

Effect of grazing vs. haying harvest management on early and late maturing orchardgrass germplasm

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Perennial forage grasses such as orchardgrass (*Dactylis glomerata* L.) are commonly managed under haying and/or grazing management. Additionally, orchardgrass cultivars are classified according to relative flowering time to allow for maximizing forage mass, quality, and mixture compatibility with perennial legumes. The differences in management strategies and heading makes it difficult to identify the best genotypes for use across management conditions. To better understand these interactions, we conducted evaluations of elite early and late maturing orchardgrass populations at two Utah locations. The objective of these evaluations was to characterize the effect of genotype by harvest management for early and late maturing orchardgrass germplasm. The locations differed in location and soil types (loam vs. sand). At each location, we evaluated early and late families separately, but under both hay and simulated grazing management. We collected data on dry forage mass, heading, stand persistence, cell wall digestibility, and water soluble carbohydrate content. For both maturity classes, there were differences among the included families for the phenotypic data. These orchardgrass populations consist of elite genetics and are ideal for cultivar development. Additionally, we identified strong patterns of genotype by harvest management interaction for the phenotypic traits. These interactions confounded the identification of the best family(ies) across both harvest management conditions. Essentially, there was little evidence of individual families exhibiting high phenotypic performance across both management conditions. The ideal approach to maximize forage production and quality would be to develop orchardgrass cultivars specifically for either hay or grazing production. Unfortunately, limited resources for most breeding programs and changing end-user management objectives make this an unrealistic approach. Alternatively, based on these results we suggest either alternating harvest approaches in the breeding populations, or at a minimum characterizing candidate cultivars in both hay and graze conditions. Ultimately, the resources available to the individual breeding programs will determine the feasibility of any of these approaches.