

MODELING WEED EMERGENCE. Krishona Martinson, Beverly Durgan, Jochum Wiersma, and Frank Forcella. Assistant Extension Professor, Professor, Assistant Extension Professor, and Research Agronomist. University of Minnesota, St. Paul, MN 55108 and USDA-ARS, Morris, MN 56267.

Wild oat is an economically important annual weed throughout small grain producing regions of the United States and Canada. Timely and more accurate control of wild oat may be developed if there is a better understanding of wild oat emergence patterns. The objectives of this research were to evaluate the emergence pattern of wild oat, and determine if emergence can be predicted using soil growing degree days (GDD) and/or hydrothermal time (HTT). Research plots were established in the Red River Valley of Minnesota and North Dakota from 2002 to 2006. On a weekly basis, naturally emerging wild oat plants were counted and removed from six 0.37 m<sup>2</sup> permanent quadrats randomly distributed in a wild oat infested area. This process was repeated until no additional emergence was observed. Base soil temperature and soil water potential were determined to be 1 C and -0.6 MPa, respectively. Wild oat emergence was significantly correlated with GDD and HTT but not calendar days. A Weibull function was fitted to cumulative wild oat emergence and GDD and HTT. The GDD and HTT models closely fit observed wild oat emergence patterns. The later model is the first to use HTT to predict wild oat emergence under field conditions. These models will aid in the future study of wild oat emergence and assist growers and agricultural professionals with planning timely and more accurate wild oat control.