

Determining optimal nitrogen fertility rates for reduced input fine fescue based putting greens

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The use of nitrogen fertilizers on golf courses is scrutinized in the United States. For creeping bentgrass (*Agrostis stolonifera* L.) putting greens in the Midwest U.S., annual nitrogen rates range between 1-6 lb. N 1000 ft⁻². While these rates maintain performance and quality, they are not sustainable. However, using alternative turfgrass species for greens may help decrease nitrogen use. Fine fescue turfgrasses are a predominant choice for greens in many parts of Europe, and these grasses are known for lower nitrogen requirements and reduced input management. However, because the use of fine fescues for greens has received limited attention in the United States, there has been little research on the amounts of nitrogen required to maintain a reduced input fine fescue green. Therefore, the objective of this study was to determine the lowest possible annual nitrogen fertilizer rate for maintaining a reduced input fine fescue putting green. Chewings fescue (*Festuca rubra* ssp. *commutata*), strong creeping red fescue (*Festuca rubra* ssp. *rubra*), slender creeping red fescue (*Festuca rubra* ssp. *litoralis*), hard fescue (*Festuca rubra* ssp. *trachyphylla*), colonial bentgrass (*Agrostis capillaris* L.), and creeping bentgrass were established in St. Paul, MN. Plots were mowed at 0.200", and were treated with either 0, 1, 2, or 4 lb. N 1000 ft⁻² of nitrogen using 75% methylene urea in four split applications (every 40d) beginning May 25th, 2017 and May 24th 2018. Plots were managed using a reduced input strategy, and fungicides were not applied during the growing season. Turfgrass quality was assessed visually, using digital images, and using the normalized difference vegetation index. During the first year of this study, Chewings and slender creeping red fescue plots maintained the highest quality of the fine fescues, they maintained high quality at the low nitrogen rates tested compared to both creeping and colonial bentgrass, and these fine fescue species had little to no incidence of disease throughout the study. Therefore, when managing a reduced input putting green, both Chewings and slender creeping red fescue may be suitable alternatives to creeping bentgrass when low nitrogen rates are used.

