Sincik M, Açıkgöz E (2007) Effects of white clover ınclusion on turf characteristics, nitrogen fixation, and nitrogen transfer from white clover to grass species in turf mixtures. Commun. in Soil Sci. and Plant Analysis 38(13):1861-1877.

Abstract

An irrigated field trial was conducted to test the effects of white clover in three turfgrass species (perennial ryegrass, Kentucky bluegrass, and creeping bentgrass) on color, clipping yield, and botanical composition and to estimate nitrogen N_2 fixation and N transfer from white clover to associated turfgrass species under different N-fertilization conditions in 1999–2002. Nitrogen fertilizers significantly increased color ratings in all observations. Grass–white clover mixtures had better color ratings than pure grass at all sampling dates and seasonal averages in unfertilized conditions. Fertilized pure grass plotsyielded significantly more than control plots in all turfgrass species. Nitrogen fertilization did not affect clipping yield greatly in turfgrass–white clover mixtures. Nitrogen application significantly decreased white clover percentage in the harvested clippings in second and third year. Nitrogen fertilization increased tissue N concentration positively in all turfgrass species grown alone. In contrast, N fertilization did not greatly affect tissue N concentration of either turfgrass species or white clover in the mixtures. Nitrogen fixation of white clover was estimated as 24.6, 30.7, and 33.8 g m^{-2} $year^{-1}$ in perennial ryegrass, Kentucky bluegrass, and creeping bentgrass, respectively. The total estimated N_2 fixation gradually decreased with increasing N fertilization. Nitrogen transfer from white clover to the associated turfgrass varied from 4.2 to 13.7% of the total N that the white clover fixed annually.