Improving Weed Germination Models By Incorporating Seed Microclimate And Translocation By Tillage

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Weed emergence models are of critical importance in deciding the timing of field weed control measures (tillage or chemical). However, the state of weed germination modeling is still in its infancy. Existing models do provide a baseline picture of emergence patterns, but improvements are needed to make these models universal. The purpose of this ongoing project is to improve germination prediction by including additional models to aid in the simulation of soil microclimate conditions as well as the distribution of seeds following tillage. In this fashion, we can match soil microclimate conditions with predicted seed density at that depth. This leads to an improved prediction mechanism since both temperature and soil moisture are highly variable on a centimeter scale. We can now match the microclimate conditions with where the seeds are, thus improving germination predictions. Two stand alone models have been completed and are available currently which can be downloaded from the USDA-ARS web page (*http://www.ars.usda.gov/mwa/ncscrl*) and incorporated into any existing model. Work is ongoing to bundle these currently stand alone products into an improved modeling framework for weed germination prediction.

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