[19] SEED DORMANCY AND GERMINATION CHARACTERISTICS OF JOINTED GOATGRASS. Lynn Fandrich* and Carol Mallory-Smith, Oregon State University, Corvallis.

Although jointed goatgrass has been the subject of many studies, a thorough characterization of its seed dormancy and germination behavior has not been previously reported. These characteristics were evaluated in several jointed goatgrass populations of Oregon and Washington origin over multiple years. The effects of light, dark, maternal environment, seed structures, temperature, and time were evaluated. Germination was recorded by seed position within the spikelet. Some freshly harvested jointed goatgrass seed germinated when exposed to incubation temperatures that ranged from 5 to 30 C, but the greatest proportion of seed, between 80 and 90%, germinated at 25/15 C alternating day and night temperatures. Seed from primary and secondary florets were similarly affected by temperature. As the duration of after-ripening increased, jointed goatgrass seed germinated earlier, at faster rates, and to greater final percentages compared to dormant seed. Jointed goatgrass seed from both florets were completely nondormant after 16 wk after-ripening at 22 C. Germination of dormant seed from the secondary floret was dependent on temperature and photoperiod. More secondary seed germinated at low (15/15 C) rather than high (30/20 C) temperatures, and photoperiod influenced germination at high temperatures only. The effect of photoperiod was small compared to the effect of temperature. Removal of the spikelet structures improved germination of dormant seed, but not completely relieve dormancy. The effect of maternal environment was significant, and explained approximately 5-10% of the variation in germination. However, this variation was much less compared to the effects of after-ripening and incubation temperature. Because jointed goatgrass spikelets mature and shatter in July, seed from all secondary and most primary florets are capable of germination with moisture in September and October. Tillage and herbicide applications will be most effective in the fall when primary dormancy is lost, but before secondary dormancy is imposed. Dormancy cycling was not studied in our experiments; rather it was reported by Donald (1991). Most freshly harvested jointed goatgrass seed in the secondary floret are non-dormant, and contribute to a transient seedbank with a turnover rate of one year. Dormancy in field populations most likely results from seed in the primary positioned floret. This dormancy is relatively non-deep, most likely of physiological origin, and it is relieved by warm (22 C), dry conditions.