

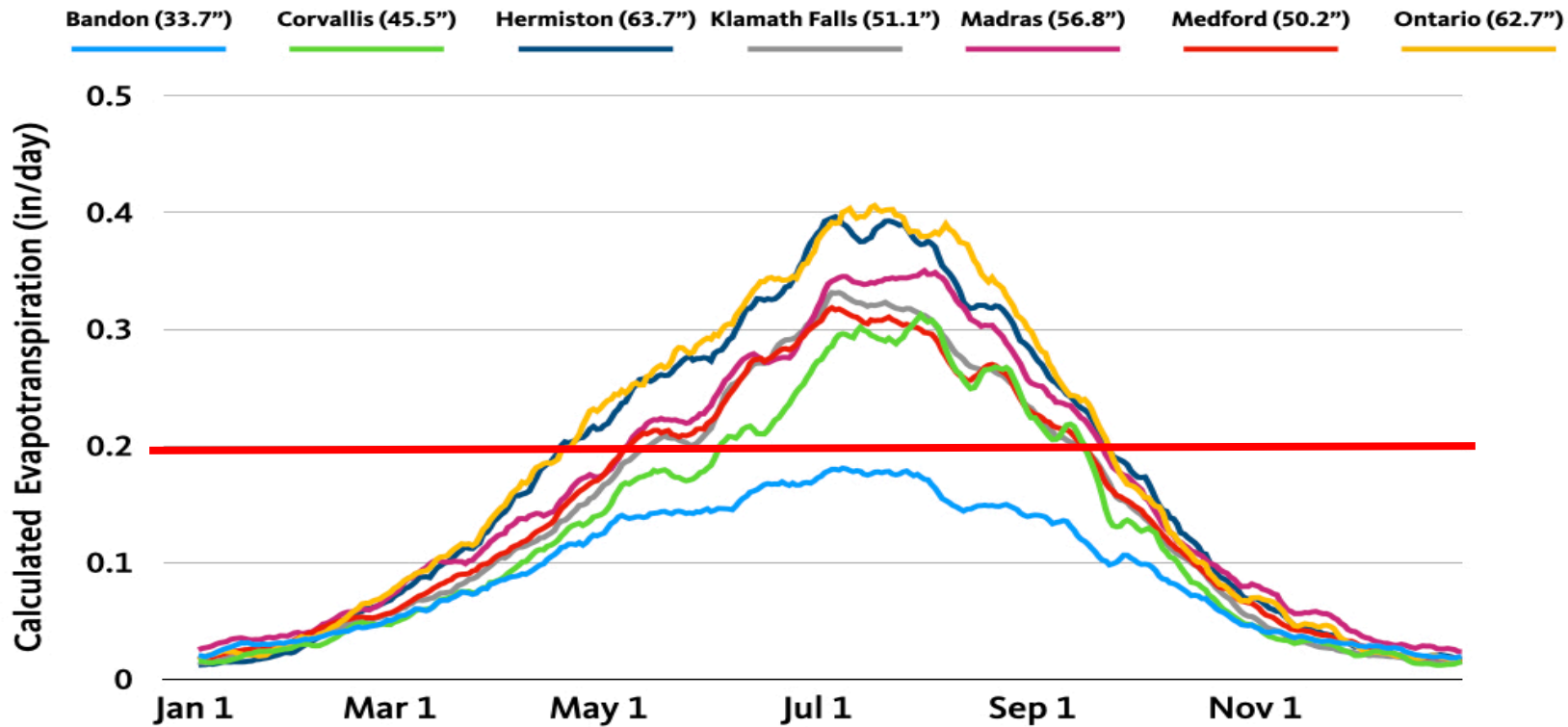
Grass response to seasonal deficit irrigation

Ian McGregor – OSU Extension
919-274-4326 call or text
ian.mcgregor@oregonstate.edu



Oregon State
University

Average Kimberly-Penman Evapotranspiration (2008 - 2018)



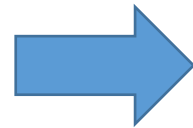
Ten-year average seasonal Kimberly-Penman evapotranspiration patterns for seven sites in Oregon. These reference evapotranspiration values are converted through crop coefficients to determine water use for specific crops like pasture or alfalfa. Data from Bureau of Reclamation. Figure: Gordon Jones, Oregon State University.



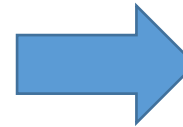
Cool-Season Perennial Grasses Differ in Tolerance to Partial-Season Irrigation Deficits

Steve Orloff, Charles Brummer, Anil Shrestha, and Daniel Putnam

Full season irrigation
Early season cutoff
Mid season cutoff



Wide variety of different cool season forage species and varieties



Full season yield

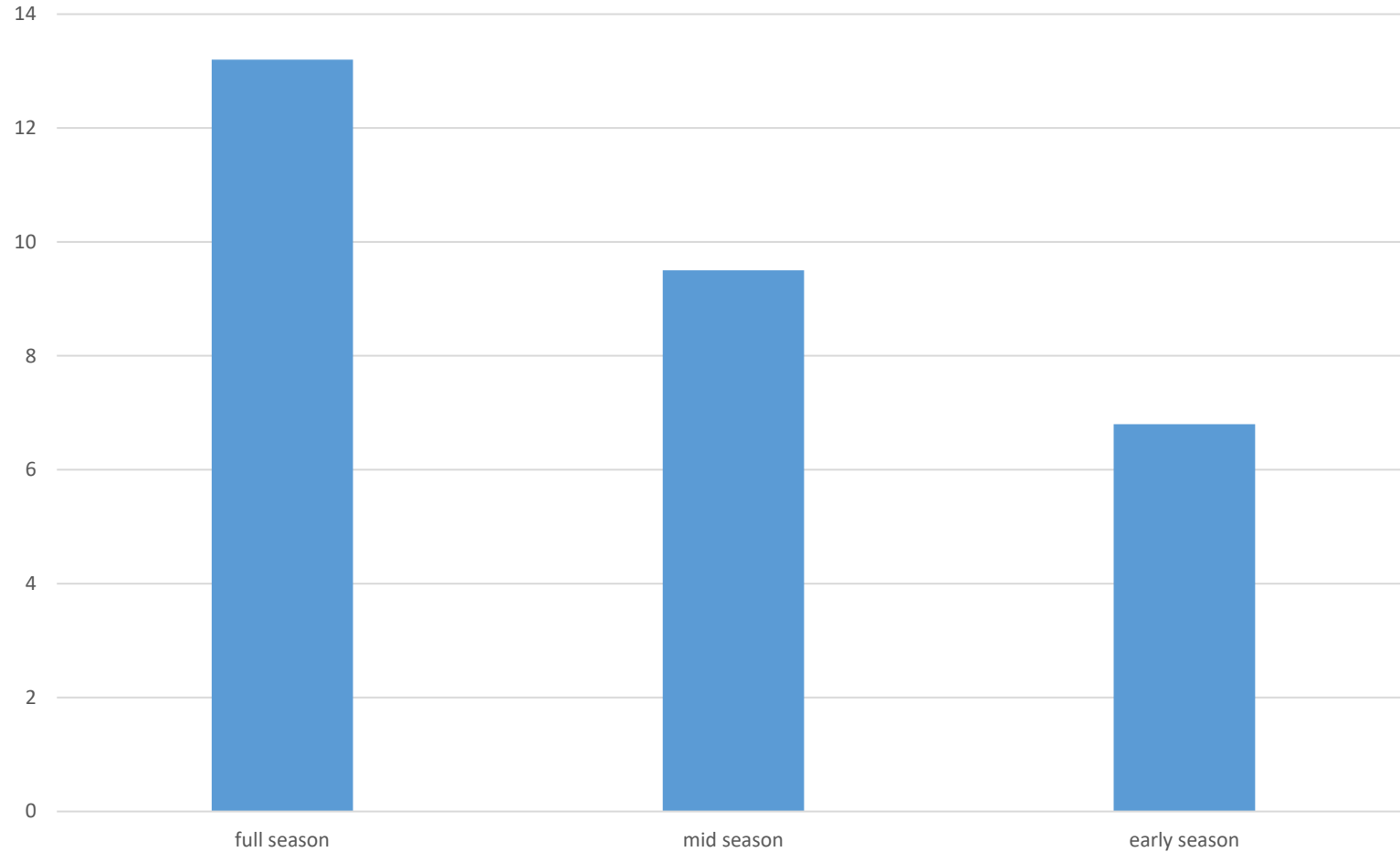
First cutting yield spring AFTER irrigation treatments implemented

