Evaluation of an Orchardgrass Collection from Greece

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The introduction of an improved perennial cool-season grass to the summer dry environments of the southern Great Plains has been a major goal of the Noble Foundations grass breeding program. High summer temperatures and associated moisture deficits have resulted in the unsuccessful adoption of many traditional cool-season perennial grasses in these areas. Orchardgrass (*Dactylis glomerata* L.) is one of the more highly productive cool-season grasses, but current germplasm does not exhibit much drought tolerance. However, ecotypes from climates with long severe summer droughts, such as the Mediterranean, may be better adapted to these environments. In the fall of 2007, a collection of orchardgrass plants resulted in the identification of 375 lines from 62 different sites from mainland Greece and the island of Crete. The collection was planted at the Noble Foundation's Red River Farm, located in Burneyville, Oklahoma, in the fall of 2008. Plots were sown in 1.5 x 1.5 m sward plots in a randomized complete block design with two replications. The orchardgrass material was evaluated for persistence, forage quality, morphological characteristics, the expression of summer dormancy and endophyte infection status. After two years of evaluation for persistence, only 34 surviving lines, representing 15 sites remained. Stand persistence of the surviving stands varied ranging from 2 – 44 % and all exhibited some degree of summer dormancy. Crude protein and *in vitro* true dry matter digestibility determined by NIRS averaged 19.9 and 87.4 %, respectively, across lines. Heading dates across lines were similar averaging 133 Julian days. An endophyte-specific PCR protocol identified all lines as endophyte free (E-). These lines have been inter-mated to develop a persistent Mediterranean type orchardgrass population with summer dormant characteristics for evaluation in our dry summer environments. Initial results confirm that the Mediterranean population offers greater persistence than more traditional orchardgrass cultivars.