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I am going to begin hand watering sooner.

As Bob Vavrek of the USGA has espoused in the past, some of us get in trouble because of water mismanagement. In the Chicago area, sustained 90°+ is unusual; but in Kansas City, for example, it isn't uncommon and, in fact, it's the norm. How do they do it? Three words: syringe, syringe, syringe. Here at Naperville C.C., we didn't take the severe summer heat seriously until heavy wilting set in. I normally get away with this because nighttime temps can be counted on to dip into the low 60s, providing relief. Believe me, this year I will have a syringe crew trained and ready to go as soon as the mercury begins to rise.

I am going to increase my deep aerification program.

Joel Purpur at River Forest is

going to deep drill his greens twice this year instead of just once as in the past. He's not alone as the deep aerification contractors are already reporting increased interest.

I told you so #1.

After many unsuccessful attempts to get his three to four thousand square foot push-up greens rebuilt, Kevin Deroo at Bartlett Hills will finally get his wish as the village gave the go-ahead to rebuild the worst ones. Nick Hongestino at Schaumburg C.C. is adding five new tees to an already revamped layout. "The amount of play warranted this as there simply wasn't enough time for our tees to recover from the wear."

I need more stuff.

It looks like green covers are back in vogue. At River Forest, Joel noticed the greens which suffered from winter damage were the first ones to give him problems when the heat began. As a result, he is going to purchase five more green covers for next year. Several Chicago area clubs covered all greens and will continue this program next winter. Selling an irrigation system was made easier as several clubs are finally upgrading their systems. Superintendents that have perimeter systems for green banks had one less worry as a major area of concern for most was juggling the water requirements for greens and adjacent areas.

I told you so #2.

Many clubs which experienced problems maintain their predominantly *Poa annua* greens at one-eighth of an inch or lower. They don't cut low because they are masochists; superintendents respond to golfer pressure and club reputation. How many times (continued on page 32)

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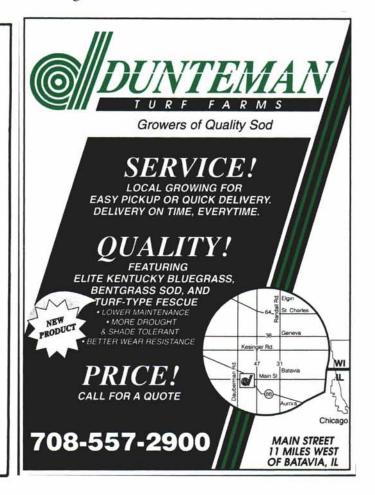
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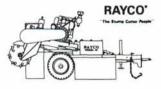
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Pythium Root Diseases and Summer Decline Phenomena

(continued from page 16)

nondescript; there are no yellow patches or streaks following drainage paths. Instead, there is a general thinning and decline in the health of a green, especially as environmental and management stresses increase during the first full season of grow-in (green open for play).

Third, the *Pythium* species involved (*P. arrhenomenes* and *P. aristosporum*) are different from most other *Pythium* root rots, and these species are not found to be strong pathogens in controlled studies. The youngest parts of the root (tips and root hairs) are infected by these species, which apparently interferes with nutrient uptake and plant vigor. The weakness and shallow depth of the root system predisposes the plants to severe stress.

Diagnosis of this disease is extremely difficult since no distinct symptoms occur and other stress factors have to be considered. It is often difficult to tell whether the presence of other minor root parasites or severe environmental stresses are the key to this type of disease. It is also interesting to note that no fungicide program has been found to control *Pythium* root dysfunction.

Summer bentgrass decline and Poa decline

In the semi-tropical southeastern U.S., growing bentgrass greens through the heat of the summer is a difficult proposition. Prolonged heat and humidity are frequently combined with many other stress factors, including root rot fungi, which results in shallow and weak root systems and plants on the brink of extinction. A disease syndrome has been described by L.T. Lucas (North Carolina State, Raleigh) called "summer bentgrass decline." Generally, the term "syndrome" is assigned to a problem when the actual cause has not been determined or is thought to be the result of several factors interacting.

Recent research at North Carolina State has focused on root and foliar parasitic fungi, primari-Pythium and Rhizoctonia species. Stress factors that also have been implicated include high soluble salts from fertilizers (e.g., K₂SO₄), algae and black layer, rootzone mix problems, and restricted wind movement that causes high surface tempertures (dead air greens). Plant symptoms of summer bentgrass decline are similar to those described for Pythium dysfunction, root although the problem is not limited to immature greens.

Unlike *Pythium* root dysfunction, summer decline has been controlled or prevented with fungicides. Most notable is the combination of Aliette (4 oz) plus Fore (8 oz) applied biweekly as a tank mix. Aliette is a systemic fungicide that controls a broad range of *Pythium* species, while Fore is a fairly broad spectrum contact that inhibits *Rhizoctonia*.

