Breeding Sustainable Turfgrasses

By Dr. Eric Watkins

The University of Minnesota turfgrass breeding program conducts research is contributing to the development of low-input turfgrasses for cold climates. For several years, we have worked on the development of winter hardy perennial ryegrasses that benefit both turfgrass seed producers and turfgrass managers in Minnesota and other cold climates; we have seen some improvements in recent cycles of selection and look forward to releasing new cultivars of this species onto the market. We also have also initiated research on the native grass *Koeleria macrantha* (prairie junegrass) as a turfgrass for low-input, sustainable landscapes. More recently, we have shifted our focus to improving the fine fescues.

The fine fescue species - strong creeping red fescue (*Festuca rubra* ssp. *rubra*), slender creeping red fescue (*F. rubra* ssp. *litoralis*), Chewings fescue (*F. rubra* ssp. *commutata*), hard fescue (*F. brevipila*) and sheep fescue (*F. ovina*) - provide many low-input traits that we know, through online and in-person surveys, are important to turfgrass professionals and homeowners. These grasses generally do well in sun or shade, grow slowly to reduce mowing requirements, and have very good drought tolerance. In addition, fine fescues can be infected with the fungal endophyte *Epichloe festucae*, which leads to enhanced insect tolerance and disease resistance. Some fine fescues seem also to have the ability to suppress the growth of certain important weeds species.

The University of Minnesota turfgrass breeding program leads a multi-state collaborative project funded by the USDA Specialty Crop Research Initiative involving researchers from Rutgers, Wisconsin-Madison, Purdue, Oregon St., and USDA-ARS (http://lowinputturf.umn.edu/). The team of researchers spans a range of expertise from breeding and genetics, to turf management, to social science and marketing. This overall project will increase the use of well-adapted fine fescue cultivars in sustainable landscapes throughout the northern United States, Canada, and similar temperate regions. In our first objective, we will survey consumers, land managers, and seed producers about the barriers they face in conversion to and utilization of fine fescue grasses. In the second objective we will lead a sustained effort of research focused on improving fine fescue traits identified as important by stakeholders (resistance to summer patch disease, heat stress tolerance, wear/traffic tolerance) utilizing new technologies and

proven approaches. The third objective will generate new knowledge about complex interactions between genetics and turfgrass management. Our approach in the fourth objective will lead to new ways to use publically available data, such as turf trial results from university trials, to improve turfgrass purchasing decisions. Our fifth objective will find solutions to several barriers that are preventing stakeholders from using fine fescues on landscapes; for instance, it might be that consumers are wary of the potential complexity of the lawn conversion process. Finally, our sixth objective will deliver research-based information to consumers, seed producers, and land managers using new and innovative outreach methods.