Stand rating after 3.5 years of irrigation treatments

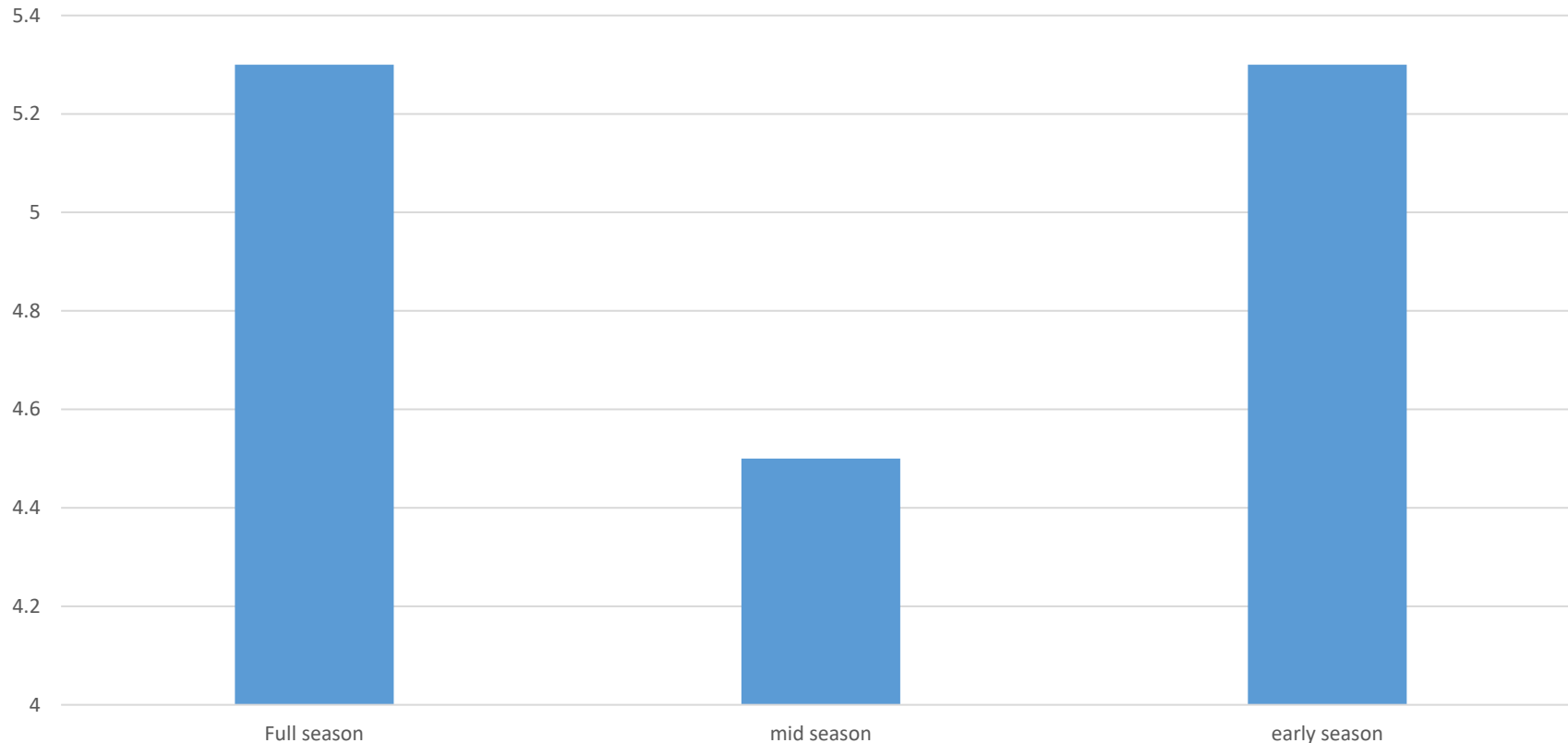


Oregon State
University

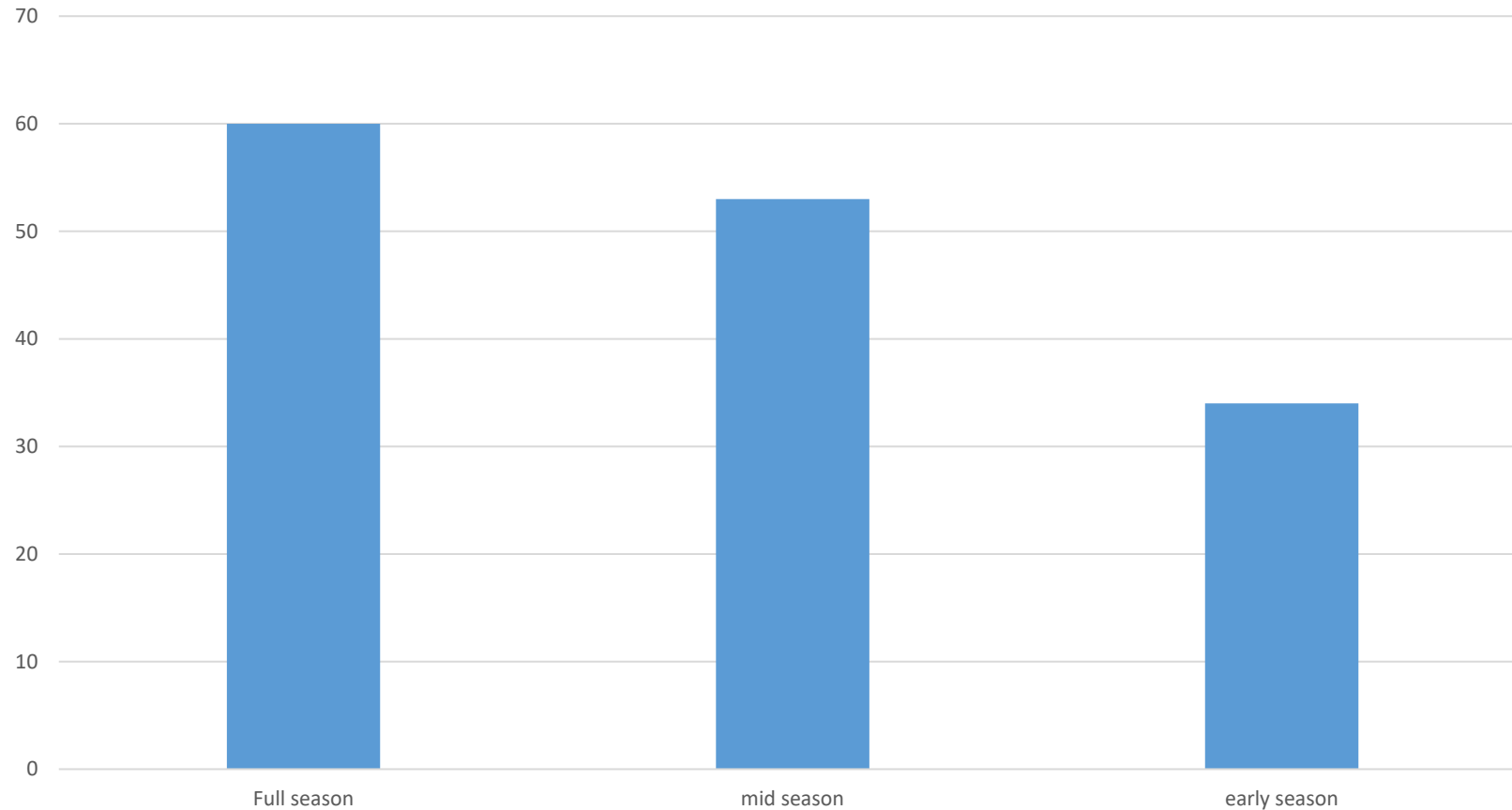
Orchardgrass total annual yield (table 2)



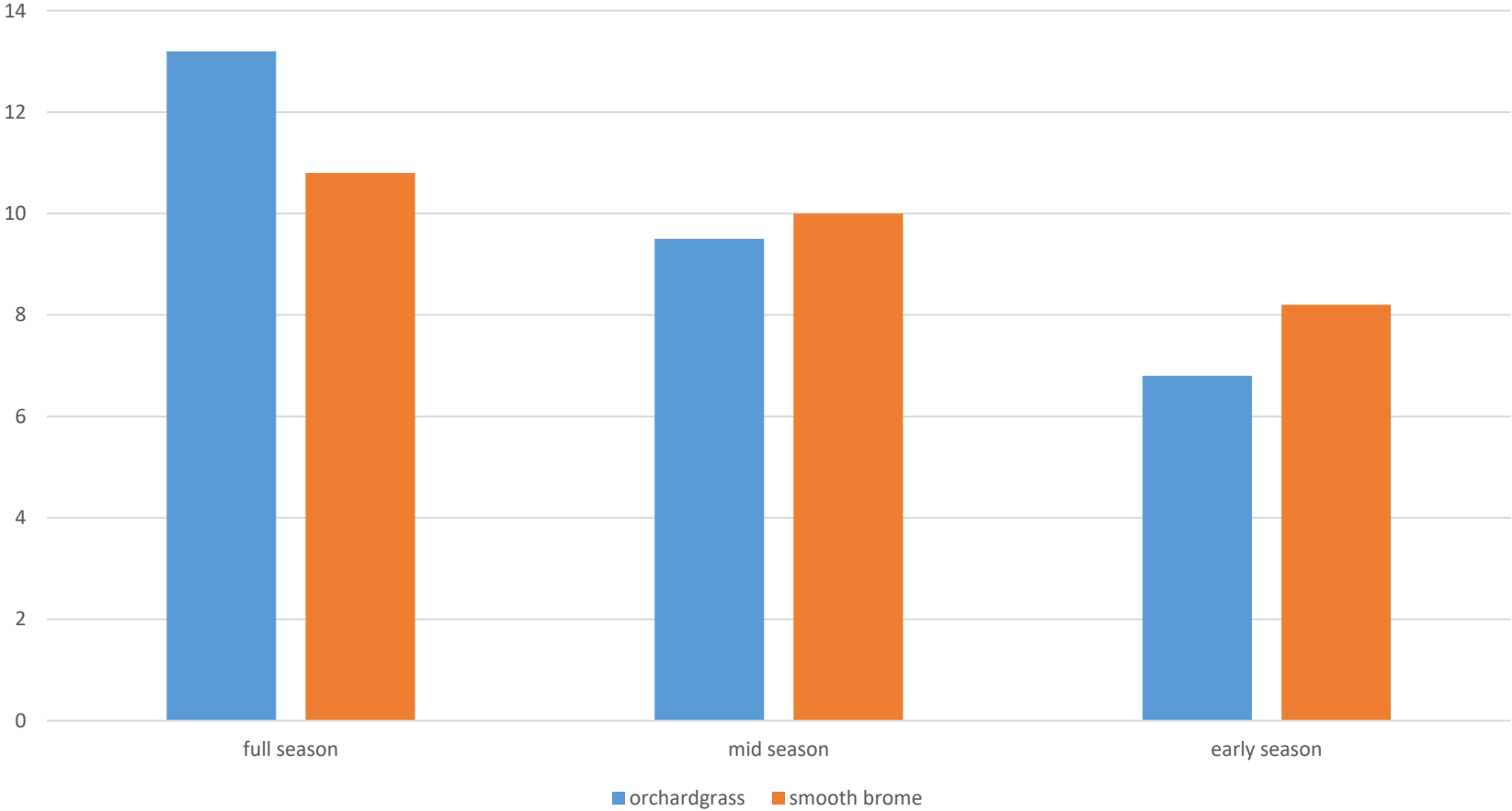
Orchardgrass residual effect of irrigation treatments, first cut yield following spring (table 4)



