

**Interactive Effects of Grazing, Glyphosate Rate, and Application Timing on Barb Goatgrass Seedhead Production.** Elise S. Gornish<sup>1</sup>, Travis M. Bean<sup>2\*</sup>, Josh Davy<sup>3</sup>, Guy Kyser<sup>1</sup>. <sup>1</sup>Department of Plant and Environmental Sciences, University of California, Davis, CA, USA. <sup>2</sup>Department of Botany and Plant Sciences, University of California, Riverside, CA, USA, <sup>3</sup>University of California Cooperative Extension Glenn, Colusa and Tehama Counties, CA, USA, \*Corresponding author (bean@ucr.edu)

Eurasian winter annual, barb goatgrass (*Aegilops triuncialis*), is increasing its range in western states dominated by cool season precipitation. As an ecosystem transformer, barb goatgrass can permanently degrade rangeland and natural areas, making it a management priority. Conventional management has been largely unsuccessful, due in part to the difficulty of selectively removing undesirable annual grasses from habitats dominated by other annual grasses. Barb goatgrass has been observed to mature later than desirable species. To take advantage of this apparent separation in phenology we implemented a field experiment in five pastures at the University of California Hopland Research and Extension Center in Hopland, CA. In March through May of 2016, we applied glyphosate (Roundup WeatherMax ®) to specific barb goatgrass phenological phases (tillering, boot, heading) at high (394 g ae ha<sup>-1</sup>) and low (1261 g ae ha<sup>-1</sup>) rates in combination with targeted grazing by sheep (32 sheep days in each 324-m<sup>2</sup> plot) at the boot stage. Our goal was to minimize seed production of barb goatgrass while minimizing negative impacts to desirable forage species by evaluating the integrated efficacy of targeted grazing with precisely timed nonselective herbicide application. Plots were surveyed for seedhead densities of barb goatgrass in June 2016. Grazing reduced overall barb goatgrass density by 68%. The presence of herbicide reduced barb goatgrass density by 60% overall, but no differences in density were found between low and high herbicide rates. Spraying goatgrass at the tiller stage resulted in a 99% decline in density compared to other phenological phases. Spraying at the boot stage resulted in a 10% decline in density compared to spraying at the heading stage. No interactions were found among grazing and herbicide rate or herbicide rate and phenological stage at the time of herbicide application.