RECAP OF NOVEMBER SPEAKER

Broadleaf P4 is a very effective water absorbing polymer that can be utilized to store water within soils and/or potting medias, under a variety of conditions for growing plants. P4 can be a very cost effective method of providing for an increase in water storage, if you are having problems supplying the needs of the growing plants, or if you have expensive water, if it is in short supply and if your media cannot hold sufficient water for plant use.

TO WHOM IT MAY CONCERN:

Golf Course Superintentent, _____ of the_____recently brought in, sent in plugs of turf grass to us for the determination of possible disease-causing organisms.

Examination of the affected Poa Annua revealed that they manifested typical symptoms of a vascular (=water-conducting tissues) crown and root rot. In other words, the main and lateral roots showed a discoloration which affected the central cylinder of the roots. This indicates that the water and nutrient-conducting tissues of the root (=xylem) are affected internally with what appears to be a fungal pathogen.

Unfortunately, this is an unknown disease and we are only now working on the possible cause. For the first time, we were able to reproduce the disease in the greenhouse at Riverside by inoculating healthy Poa Annua plants with a pure culture of a sterile fungus that we isolated from diseased plants. The fungus is sterile since it does not produce spores. This suggests that the fungus grows as threads (= hyphae, mycelia) on the surface of the roots and spreads slowly in the soil by means of the threads by root-to-root contact. Apparently the fungus infects the epidermal cells and the cortex of the root (outside layers of the root) and moves quickly into the xylem or water and nutrient-conducting tissues of the root. The fungus multiplies in the xylem and either plugs-up the water- conducting tissues with hyphae or produces a toxin which poisons the roots and stunting, yellowing, death of the lower leaves and eventually death of the affected plants especially under conditions of stress such as high temperatures and lack of water (plugged xylem).

Since the fungus does not produce spores, the spread from green to green probably occurs by means

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of the threads present on the roots and crown of the dead plants that adheres to cultivation equipment and machinery. Aerification machinery is probably the most efficient way of spreading the fungus to healthy greens.

Control of the disease in established plants by systemic fungicides is extremely difficult, if not impossible, because:

1)the litter and thatch tend to filter out the fungicide particles, 2)watering-in of the fungicides into the into the root zone is tricky because too much water may dilute the fungicide and too little watering-in of the foliage-applied fungicide will fail to get the fungicide into the effective root zone; 3)assuming that the systemic fungicde was taken-up by the roots, it must be taken-up in effective concentrations, by the plugged-up roots and 4)no systemic fungicide is truly curative; at best it will inhibit or suppress the fungal pathogen in the xylem so that when the concentration of fungicide drops once again in the xylem, the fungus will start to grow and to muiltiply anew. In another words, to expect that systemic fungicides (Bayleton, Benlate, 3336, and Banner [unregistered in California]) will cure the disease is asking the near impossible.

Since the xylem is diseased and plugged-up, the Poa annua plants grow poorly in summer, and the diseased plants come under great stress during hot weather. Therefore, apply low amounts of phosphorus fertilizers to promote root growth and water whenever diseased plants show signs of moisture stress. Whether or not the infected plants will die depends upon how severly the roots are infected and just where infection is located on the main root. If the crown is infected, plants will die whereas if the main root is infected a reasonable distance below the crown, the infected plant may survive until such time that infection moves up into the crown.

To aggravate the situation, there may also be a second disease affecting the roots and crown of Poa annua caused by the fungus, Magnaporthe poae (summer patch disease). This fungus attacks mainly the cortex rather than the xylem of Poa annua roots, but at soil temperatures above 85 degress F., this fungus will also attack the water-conducting tissues (xylem). Therefore, it can also be very damaging at high soil temperatures. Unfortunately the two diseases often occur together on Poa annua and it is very difficult to determine which of the two diseases predominate in a particular diseased area.

Fortunately the same systemic

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fungicides are used against the summer patch disease as are used for the vascular crown and root rot disease. Applications are made in the same manner, that is, applied to the foliage and watered-into the soil. The systemic fungicides may do a slightly better job against the summer patch disease than against the vascular crown and root rot disease because in the former, the cortical cells rather than the all important xylem in the main site of attack.

Do not feel that you are to blame for having this disease on your greens. Nothing that you did or did not do brought on the disease. The Poa annua plants are very susceptible and once the fungus is introduced into the green, it is able to develop unimpeded.

We hope that further research will witness the development of more control measures.

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