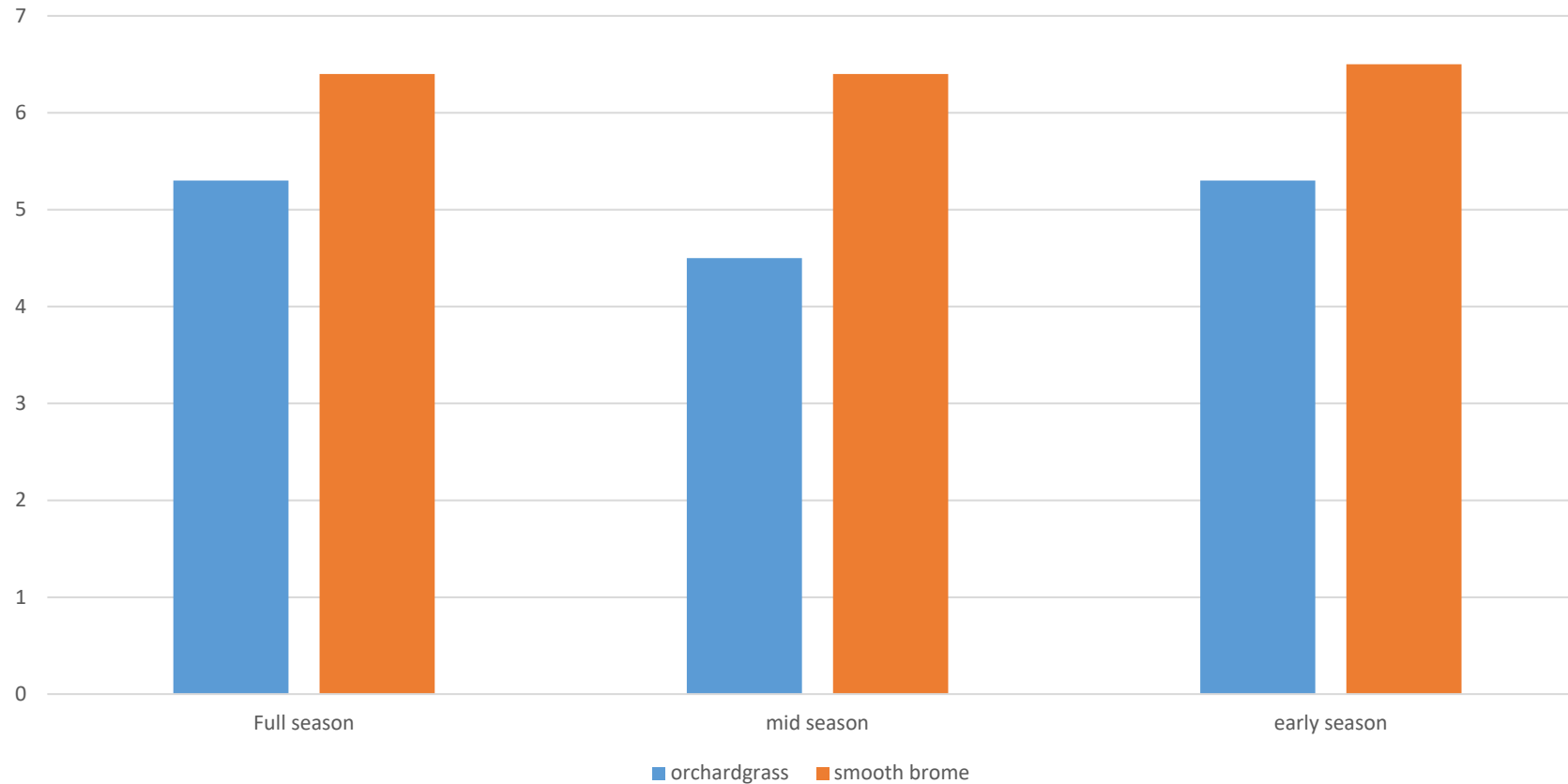
Orchardgrass stand rating (table 5)



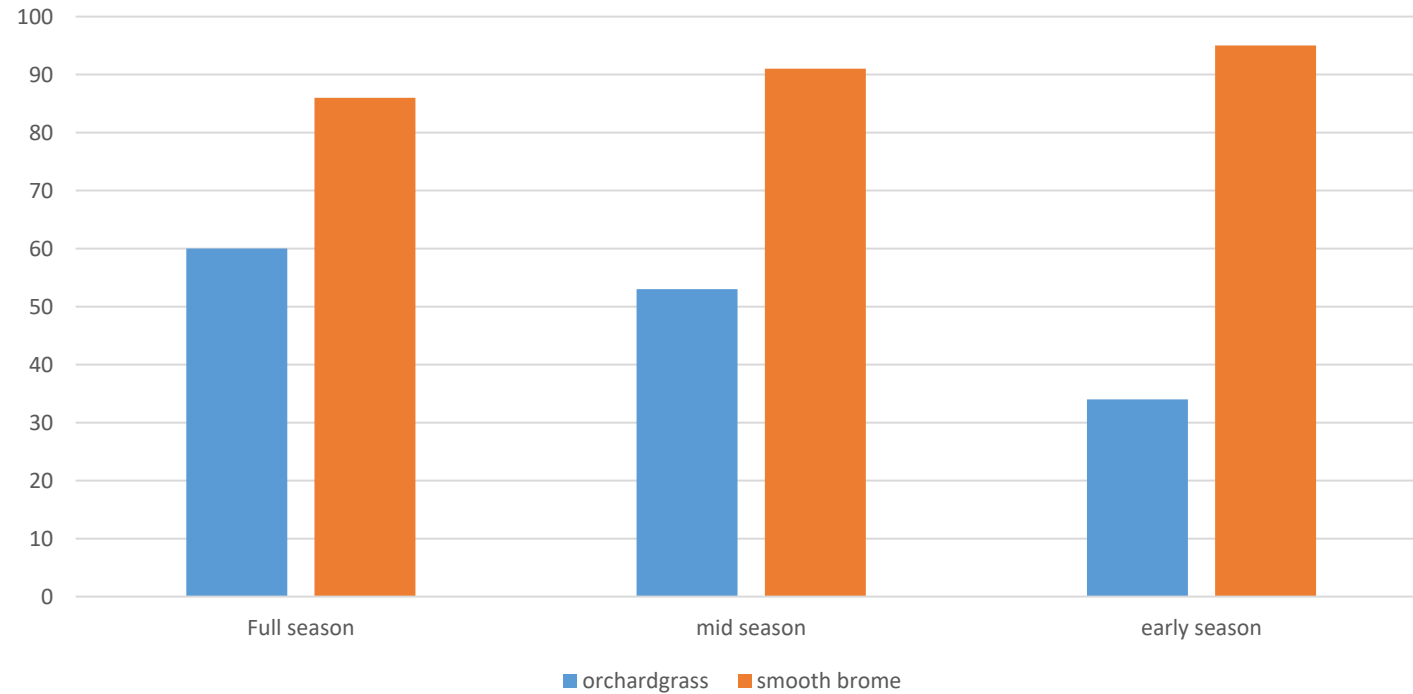
Orchardgrass vs Smooth Brome full season yield (table 2)



