

Morphotype identification and diversity analysis in the Mediterranean tall fescue

Jennifer Black¹, Perumal Azhaguvel^{1,2}, Mike Trammell¹, Konstantin Chekhovskiy¹, Malay C. Saha¹

¹ Samuel Roberts Noble Foundation, Inc., 2510 Sam Noble Parkway, Ardmore, Okla.

² Syngenta, 2369 - 330th Street, Slater, IA

The long, hot and dry summers that prevail in parts of Oklahoma and Texas are the major limitations for the persistence of tall fescue [*Festuca arundinacea* Schreb. syn. *Lolium arundinaceum* (Schreb.) Darbysh] in the region. Tall fescue has two distinct morphotypes, the Continental and the Mediterranean, which are commonly known as ‘summer-active’ and ‘summer-dormant,’ respectively. Nuclear and chloroplast genome specific primers were assayed to distinguish the two morphotypes. The Mediterranean fescue has distinct nuclear and chloroplast genomes compared to the Continental. A 47 bp deletion in the chloroplast locus, NFTCHL045, was consistently identified and verified in the Continental populations with different background. Several other chloroplast and nuclear loci with distinct fragments in the two morphotypes were also identified. A set of four chloroplast and four nuclear loci were selected to use as diagnostic markers for the morphotype designation of tall fescue germplasms. Genetic loci associated with summer dormancy traits can greatly expedite the cultivar development process. As a first step, diverse materials of the Mediterranean origin have been collected from 28 cultivars and/or populations. Each accession was represented by 5-15 genotypes. DNA was extracted from individual genotypes and tested for the presence of fungal endophyte and morphotype confirmation. Only the Mediterranean morphotypes without any endophyte were selected for a diversity study. The diversity panel has been assayed with 12 chloroplast and 44 nuclear genome specific primer pairs. Genotypes from distinct diversity groups will be selected to develop a nested association mapping population.