Special Thanks

Golf Course Superintendents Association of Northern California wishes to thank the following people for making our Christmas Party and Larry Lloyd Memorial Tournament a success.

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PART ONE

SPECIAL EDITION:

SUMMER PATCH DISEASE IN CALIFORNIA

This is a follow-up regarding **THE VERY DESTRUCTIVE DISEASE** *infecting the vascular crown and root of* **Poa annua** *on golf course greens as evidenced by the numerous samples of grass plants submitted to Dr. Robert Endo, UC Riverside. The diligent research efforts of the University pathologists sparked by your many samples culminated to date in the findings reported in their release that follows:*

The summer patch pathogen *Magnaporthe poae*, is the cause of the vascular crown and root rot disease in California.

R.M. Endo, and H.D. Ohr, Professor and Extension Plant Pathologist respectively, Department of Plant Pathology UCR and A.H. McCain, Extension Pathologist, Department of Plant Pathology, UCB.

During last summer and fall, a ver destructive and common patch disease affected *Poae annua* greens in southern and central California; bentgrass plants were apparently not susceptible. The disease was not severe during hot weather.

Microscopic examination of diseased plants from the patches revealed that the primar[illegible] secondary roots are affected with a brown to black dry root rot which sometimes involved the crown as well; frequently a discoloration of the central vascular cylinder was also

present. Since we were unable to identify the casual fungus that we isolated, we tentatively [illegible]d the disease "vascular crown and root rot."

The severity of "vascular crown and root rot" depends upon whether the outer portion of the root (fig. 1, epidermal and cortical cell) and / or the inner portion of the roots is infected (fig.2, xylem or vascular tissues). Outer root infection causes little damage but inner root infections of the vascular tissues are very damaging because the xylem is responsible for transporting water and nutrients up the roots.

Since Smiley has demonstrated that cortical infections tend to become vascular at soil temperatures above 82 F., this explains the severity of the disease at high temperatures.

The cause of the disease in California has been unknown since the isolate, pathogenic fungus failed to form spores in the laboratory and could not be identified. We finally identified the fungus as *Magnaporthe poae* in February 1989, following mating of our unidentified isolates with either of two known [illegible]ng types of *M. poae* obtained from Dr, Peter Landschoot of Rutgers University. Following mating with one of two compatibility types of *M. poae*, the fungus produced the typical sexual stage of the fungus by which identifications could finally be made. Of nine pathogenic isolates that we had isolated from *P. annua* plants obtained from nine golf courses in southern California, eight turned out to be isolates of *M. poae*, the established cause of the summer patch disease of *P. annua* in the eastern and midwestern U.S. One of the 9 isolates was no t the fungus, *M. poae*, but a yet to be determined fungal pathogen, probably *Gaeumannomyces incrustsans* cause of second patch disease of *P. annua* or *Leptosphaeria koerrae* (cause of the necrotic ringspot disease of *P. annua*. Thus, there appear to be several patch diseases of *P. annua* in California that are caused by different root-attacking fungi but *M. poae* appears to be the most common and damaging.

In the last 6 years, plant pathologists in the U.S. have described many new patch diseases of turfgrass that are caused by at least five [illegible]rent species of fungi that are able to grow ion and attack the surfaces of turfgrass roots as hyphae or fungal threads. Such fungi are called ectotrophic fungi. The situation on turfgrasses in California in regard to all these new patch diseases caused by ectotrophic root fungi is incompletely known, mainly because complete descriptions of the causal fungi have not yet been published. For a more detailed discussion of these new, destructive, difficult-to-control patch diseases that are caused by ectotrophic root fungi, see the article by Endo, Ohr & McCain, entitled "Patch diseases of turfgrasses caused by ectotrophic fungi are difficult to control" in the spring 1989 issue of "California Turfgrass Culture."

Very little has been published about the summer patch disease and its casual fungus *Magnaporthe poae*. What we learned about summer patch according to the above plant pathologists, to write this article was information information obtained directly from two researchers currently in summer patch research: Dr. Peter Landschooot, Department of Biology, Rutgers University, New Brunswick, N.J. and Dr. Henry Wilkinson, Department of Plant Pathology, University of Illinois, Urbana,Il.

The only method of controlling summer patch is by preventing infections of the roots by applications of systemic chemicals to the soil in early spring at the time the fungus is growing over the roots. The systemic chemicals should be sprayed onto the plants in 4 gallons of water / 1000 sq. ft. and watered immediately into the root zone with a "short", sprinkler irrigation. Do not allow the fungicide to dry on the leaves before watering-in. The systemic fungicides must be watered-in because the fungicide does not move down the pant from the foliage to the roots; it moves only upward in the xylem.

Proper watering-in is both difficult and critical because of the following reasons: 1) if the fungicide is a wettable powder, it will tend to get filtered-out and therefore diluted by any litter and thatch that is present; 2) yet the water containing the fungicide must be made to penetrate the soil or sand as uniformly and as deeply as possible (1.5 inches) in order to obtain uniform, deep coverage of the roots; and 3) uniform deep coverage of the roots requires just enough water to do the job but not to dilute the fungicide to the point of ineffectiveness. Unfortunately, no watering-in guidelines can be recommended because each area of turf has a different amount of thatch, layering, different soils, different numbers of plants, different amounts of compaction, water repellency, etc. A dry-run irrigation with water might be attempted in advance to obtain an approximation of the watering-in time that is required. To get around the problem of soil-repellancy, add a detergent.

The next problem is proper timing: when to apply the fungicide. For *M. poae*, apply the systemic fungicide from mid-March through mid-May. The trouble is that fungicides only reduce the soil populations of *M. poae* temporarily, and that the hyphal growth of *M. Poae* over the roots occurs over a rather wide range of soil temperatures that includes several months of the growing season. This means multiple applications of systemic fungicides which are very expensive. Fortunately, eastern turf pathologists have frequently found (Personal Communication) that a single timely application of a systemic fungicide against the summer patch pathogen is sometimes as effective as several applications applied 4 weeks apart. The unexpected success of a single treatment is surprising, and may be due to the fact that reduction of infections early in the season may result in very significant levels of season-long control.

However, since several applications of a systemic fungicide 4 weeks apart are likely to be more effective, on the average, than a single application, this choice should be left to the individual applicator concerned. If several applications are made rather than one, apply anytime successive applications 4 weeks apart beginning in mid-March. If a single application is made, apply from mid-April to mid-May. The systemic fungicides effective against *M. poae* are banner, 1.1 EC, at 4 fl.oz; Bayleton 25 DF at 4 oz; Tersan 1991, 50 W, at 7 0z; and Fungo, 50 W, at 8 oz. Banner is not yet registered for use in California and Rubigan is herbicidal against *P. annua.*

This article from"Rub of the Green" April,1989

Part 2 will be in February issue of Thru the Green