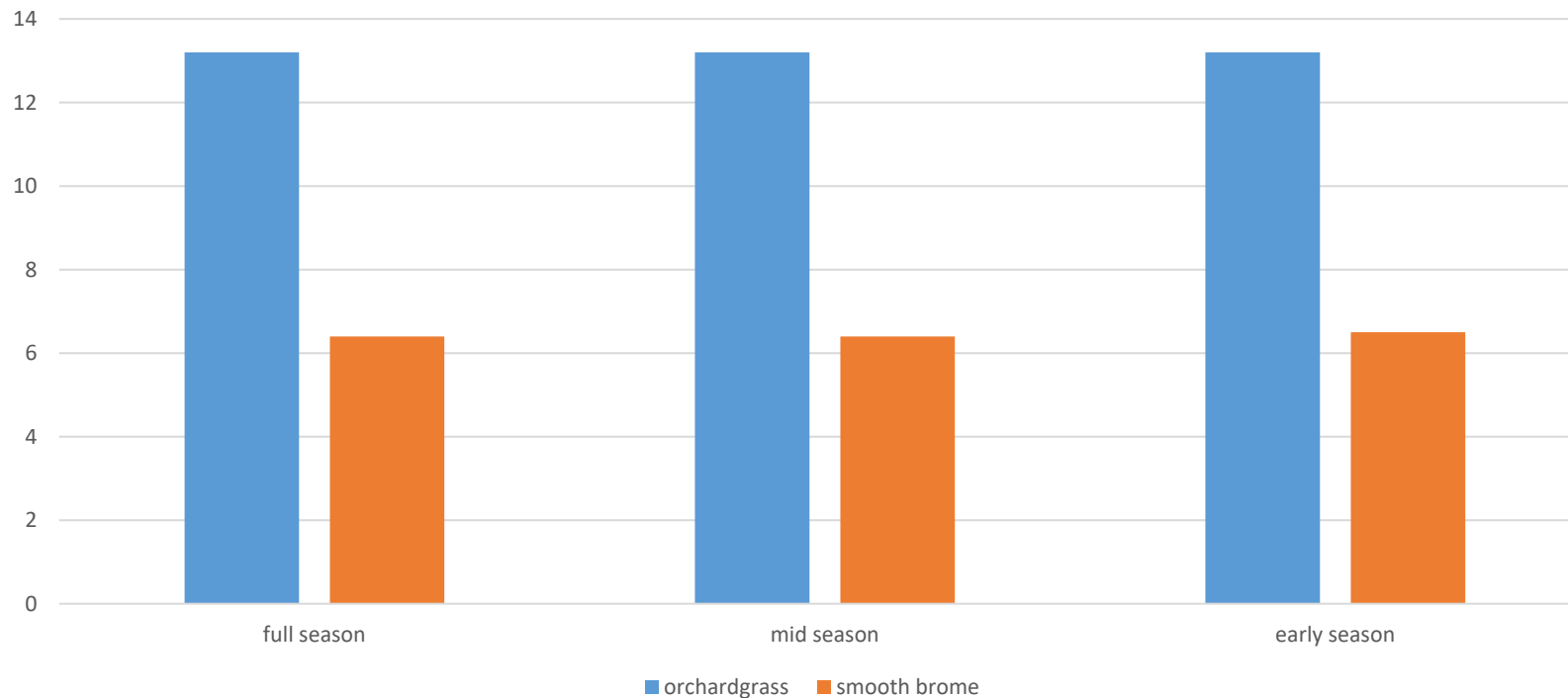
Orchardgrass vs Smooth Brome first cut yield following irrigation treatments (table 4)



Orchardgrass vs Smooth Brome stand rating (table 5)



Orchardgrass full season yield with full season irrigation (table 2) vs Smooth Brome first cutting yield with different irrigation treatments (table 4)

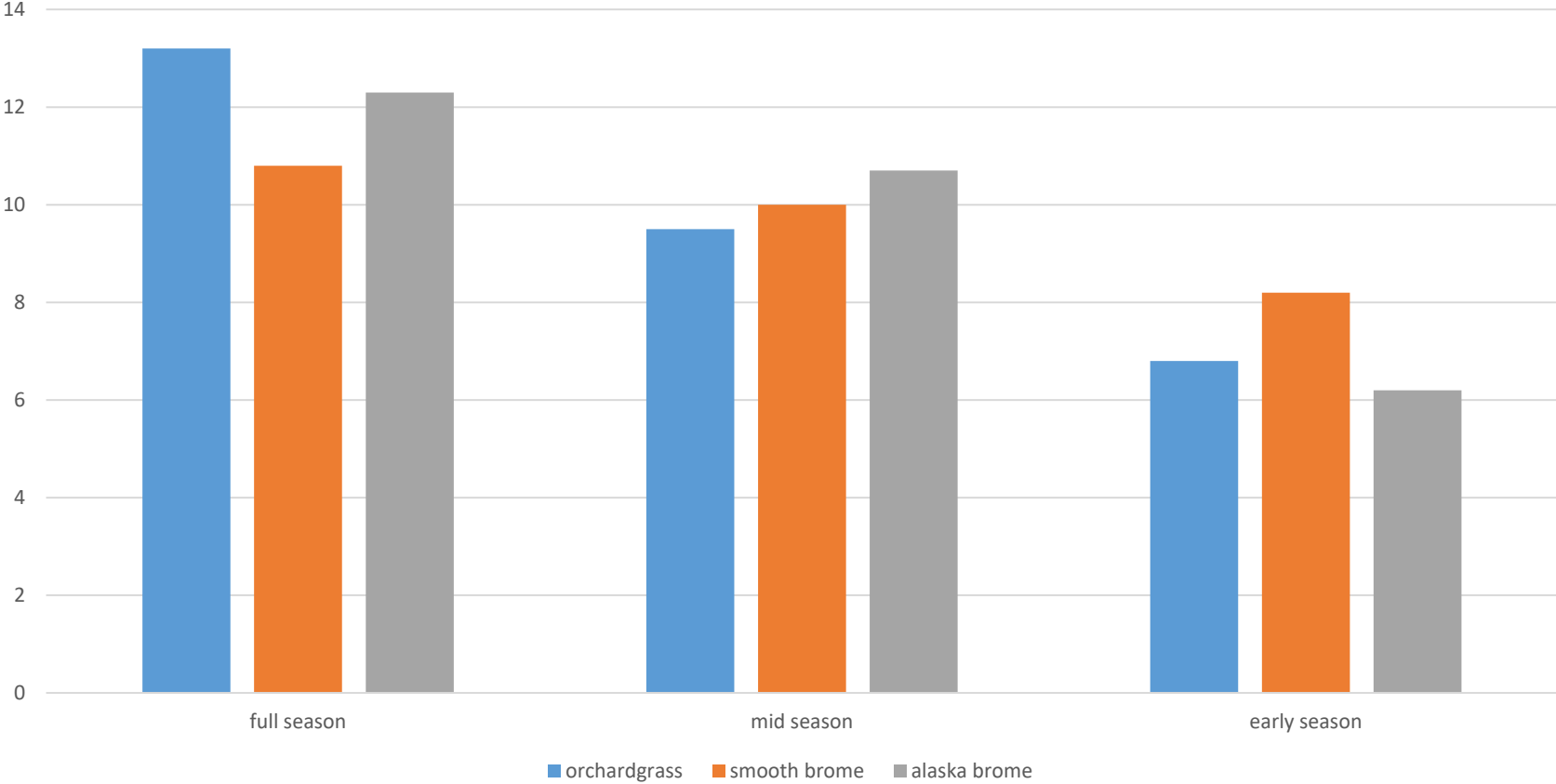


Smooth Brome

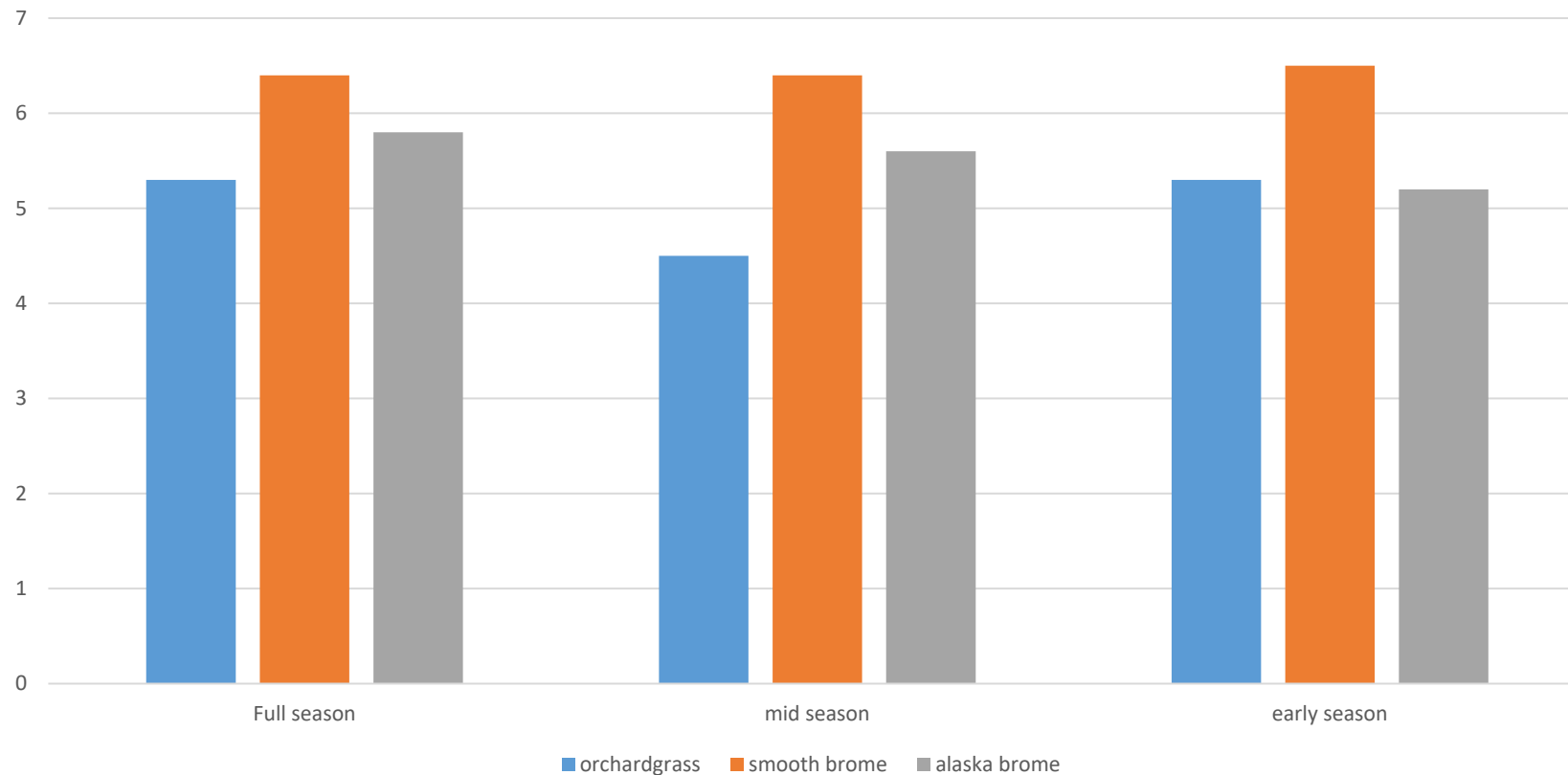
- Great forage quality prior to reproductive maturity
- Yield disproportionately favors first cutting
 - Lots of yield at the beginning of the growing season, and not so much later on in growing season
- Well adapted for early season cutoff