On the surface, it would appear that both Pythium and

Rhizoctonia are important to the development of summer bentgrass decline in the Southeast. However, there remains a question as to the role of Pythium root infection in this disease complex. First, the Pythum species frequently isolated from affected turf are weak pathogens or nonpathogens of bentgrass roots in greenhouse studies. Second, recent research in the Carolinas has shown that substitution of phosphoric acid for Aliette in a tank mix with Fore provides good control of summer bentgrass decline. Aliette (phosetyl aluminum) contains approximately 26 percent elemental phosphorus, or roughly the equivalent of a 0-52-0 fertilizer. Fore (mancozeb) contains the micronutrients manganese and zinc. Further studies are underway at North Carolina State to try to sort out the fertilizer versus the fungicide effects of the Aliette/ Fore control strategy.

In the upper Midwest, mature bentgrass does not undergo a summer decline (even in 1995). However, *Poa annua* surely does! Is there any connection between *Pythium* root rots, *Rhizoctonia* infections, and Poa decline? Probably not. After ten plus years of looking for root pathogens associated with *Poa annua* summer death, we have (continued on page 28)

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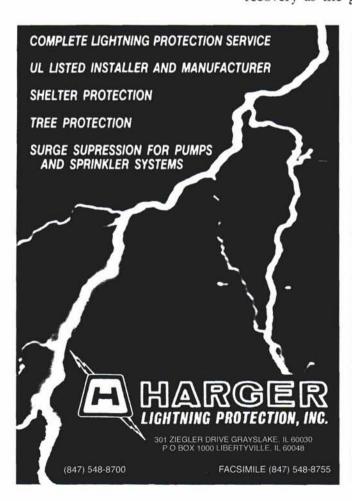
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program is my university expert. While at MSU, Bruce and colleagues conducted a number of studies concerning control and suppression of Poa annua with herbicides and growth retardants, including those mentioned above. Results with these products are mixed at best, with a general effectiveness rating of Embark > Aquagro > TGR/Cutless. Bruce also added that they have found Poa seedhead suppression following fall applications of Prograss (ethofumesate); plants that survived the Prograss treatment had much less seedhead production than check plots. Of course, Prograss is intended to kill the Poa, so you would want to use this approach on areas that were high percent bentgrass and cut at fairway height. Prograss is not labeled for use on green height turf.

Embark is probably the best Poa seedhead inhibitor we have, but it is also the trickiest to use. The window for best control is pretty narrow, and application rates are light, which means the application must be done with great accuracy. Dan Quast, CGCS at Medinah CC, has used Embark the past few years on five greens that are mostly bent but have small, blotchy spots of Poa annua. When the small spots seed, greens become bumpy and roll unevenly. Dan applies Embark at 0.1 oz /1000 (4.3 oz per acre) with a spray hawk in mid April. The timing is based on early seed production of marker plants (and may be a little later this year!). There is a noticeable stunting of the entire green about two weeks after application, and this effect lasts another couple of weeks. About four weeks after the application, Dan applies a fertilizer to stimulate recovery as the growth retardant effect of the Embark wears off. Dan feels he gets up to 90 percent seed reduction if all goes well, and he has seen little injury from these light Embark treatments.

John Gurke, CGCS at Aurora C.C. has received a lot of notoriety recently for his successful use of Aqua-Gro for Poa seedhead suppression on his greens. Once I talked to John, however, I found that he actually got (stole) the idea from Dan Anderson, CGCS at Fox Valley C.C.! So I talked to both experts. Dan has used Aqua-Gro the past three seasons with very good results. He applies 4 oz / 1000 for the first application and follows that at 10to 14-day intervals at approximately 3 oz /1000. The product is applied in 5 gal / 1000 water and is left on the leaf surface to dry (it is not watered in). John follows a similar program but has

(continued on page 30)



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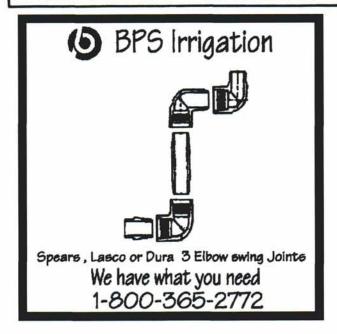
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the Bull Sheet

(continued from page 18)

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Pythium Root Diseases and Summer Decline Phenomena

(continued from page 24)

not found consistent activity of Pythium or Rhizoctonia. More often, we find ectotrophic patch disease fungi such Magnaporthe, Gaeumannomyces, and Phialophora spp. which could be a major predisposing factor for Poa annua summer decline. Also, several fungicide trials involving Poa annua summer survival have been conducted, and Aliette/Fore and other Pythium related treatments did not save the Poa. Experiences of several superintendents in the Midwest during 1995 support these research findings.

