

REDUCING ECONOMIC LOSS CAUSED BY STEM AND CROWN RUST IN PERENNIAL RYEGRASS

Eric Watkins, Brian Steffenson, Nancy Jo Ehlike, Brian Horgan, Don Wyse and Derek Crompton
Department of Agronomy and Plant Genetics and Department of Horticultural Sciences
University of Minnesota

The turfgrass breeding program at the University of Minnesota is conducting research on disease resistance in several turfgrass species. Currently, we are focusing our efforts on stem and crown rust disease of perennial ryegrass. Although significant resources have been devoted by various governmental agencies in order to better understand and combat rusts in small grains, little attention has been given to these economically important diseases in perennial ryegrass and other turfgrass species. There is a need to better understand stem and crown rust disease in perennial ryegrass so that improved management practices can be recommended and disease resistant varieties can be developed for the grass seed producers of northern Minnesota and turfgrass managers throughout the region.

Three major objectives were identified for this project. In the past year we have made significant progress towards each objective.

1. Establish best management practices for rust disease management in perennial ryegrass seed production.

In 2008, perennial ryegrass seed production trials evaluated the impacts of fertility, plant growth regulation, and fungicide application on rust severity. The results of these trials will be known in fall 2008. Preliminary results are promising and indicate that improved management practices will help reduce rust severity in perennial ryegrass seed production fields.

2: Determine the genetic diversity of stem and crown rust pathogens that affect perennial ryegrass seed production fields and turfgrass stands in order to develop appropriate screening methods for a breeding program.

The first step in this component of the project is to collect stem and crown rust urediniospores from across Minnesota to use for disease screening. In both 2007 and 2008, rust collections were made from both turf stands and seed production fields. We have also been able to obtain a mist chamber for rust inoculations that will be used for graduate student research projects and to screen breeding material during the winter of 2008-2009.

3: Develop new cultivars of perennial ryegrass with higher levels of resistance to rust for seed production in northern Minnesota.

In the past year, we have released 'Arctic Green' perennial ryegrass, which has shown improved rust resistance compared to previous breeding lines in our program. Additionally, we anticipate another elite cultivar being released next year: 'MSP' perennial ryegrass has shown excellent turf quality and high levels of crown rust resistance in both turf and seed production situations.