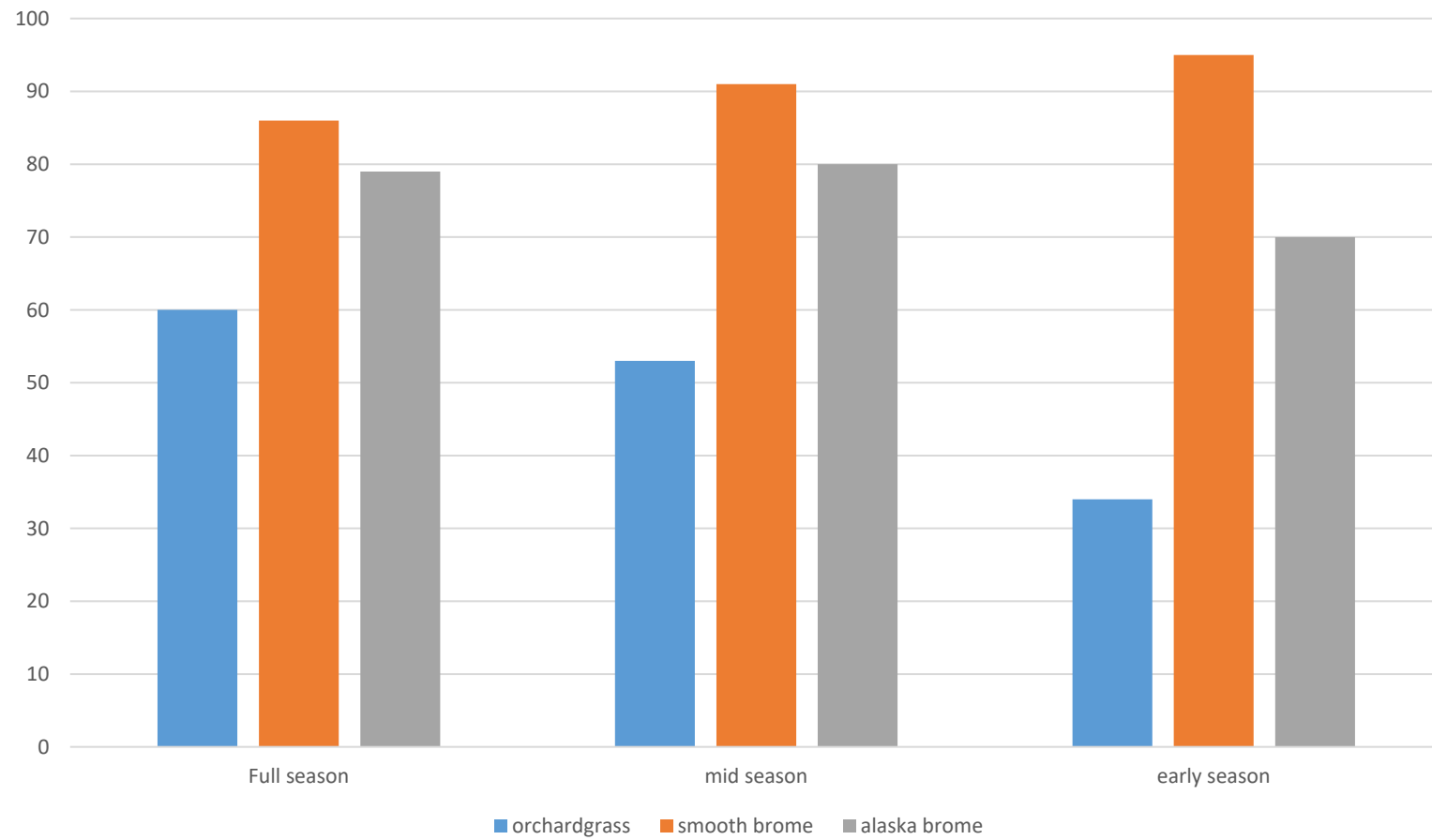
Full season yield with Alaska Brome (table 2)



Spring first cutting yield following irrigation treatments with Alaska Brome (table 4)



Stand rating with Alaska Brome (table 5)

