**Predicting Prairie Weed Community Emergence During Drought: A 1930's Dust Bowl Case Study**

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Sustainable weed control for Prairie field crop farmers may be challenging with a changing climate. The Prairie provinces of Manitoba, Saskatchewan, and Alberta have areas located in a productive semi-arid steppe known as Palliser's Triangle which historically experienced reoccurring dry conditions and historic droughts. Climate change is anticipated to induce more frequent and severe drought conditions. Weed communities being naturalized, typically invasive populations contain greater genetic diversity to withstand diminishing environments such that infestations may increase with drought. Understanding how weeds emerge in drought conditions helps anticipate potential changes in management intervention timings. A literature review was conducted to gather weed emergence models for Prairie species using thermal and hydro-thermal considerations. Historical temperature and precipitation data from Swift Current during the 1930's dust bowl was used for simulations. Differences in hydrothermal and thermal time were evaluated to assess the impact of limited moisture on subsequent weed emergence. The predicted 50% emergence date for wild oat shifted by 52 days, kochia by 24 days, and volunteer wheat by 118 days. The predicted false cleavers emergence using hydrothermal time did not reach 50%. The difference in 20% emergence was 240 days with emergence onset in early November. Unfortunately, no hydrothermal time models were available for wild buckwheat, green foxtail, and volunteer canola. Drought may promote weed emergence later in the growing season after typical timings for chemical interventions have passed. Achieving good canopy closure at this time would be likely challenging due to limited moisture for the crop. Their ability to survive and reproduce would escalate management issues including resistance risk in subsequent years. Model availability for Prairie biotypes for some species are limited and additional research into thermal and hydrothermal responses to additional weeds both spatially and temporally is required.