Adaptation and Management of Fine Fescues for Golf Course Fairways

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Objectives:

1. *Determine if the plant growth regulator trinexapac–ethyl improves performance and divot recovery of fine fescue species and mixtures on low–input golf course fairways.*
2. *Determine if fine fescues can survive when managed as fairways under acute drought*
3. *Determine if fine fescue fairways require fungicides at currently–recommended application rates to survive winter snow mold pressure.*

Golf course fairways in the North Central region primarily consist of species that require high inputs of water, pesticides, and nitrogen fertilizer. Golf course superintendents continue to be affected by governmental regulations restricting the use of chemical and water inputs on managed turfgrass. We believe that future restrictions will impact golf course management in a very significant way and that the solution to the problem of inputs on golf course fairways will not be changes in management practices, but instead the use of lower–input grasses. Low–input fine fescue species should be able to withstand the pressure from typical turfgrass stresses while producing acceptable turf and excellent playing quality—all with fewer overall inputs of pesticides, water, and fertilizer. Due to limited research on these species in fairway settings, superintendents are wary to begin using fine fescues. This research project is investigating a few key areas where research–based information is lacking.

Objective 1: Twenty–five mixtures of single cultivars representing five fine fescue species (´Radar´ Chewings, ´Beacon´ hard, ´Navigator II´ strong creeping red, ´Shoreline´ slender creeping red, and ´Quatro´ sheep) were established in summer 2012 and arranged as a split–split plot design with three replications. Plant growth regulator treatments and traffic treatments were initiated in early June 2013 (Fig. 1). The plant growth regulator (PGR) trinexapac–ethyl was applied every 200 growing–degree days at the label recommended rate. Plots received traffic treatments 3 days/week using a golf cart traffic

Figure 1. Fine fescue fairway plots with non–trafficked turf on left and trafficked turf on right. (photo credit: Maggie Reiter)

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Figure 2. A divot-cutting device was used to remove divots from both trafficked and non-trafficked plots. (photo credit: Maggie Reiter)

Figure 3. Fine fescue plots on a fairway at Northland Country Club in Duluth, MN. (photo credit: Maggie Reiter)

simulator. On August 1, divots were created in each plot with a custom-made divot harvester (Fig. 2). Divots were filled with topdressing sand to the soil level. Traffic treatments and plant growth regulator treatments concluded on August 31 and September 15, respectively. Data collected included monthly turf quality ratings and weekly grid counts on divots to quantify divot recovery. Additionally, grid counts were taken on each plot every 10 days after traffic treatments concluded to quantify traffic recovery. Most plots without traffic showed acceptable levels of turfgrass quality. Under regular traffic treatments, the plots seeded to mixtures containing significant amounts of hard fescue and creeping red fescues appeared to have the best turfgrass quality. Sheep fescue was not a major constituent of successful mixtures. In fall 2013, a replication of this trial was established so that all treatments can be repeated in 2014.

Objective 2: The same species and mixtures as in Objective 1 will be evaluated under acute drought for a 60-day period. The drought trial was seeded in September 2013 as a randomized complete block design with six replications. Water will be withheld from the trial for approximately 60 days in summer 2014. Data collection will include drought stress, recovery from drought, disease incidence, color, and turfgrass quality.

Objective 3: The same fine fescue species and mixtures as in Objective 1 will be evaluated for resistance to snow mold on golf course fairways in Minnesota. Plots were seeded in fall 2012 at Northland Country Club (Duluth, MN) (Fig. 3); The Cragun's Legacy Courses (Brainerd, MN); and Theodore Wirth Golf Club (Minneapolis, MN). Each trial was arranged in a split-plot design with three replications with the main plot being fungicide treatment (fungicide or no fungicide) and the split plot being fine fescue mixture. In October 2012, all plots were treated with a fungicide to reduce snow mold disease risk prior to full establishment. Fungicide treatments were applied in October 2013. In spring 2014, ratings will be taken on snow mold disease severity at all three locations.

Summary Points

- Fine fescues have shown potential as a golf course fairway grass in Minnesota.
- This study is evaluating mixtures of fine fescues for fairway performance.
- Hard fescue and creeping red fescues were present in plots that performed best under traffic stress.
- Results from this project should assist in developing optimized mixtures for use on golf courses in the northern United States, ultimately leading to overall reduced inputs of water, fertilizer, and pesticides.

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