Quality or Yield: Which is Most Critical? (C06jensen110051-Poster)

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Abstract:

As water resources become limited the need to produce stable amounts of high quality forage increase. An understanding of how levels of irrigation affect crude protein (CP), neutral detergent fiber (NDF), and in vitro true digestibility (IVTD) is critical in pasture forage management. Cultivars of orchardgrass (Dactylis glomerata L.) and perennial ryegrass (Lolium perenne L.) were established under a line-source irrigation system to evaluate trends in CP, NDF, and IVTD across five water levels and three harvest dates and define their relationships with dry matter yield (DMY). Perennial ryegrass forage had higher CP, IVTD, and lower NDF concentrations (g kg-1) than orchardgrass at all harvest dates and within water levels. However, due to decreased DMY in perennial ryegrass cultivars, orchardgrass cultivars produced more total (kg ha-1) CP, NDF, and IVTD. Orchardgrass cultivars Paiute, Pizza, Justus, and Potomac had the highest CP concentrations across water levels. Tetraploid perennial ryegrass cultivars, Bastion, Citadell, and Gambit had increased concentrations of CP, IVTD, and lower NDF levels at each harvest and across water levels than diploid cultivars. The most notable trend in forage quality across water levels was the near linear increase in CP with decreasing levels of irrigation, particularly later in the growing season. Our results indicate that both species can be effectively evaluated for CP, NDF, and IVTD across irrigation levels. However, negative correlations between CP and DMY, particularly early in the growing season, will make simultaneous selection for CP, IVTD, and DMY difficult. To avoid possible declines in DMY in breeding programs to increase CP and IVTD in orchardgrass and perennial ryegrass, DMY also should be monitored.

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