



Wet Thermal Accumulation Modeling of Field Germination of Several Rangeland Species

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Thermal accumulation germination models were created from incubation chamber constant temperature trials for 14 rangeland species and cultivars and used to predict germination at simulated oscillating spring temperatures. Model accuracy was then field-tested for species *Linum perenne* L. (Appar), *Achillea millefolium* L. (Eagle and VNS White), *Agropyron cristatum* (L.) Gaertn. x *Agropyron desertorum* (Fisch. ex Link) J.A. Schultes (Hycrest), *Elymus elymoides* (Raf.) Swezey (Sanpete), *Psuedoroegneria spicata* (Pursh) A. Love (Anatone), and two populations of *Bromus tectorum* L. Three water thresholds and two thermal accumulation methods were compared for accuracy in predicting field germination of seeds in buried seedbags. Models developed from constant temperatures overestimated time to germination for both simulated spring temperatures in the lab and actual field conditions. *Bromus tectorum* populations had lower thermal accumulation requirements than perennial species. Forb species *Achillea millefolium*, *Enceliopias nudicaulis*, and *Lupinus arbustus* had higher thermal accumulation requirements than other species. Totaling thermal accumulation for all periods when soil water potential was greater than -1.5 MPa resulted in highest model accuracy overall (93-100% correct). Highest model accuracy was observed for the two *Bromus tectorum* populations (80-94% and 74-91%). Germination models accuracy was lowest during colder temperatures (53-99%).

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