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Up-to-date Biography
Grew up in the Northwest (Seattle)
1991 B.A. from Reed College, in Portland Oregon, in Physics
1994 M.A. from the University of Texas at Austin in Statistical Mechanics
2001 Ph.D. from Montana State University in Land Resources and Environmental Science.

Currently
Department of Agronomy, Assistant Professor and Weed Ecologist at University of Wisconsin, Madison.

Research interests
Spatial and temporal forecasting and management of weed populations

DEPENDENCE OF WEEDS ON WEATHER

Ed Luschei [1]

Variation in the life-history of weeds, for instance the timing of emergence or flowering, can determine whether management succeeds or fails to controlling crop losses and further weed seed inputs into a farming system. Greater knowledge about the timing of life-history events may help us more effectively utilize both chemical and mechanical control measures. Scientists and nature buffs have for some time recorded observations of when different species emerge and flower.   Those prone to recording such observations are called "phenologists" from the Greek meaning "the study of appearance".   Although knowledge about the average timing of phenological events can be helpful in assessing appropriate management strategies, we are also interested in knowing if we can predict deviations from mean behavior on the basis of the weather patterns in any given season. One approach to basing phenological prediction from weather data is to use thermal-time (e.g. growing degree days) or hydro-thermal-time models for particular species.   Software has been developed by the ARS for a suite of important corn belt weeds and can be downloaded for free from the internet :

http://www.mrsars.usda.gov/morris/products/weedcast/weed2.htm

An alternative to explicitly modeling the manner in which the environment impacts weed phenology is to use within season observations in conjunction with the historical correlation between events of different species. In this talk I look at data set spanning 4 years and greater than 80 annual, biennial and perennial weeds gathered by Dr. Jerry Doll at the Arlington Research Station in south central Wisconsin. I demonstrate that early in the season, the first emergence timing of the entire weed community tends to respond similarly to weather (in other words if one weed tends to be early relative to its historical mean, then another weed that tends to emerge soon after will also tend to be early relative to its historical mean). By using historical correlations between species or sets of species, we can use weeds to "integrate" the effect of the environment as opposed to explicitly modeling how the environment influences phenological variation. I go through an example where the first emergence of Lambsquarters is forecast from an observation of giant ragweed emergence and determine that prediction errors can be decreased by almost 50% compared to using the historical means alone.

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