

Developing Field Inoculation and Quantitative Disease Assessment Methods to Correlate Disease Resistance with Controlled Environmental Inoculations

Background

To be certain that in vitro techniques used to quantify turfgrass disease resistance, are reliable, the level of correlation between in vitro techniques and field disease expression needs to be determined. Typically, disease incidence is quantified using ratings of parameters such as visual quality, dry weight reduction, shoot density reduction, lesion severity and size and more recently, digital image analysis. Two major turfgrass pathogens, currently being utilized to correlate field resistance with in vitro results, are *Rhizoctinia solani* Kühn AG2-2-LP and *Magnaporthe oryzae* Couch (anamorph=*pyricularia oryzae*). *R. solani* AG2-2-LP is the pathogen causing the large patch disease which occurs during spring and fall in zoysiagrass, St. Augustinegrass and bermudagrass with characteristic symptoms of sheath rot. *M. oryzae* is the pathogen which causes the disease gray leaf spot, occurring under warm humid conditions, early/late summer on St. Augustinegrass. Diagnostic features of gray leaf spot include necrotic leaf lesions which coalesce during heavy disease pressure. In vitro techniques have identified turfgrass germplasm exhibiting resistance to both pathogens.

Objective and Approach

- Establish field plantings with germplasm susceptible/resistant to pathogens and quantify disease symptoms using various parameters i.e., disease severity, lesion size, dry weight reduction, visual quality and use of digital image analysis.
- Correlate the disease parameter ratings of field inoculations with results of in vitro assay trials to determine the optimal evaluation method.

Program Benefits

- The correlation of field inoculation techniques with controlled environment inoculations will give a high level of certainty in the accuracy of the in vitro screening program.
- Results of these efforts will enable large progeny and mapping populations to be screened in a reliable and cost efficient method.

Researchers

Sue Metz
Jonathan La Mantia
Ambika Chandra