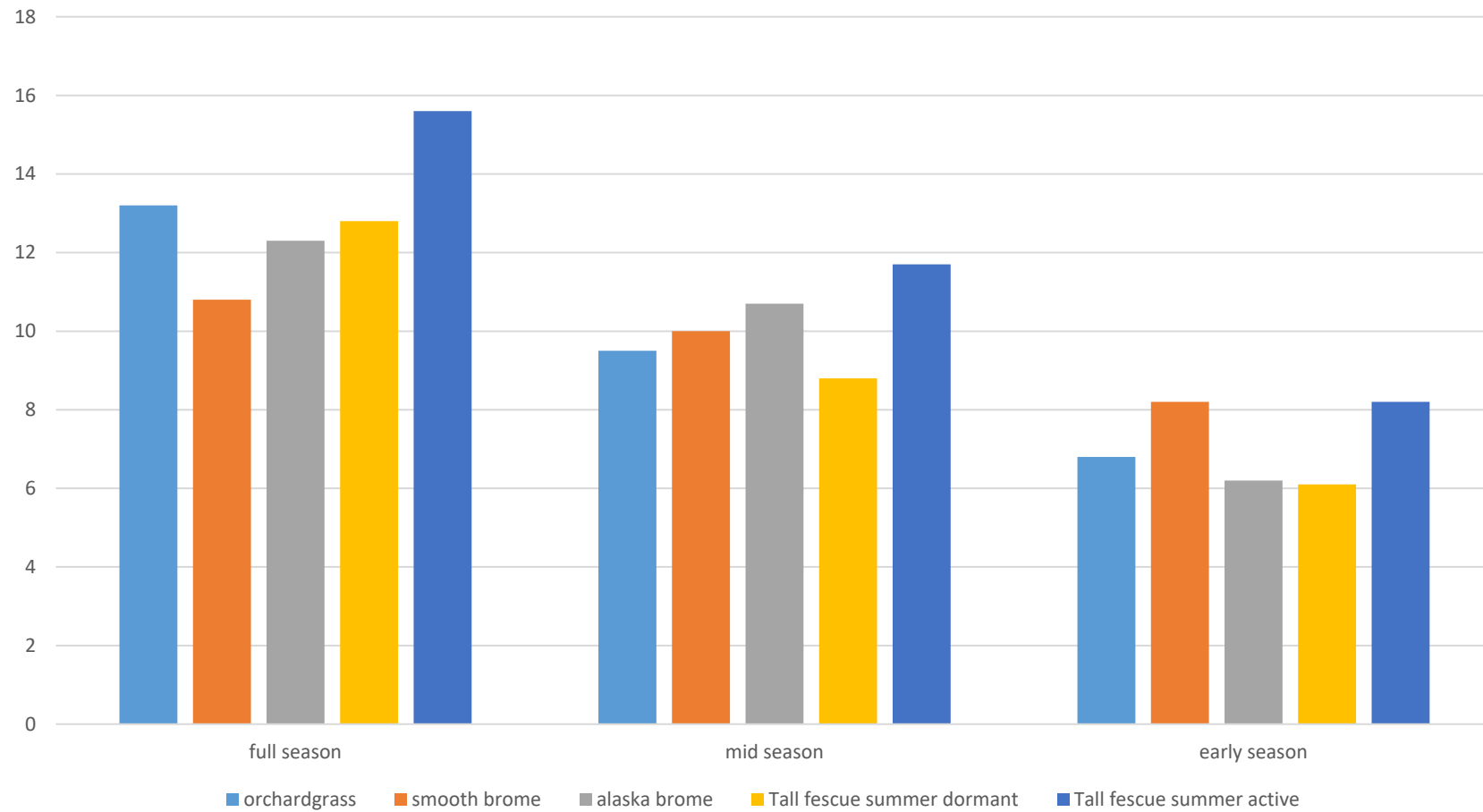


Alaska Brome

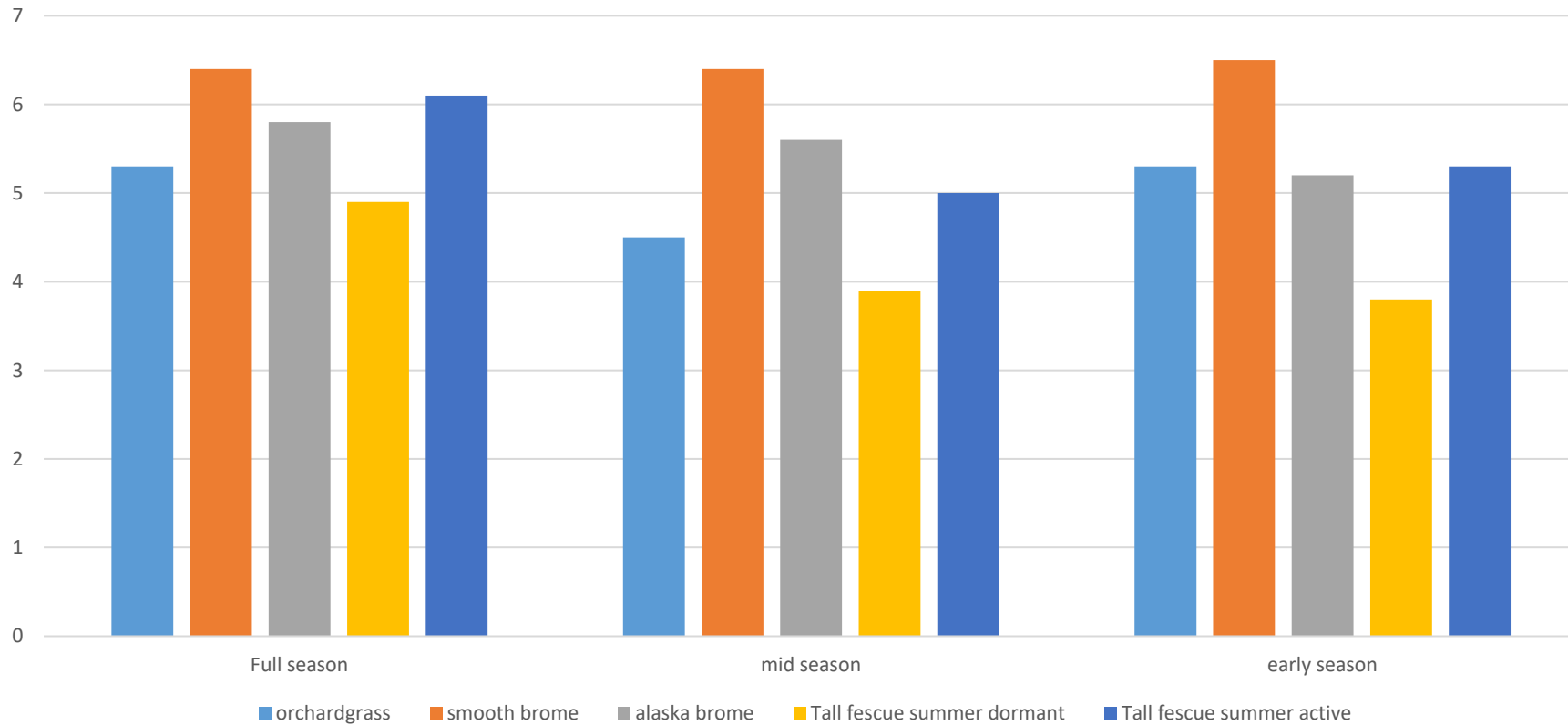
- High in energy, but lacks protein
 - Grows well in pasture with legume
- Yield is fairly well evenly distributed throughout growing season
- Well adapted for mid-season cutoff



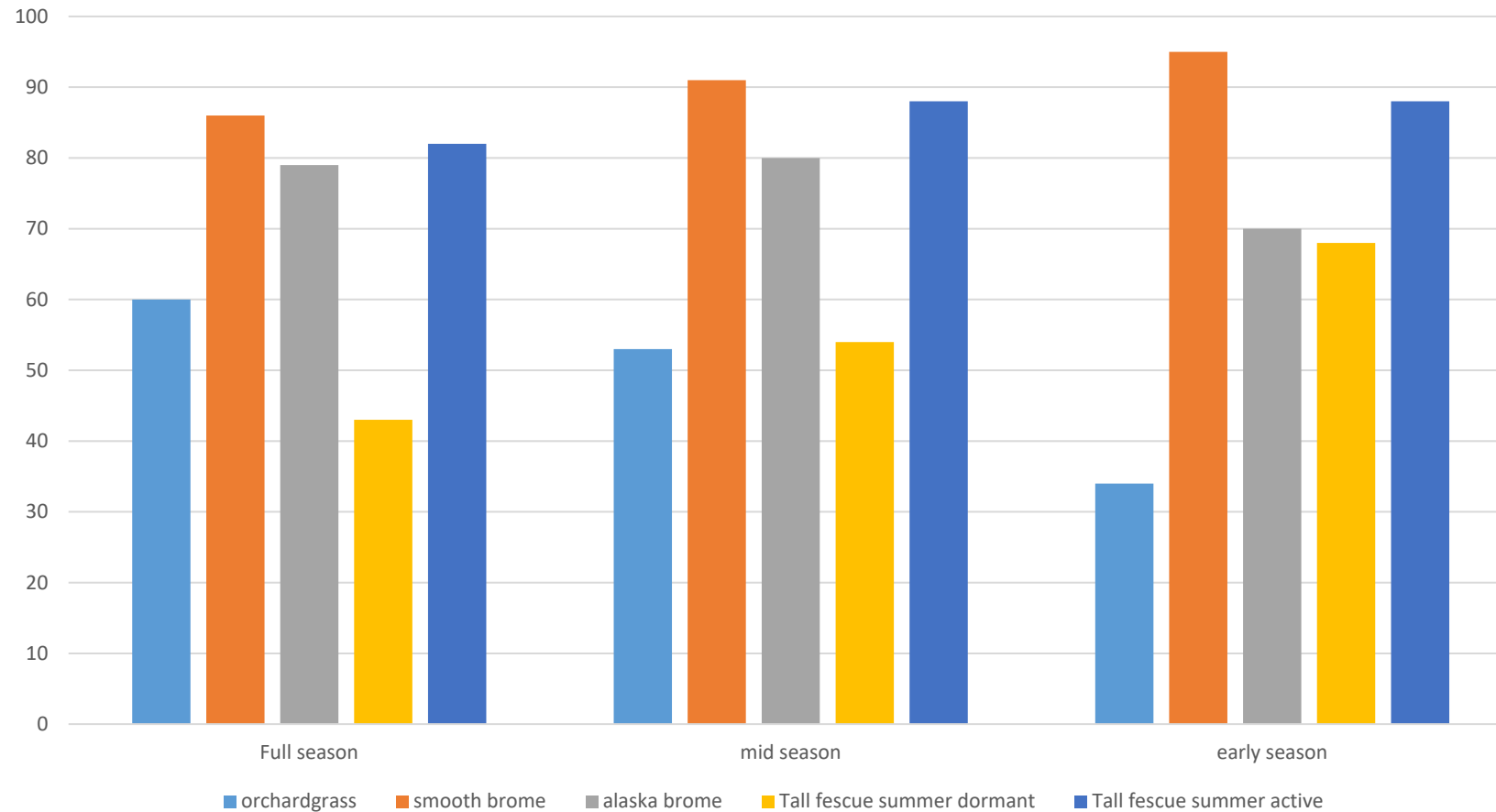
Full season yield with Tall Fescue (table 2)



First cutting yield following year with irrigation treatments with Tall Fescue (table 4)



Stand rating with tall fescue (table 5)



