasonable to apply a small amount of water to frozen bare surfaces to prevent complete dessication of leaves and crowns if methods are available to you to carry out this procedure. Smaller areas could be covered with polyethylene sheeting provided you are equipped to handle the material and keep it in place. There are a number of other methods such as mulching with various materials, but only rarely would this become necessary in the coastal areas of western Washington, Oregon and British Columbia, and most often, the eastern part of the same areas generally have adequate snow cover to prevent dessication.

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Except in a few instances, contributions to the fund are coming in very slowly. It is very important that those of you who have not made a contribution and can possibly do so get in on the action if we are to maintain our increased turfgrass program. As it stands now, there are insufficient funds to maintain Tom Cook's position through 1976.



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## Appreciation for a Job Well Done

The editor has come upon a letter from a club president to the golf superintendent and his crew for performing outstanding service to the golf club and for course preparation for a tournament, and the editor feels that a letter such as this should be published. All too often the superintendent gets his lumps and criticisms and too frequently little praise for a job well done. The letter as follows will provide the details:

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followed by 3 lb ai/acre every three months, *Poa annua* was nearly eliminated from putting turf over a five year period. Under test conditions with turf growing on a fine sandy loam soil no apparent reduction in rooting occurred during this time. Single applications of bensulide at 15 lb ai/acre applied in the fall were not successful in reducing *Poa annua*. The reduction in *Poa annua* from annual repeat applications may indicate some post-emergence activity from the bensulide since a recent survey found that nearly all *Poa annua* types in putting turf in western Washington are perennial types.

As with the fertility work, more pre-emergence testing is planned for 1976 to determine rates and timing factors on sand base putting turf. This work will enable us to make better recommendations for use of pre-emergence herbicides on sand base turf. In addition to the standard pre-emergence herbicides presently available, several experimental chemicals are now being tested and look very promising. These chemicals could add versatility to any pre-emergence program and will be a welcome addition.

So far, the missing link in *Poa annua* control has been the lack of a selective post-emergence herbicide. A good post-emergence chemical could help reduce the need for annual repeat applications of pre-emergence herbicides. Used in concert with fertilizer and pre-emergence programs it could speed up the transition period a great deal. In large areas where pre-emergence control might be too expensive a combined program using altered fertility and post-emergence control might be the best alternative. One instance where post-emergence control would not be desirable is where the turf is nearly all *Poa annua*. On the other hand if an effective means for *Poa annua* control is devised, people with *Poa* greens might be encouraged to replace them with improved bentgrasses knowing *Poa annua* could be kept out later. In my mind there is no question that a good post-emergence herbicide could aid the cause greatly.

Like many things this appears to be a case where we have the technology but need to learn the best way to use it. A good example is the herbicide 'Endothal'. Tests going back to the early 1950's clearly show Endothal has potential for selective *Poa annua* control. Some of the best work with Endothal was done by McMaugh (1970) in Australia. He found it relatively safe and effective when used at low rates on colonial and creeping bentgrass. All his tests were done in mild weather with temperatures below 70°. Around the same time Turgeon (1972) used Endothal on both Kentucky bluegrass and creeping bentgrass. His results were complicated by rates and seasonal influences. The key in his work seems to be the effect of summer heat stress on plant response to the herbicide. Turgeon went so far as to establish the basis for selectivity which he determined to be greater absorption of Endothal by *Poa annua* and greater sensitivity of photosynthesis and respiration to Endothal. As McMaugh had done earlier, he noted that annual biotypes were easier to control than perennial types.

While work such as the above shows potential for Endothal, it is very clear that a great deal of refinement is necessary before an effective system of control can be offered. Therefore, starting in 1975 a series of detailed, systematic experiments were initiated to determine rate and

timing factors, environmental influences, species tolerance, and compatibility of Endothal with various chemical and cultural control methods.

Tests in 1975 were conducted on various turfs containing Kentucky bluegrass, red fescue, colonial bentgrass and creeping bentgrass. All tests on bentgrass were conducted on putting turf and all bluegrass and red fescue tests were on 1½ inch turf. Five separate rate tests were conducted between April and October. From these tests at least three rates warrant more testing on the bentgrasses and the bluegrass. However, nearly all rates caused severe phytotoxicity to red fescue.

No seasonal effects were observed on putting turf in 1975, a year marked by mild temperatures. However, in bluegrass the best results came from midsummer and fall applications, times when the bluegrass was growing vigorously. In this area bluegrass is slow to initiate growth in early spring and Endothal applications are less effective then. In fact repeated application in the spring caused thinning of the bluegrass turf.

Three different tests were conducted to determine the effects of repeat applications on selective control. Low rates were ineffective even when repeated as many as 5 times at two week intervals. Higher rates that caused selective injury to the *Poa annua* initially, caused increasing injury to all grasses with more than one application. Intermediate rates resulted in best control from 2-4 repeat applications. Red fescue could survive only one or two applications of rates that were safe on the other grasses.

In late summer, tests were initiated to determine among other things the best sequence for combined treatments of bensulide and Endothal. Plots receiving bensulide first followed by three repeats of Endothal showed better control than plots treated first with Endothal and then bensulide. There was some indication of an interaction between bensulide and Endothal that varied with time between applications.

In late summer one test was run at a local golf course on a green in play. Results were encouraging since selectivity proved to be excellent. Endothal applications at that time caused slight lightening in bentgrass color but full color returned within a week. Good *Poa annua* control was observed in this test.

What does all this mean? First, there is little question that use of Endothal can result in selective removal of *Poa annua* from both bentgrass and bluegrass turf. Next, valuable information was gained in 1975 concerning effective rates and proper timing of applications. The value of an integrated program using both pre- and post-emergence herbicides in tandem was demonstrated. Finally, many questions were uncovered concerning the best interval between applications, the effects of Endothal on young turf, and the selectivity on other grasses such as perennial ryegrass. The list goes on and on.

What's in store for 1976? Further refinement in rates and timing will be studied. New experiments will be run to answer some of the questions raised in 1975. A complete re-examination of pre-emergence herbicides on sand based putting turf is planned. Further work on pre and post-emergence combinations will be conducted. A number of new ideas oriented toward sod production will be tested. In addition, several new and old potential post-emergence herbicides will be examined.

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It is premature at this time to discuss specific rates or programs for applying Endothal, but if all goes well in 1976, we may be able to offer a tentative program for use on various types of lawn and golf turf. We would prefer to delay this until more detailed information can be gained, however.

So that's what's new in *Poa annua* control. I feel strongly that we've made solid gains in the first year of this expanded program. Since this program is not funded by the legislature, our survival is solely dependent on the people in the field who receive the benefits of our work. If you feel strongly about the role of research in turf management, please urge your club or organization to contribute to our research fund. This program can survive only as long as you support it.

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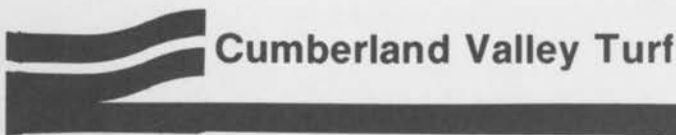
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