Interestingly enough, there are a couple of fungicides which appear to stop Poa decline, even in 1995. Heritage (azoxystrobin, ICIA5504) is a derivative of a naturally-occuring fungicide that is very active against patch diseases, Rhizoctonia and other basidiomycetes, plus Pythium blight. Lynx (tebuconazole, HWG 1608) is an experimental DMI that has good activity on root diseases and appears to reduce Poa decline in tests. It looks field Aliette/Fore is not the answer for Poa decline, but there may yet be an answer; STAY TUNED... ■



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Synopsis of the CDGA Green Seminar (continued from page 12)

lines to keep you out of trouble. 3. On March 20, 1996, new rules and procedures were put into law concerning the "green card." All new hires that are not U.S. citizens must have the new "pink card." This card was developed to cut down on the forgeries of the "green card." The new card must have the following on it: photo (must show the right ear), a fingerprint and must be signed by the person. The "green card" is grandfathered if the person had it before March 20, 1996; but it is highly recommended that all of your non-citizen employees get the new "pink card." Cards can be procured at 10 West Jackson Street, Chicago. It is advised that the persons arrive early (6 a.m.) for the line could be blocks long. They will need \$90 cash or money order for the card and application.

Dr. Bruce Branham, Associate Professor of Turf Management, University Illinois, spoke on "Nitrogen Fate Studies." The studies proved that very little nitrate is leaching from our soils. All of the hysterics accusing our industry of putting too much fertilizer on the ground and polluting the ground water, etc., are just not true. Yes, the fertilizer that falls on the driveways and walks can be directly washed into the sewers and end up in our streams; but the fertilizer applied to turf stays there and is used by the plant or volatilizes into the air.

The study on rates of nitrogen to new sand greens was very interesting regarding the rates needed to establish the grow-in. Rates of .5, .75 and 1 pound were applied weekly to a green and charted. The green utilized all of the nitrogen that was applied, but in the end, the .5 pound rate was very adequate to provide the proper grow-in. This test also showed that a starter fertilizer was very important and should not be missed to save a few dollars.

Bruce Williams, CGCS, president of the GCSAA, spoke on "Value of Belonging and Participating in Professional Associations." Bruce gave a very good slide show talk on this subject. Very professional. A point he brought out was, "Associations provide the majority of adult education in America."

Dr. Randy Kane, CDGA turfgrass advisor, topic was "Poe annua Is, Too, a Hound Dog." Randy went on to describe some of the diseases that caused all of

the problems in summer 1995 and then touched on the winter of '95/'96 and the problems that could come about from it. From this introduction, the following gave a thumbnail outlook of what, when, and how of this past winter and maybe what to expect.

Paul Vermeulen, USGA, said "Don't panic" (easy for him to say). He stated that if you have a severely damaged green, keep the golfers off of it. Put a temporary green out in front to get the regular green back as fast as possible.

Dr. Hank Wilkinson, University of Illinois, stresses that you need to access as early as possible what you have or don't have as far as putting green turf. Your decision on what to do may depend on the budget that you have to repair any damage. But act early. If you think you may need to reseed, do so as soon as you can to gain as many days as possible for a quicker recovery.

Dr. Tom Fermanian, University of Illinois, reminded us that if we have to overseed in bluegrass and yet still need a preemergence herbicide that Tupersan is the only safe product to use.

Ask the Expert (continued from page 26)

a higher initial application rate (a gutsy move). The timing of the first application is critical and is based on finding seed initials or early seedhead production in protected areas of the course. There is a definite discoloration of the turf "singe", but it is not very noticeable in many years because the other turf areas have not yet come fully out of winter dormancy. Besides, John says it mows off fairly quickly anyway.

The GA inhibitor growth retardants such as TGR and

Cutless have not found much favor in suppressing seedheads, probably for several reasons. First, the timing of application for best results is early in the spring, and there are potential negative side effects of applying PGRs to plants that are just coming out of dormancy. Also, these products do not stop formation of seeds; they only slow elongation of the seed stalk. Once the retardant effect wears off, seed stalks will resume growth and you still see the seedheads. In some cases, it appears that heavier seedhead production occurs once the PGR effect wears off.

As with any chemical program, do your homework and make sure you know what the risks of these approaches are to your turf. Have your rates and timing down, and make sure your application equipment is calibrated and in tip-top working condition. Also, don't forget that "the use of brand names and any mention or listing of commercial products or services does not imply endorsement by the CDGA, University of Illinois, or the MAGCS, nor discrimination against similar products or services not mentioned."