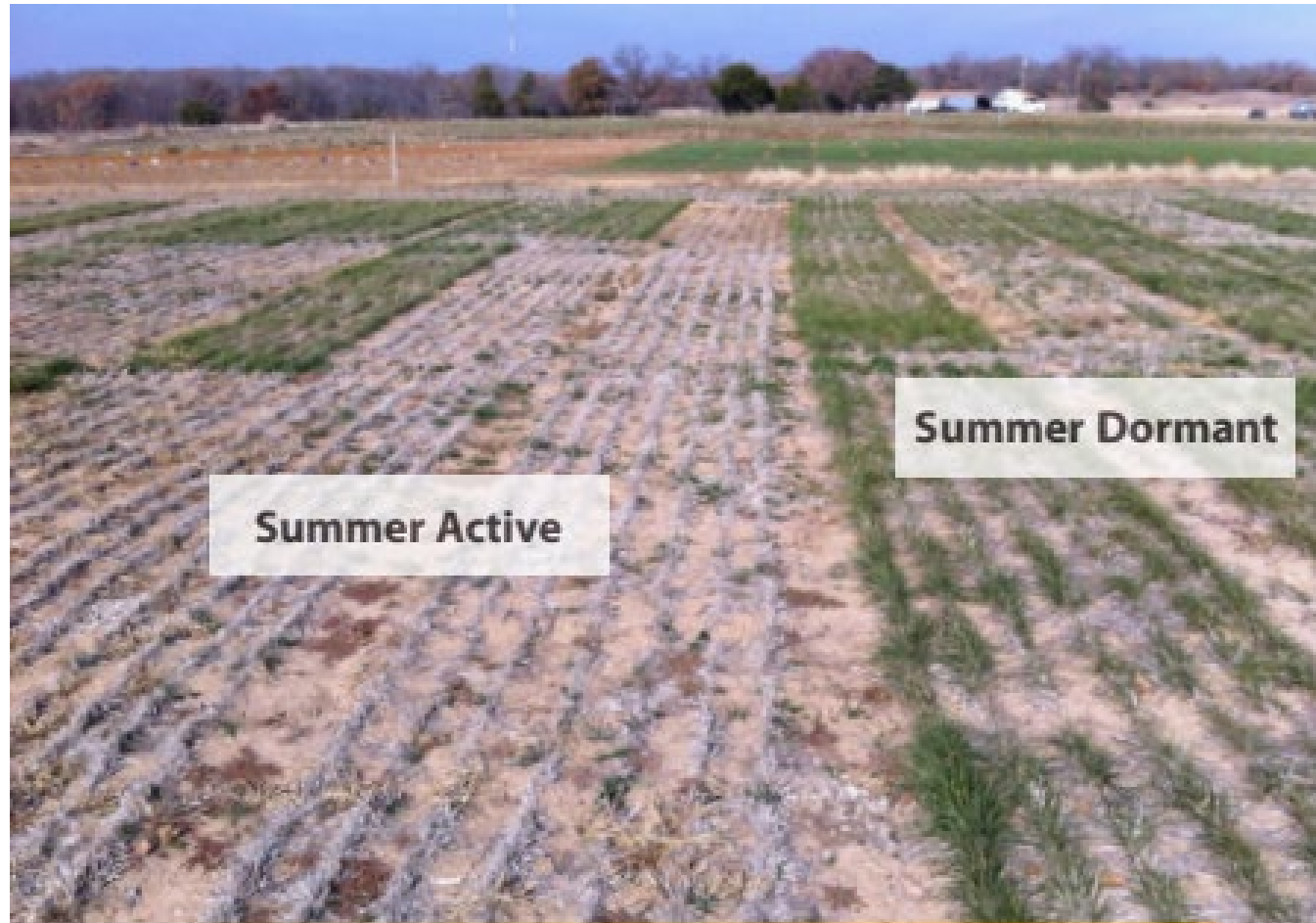


Figure 2. Tall fescue variety trial in southern Oklahoma in autumn, 2011. Trial was sown in October 2010 with excellent stands in all cultivars. Following the extremely hot and dry summer of 2011, only summer-dormant cultivars survived. Photo: C. Brummer.

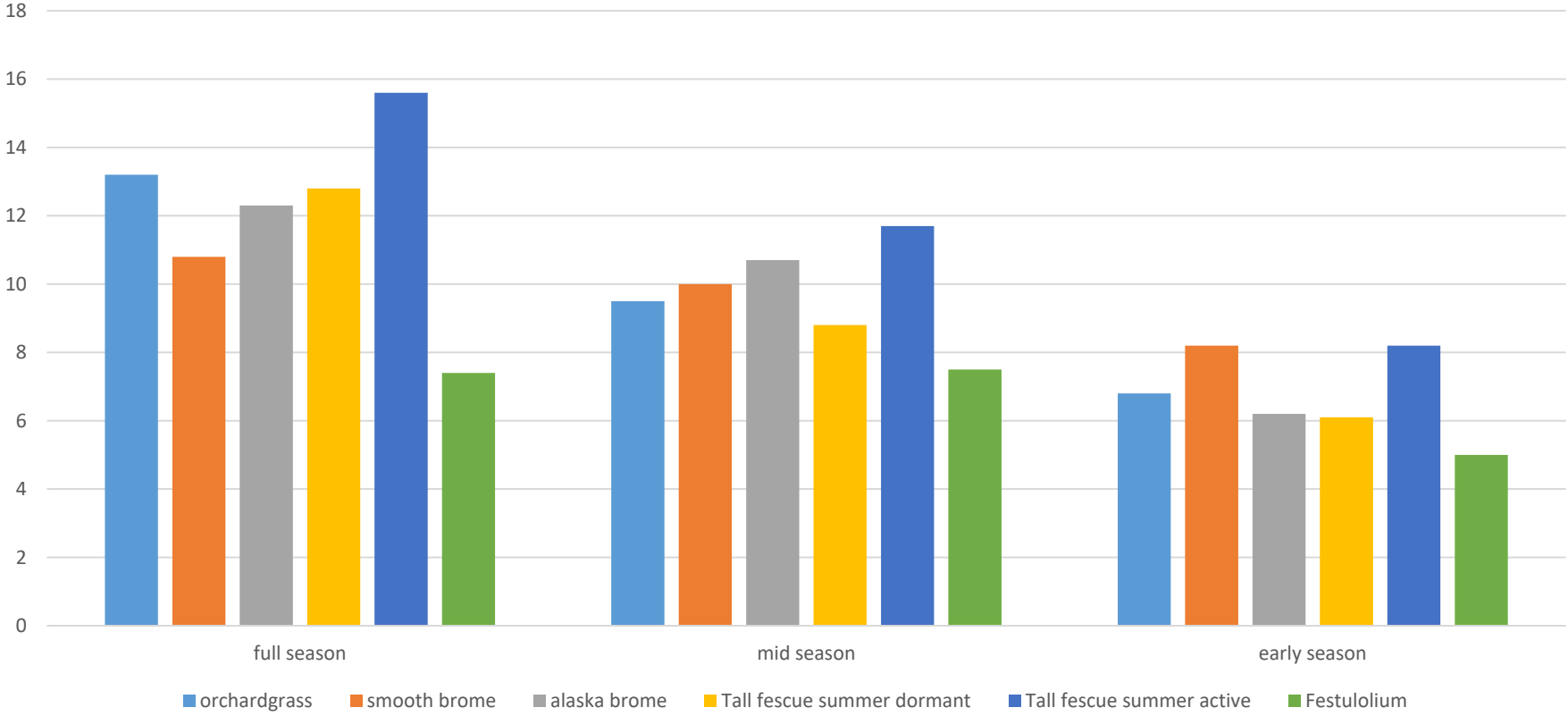


Tall Fescue

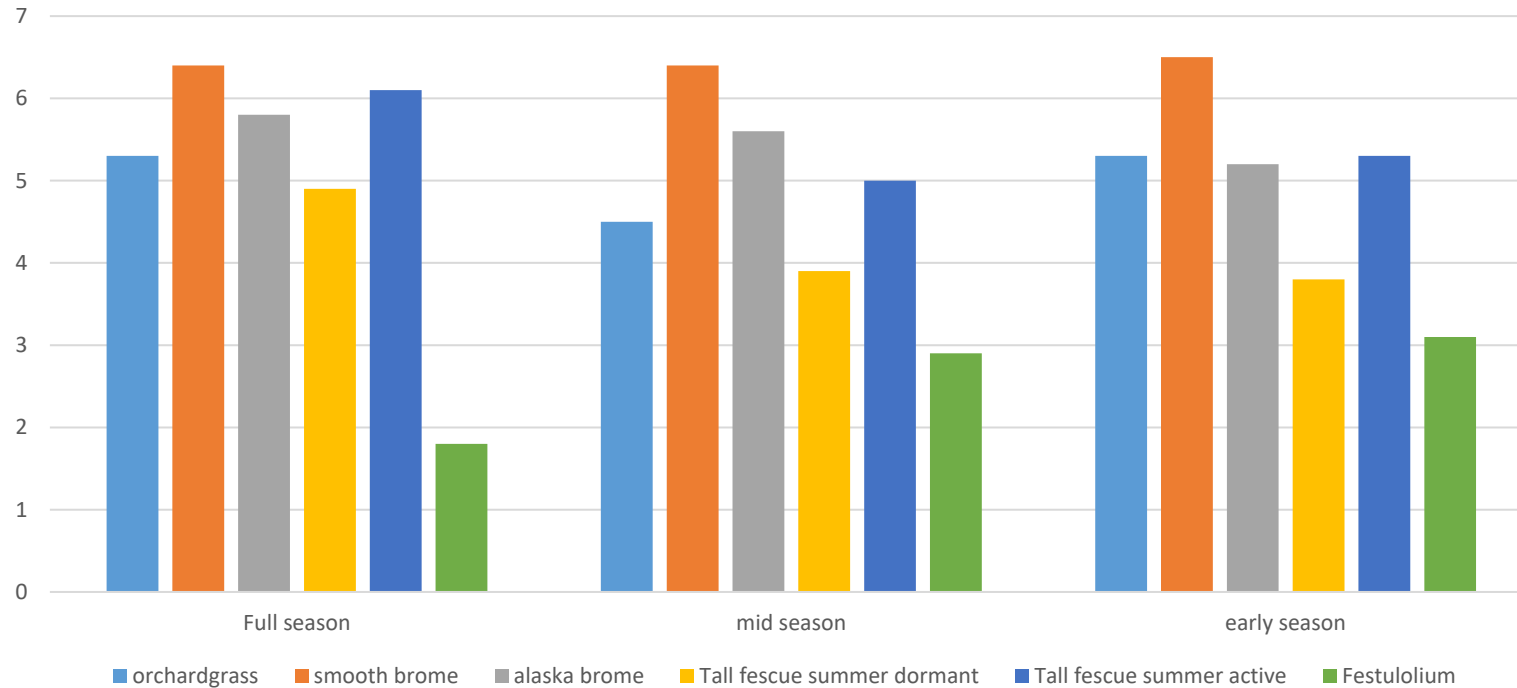
- Highest yielding in favorable water year, particularly summer active varieties
- Both variety types remain resilient through drought years. However, it seems that summer dormant varieties favor water cut-off to go dormant



