

Germplasm Improvement of Low-Input Fine Fescues



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Objectives:

The long-term goal of this project is the development of improved, low-input fine fescue cultivars that provide economic and environmental benefits for the public.

This project provides matching funds for a five-year USDA-NIFA project funded by the Specialty Crops Research Initiative (grant number 2012-51181-19932). The project involves 10 scientists, along with graduate students and support staff, from three Universities (University of Minnesota, Rutgers University, and the University of Wisconsin).

Overview

Lawns and grass areas define urban landscapes in the United States. The challenge is breeding cultivars that respond to market demands for viable specialty products, consumer demand for low-input products, and government leaders' demand for effective and efficient vegetation that supports their mandate to protect the public good as well as new initiatives to create sustainable cities. This project defines the critical gaps in a system that would support the use of low-input fescue cultivars in sustainable landscapes such as lawns, parks and golf courses. In Objective 1, we will evaluate the motivations and barriers public land managers would have for converting to low-input fescue cultivars. In addition, we will explore the role public officials could play in supporting resident conversion to low-input fescue through policy and programs. In Objective 2, we will evaluate homeowners' assessment of diverse grass traits, their grass seed purchasing behaviors, and

Figure 1. Fine fescue cultivar evaluation maintained at golf course fairway mowing height (photo credit: Andrew



message delivery technologies. Informed by findings from these studies, in Objective 3, we will develop new fescue cultivars that blend desired existing traits with enhanced potential to withstand wear, heat, and important turfgrass diseases such as snow mold. This objective will also include projects that evaluate tolerances of fine fescue species and cultivars to these stresses as this information is lacking in the literature. Finally, in Objective 4, we will use insights from the previous objectives to design effective outreach and message delivery technologies for consumers of low-



Figure 2. Fine fescue breeding nursery in St. Paul, Minnesota.



input cultivars. The ultimate outcome of this project will be enhancement of more sustainable turf for multiple management situations including lawns, parks, and golf courses (Fig. 1).

Progress

We have initiated a collaborative breeding program (Fig. 2) that involves both the University of Minnesota and Rutgers University. A mowed spaced-plant progeny evaluation of hard fescue breeding lines was established in both New Jersey and Minnesota. Plants in the New Jersey trial were evaluated during summer 2013 for resistance to summer patch, an important disease of this grass species. Selected plants will be integrated into breeding programs as part of this project. Three fine fescue turf trials were established

(two sites in Wisconsin, one site in Illinois). These trials will be evaluated for snow mold incidence in spring 2014; data from this trial will be used to drive future breeding decisions and research projects. Multiple trials focused on wear and traffic tolerances were established in New Jersey; data from these trials will be collected through 2014. Initial heat tolerance screening of fine fescue cultivars was also initiated.

Social science and marketing research projects will begin in late 2013 and early 2014. One interesting facet of the marketing study will include bringing consumers to turf trials in both Minnesota and New Jersey where they will view turf evaluations and make choices between pairs of turfgrass plots that differ in certain characteristics (weeds, color, leaf texture, etc.) (Fig. 3). This type of

evaluation will allow us to determine which traits are of greatest importance to consumers.

Summary Points

- We have developed a collaborative breeding program focused on the development of low-input fine fescues for the northern United States.
- Researchers are evaluating fine fescues for heat tolerance, traffic tolerance, and resistance to snow mold disease. These traits are all important improvement targets if these grasses are to be used more extensively on golf courses in the northern United States.
- Social science and marketing research will provide information about consumer preferences for low-input turf.