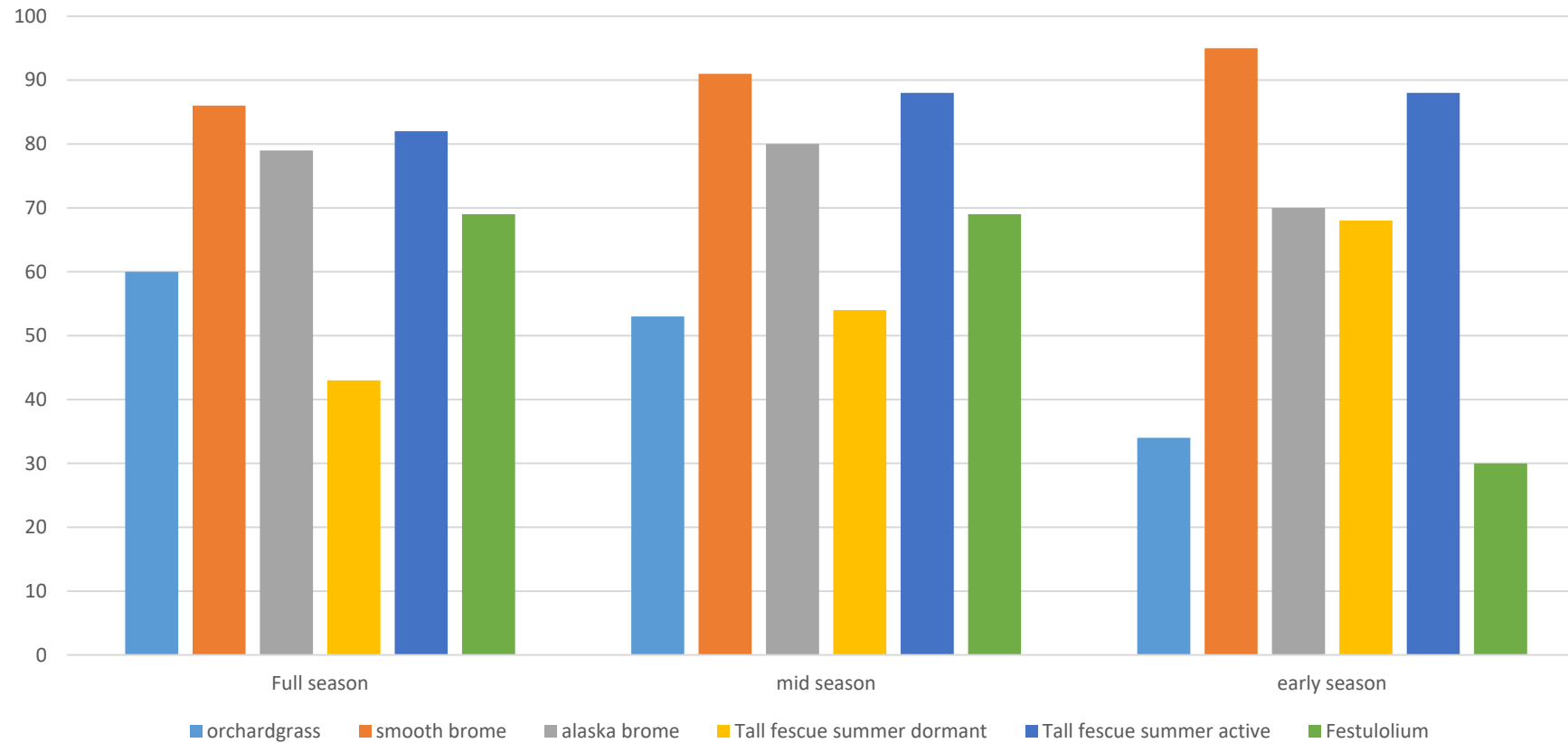
Full season yield with Festulolium (table 2)



First cutting yield following year of irrigation treatments with Festulolium (table 4)



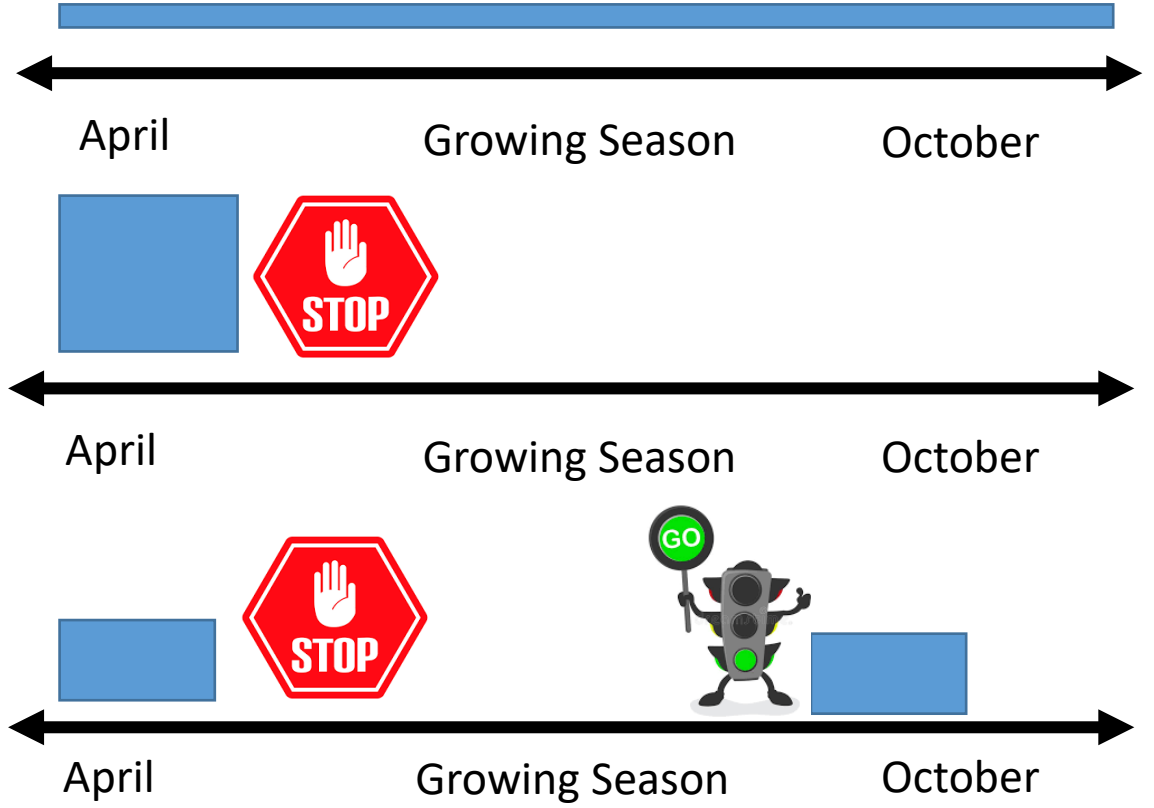
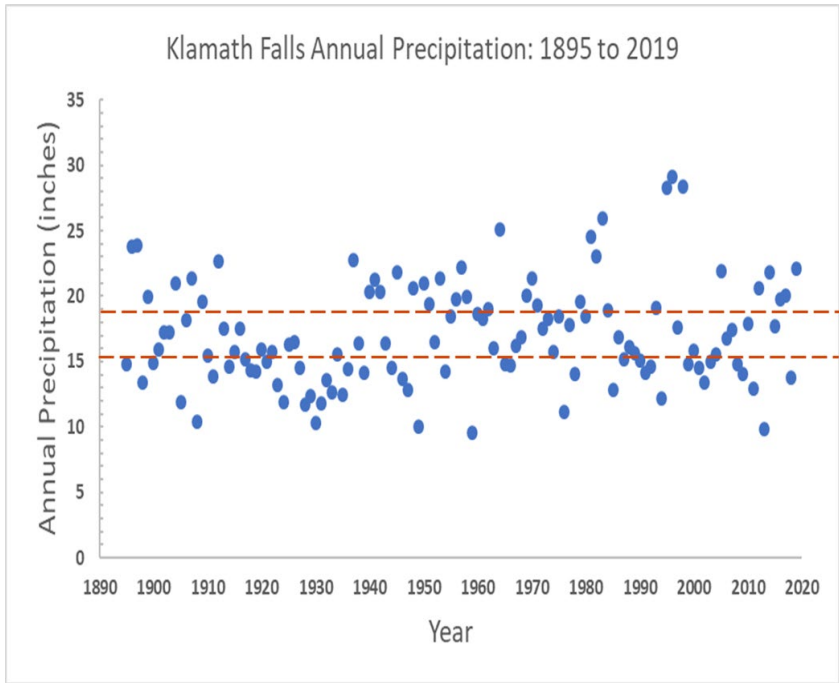
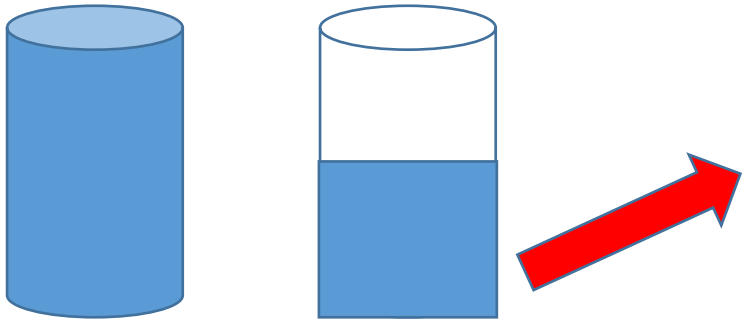
Stand rating with Festulolium (table 5)



Festulolium

- Demonstrates some drought resilient properties, like increased first cutting spring yield following drought
 - Festulolium is Annual Ryegrass x Fescue. Any drought tolerant quality is likely derived from the fescue side of things.
- Lowest yielding across the board
 - Perennial and Annual Ryegrass are short lived species, usually included in pasture mixes to give the pasture a jump-start while longer lived species (I.e. Orchardgrass) are given time to develop
 - This study didn't capture the first year where festulolium was likely doing it's best, and then took data the following 3.5 years when it was likely on the decline





Ian McGregor
919-274-4326 call or text
ian.mcgregor@oregonstate.edu



Oregon State
University