GRADUATE STUDENT CLIMATE ADAPTATION PARTNERS (GRADCAP) WEBINAR SERIES

USING A CROP MODEL TO ASSESS CLIMATE ADAPTATION STRATEGIES FOR POTATO-GRAIN SYSTEMS

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Maine's potato and grain industries may be particularly sensitive to the changes in weather and weather variability that are predicted with climate change. The crop simulation model DSSAT (Decision Support System for Agrotechnology Transfer) allows us to evaluate climate resilience strategies (i.e. irrigation, planting date, soil health) for potato and grain systems in Maine.

Weather variability has the potential to impact year-to-year yield stability, thus, sustainability in agriculture. Based on current climate change predictions, it is anticipated that weather variability will increase, with effects varying nation-wide. Farmers are confronted seasonally with the challenges and unpredictability weather can bring. Using the computer simulation model DSSAT (Decision Support Systems for Agro-technology), we aim to assess climate adaptation strategies for potato and grain systems in the Northeast. Using numerous years of field data, we are currently in the process of calibrating and evaluating DSSAT for our region.

The working model will then be used to simulate crop yield for potato and grain systems under three distinct weather scenarios: the last 15-year period 2004-2018, which exhibited highly variable weather both between year and within year; a more stable 20-year period, 1970-1989; and a future 20-year period, 2050-2069. Soil health and irrigation will be evaluated as adaptation strategies for their ability to reduce negative impacts of weather variability on total fresh yield and year-to-year yield stability. The goal of this research is to inform Maine farmers on the risks associated with increased weather variability and provide management strategies for reducing risk under various climate scenarios.

ATLANTIC DRY TUBER RAINFED FINAL YIELD
(AMENDED AND NON-AMENDED)

$y = 0.9966x$
$R^2 = 0.5949$
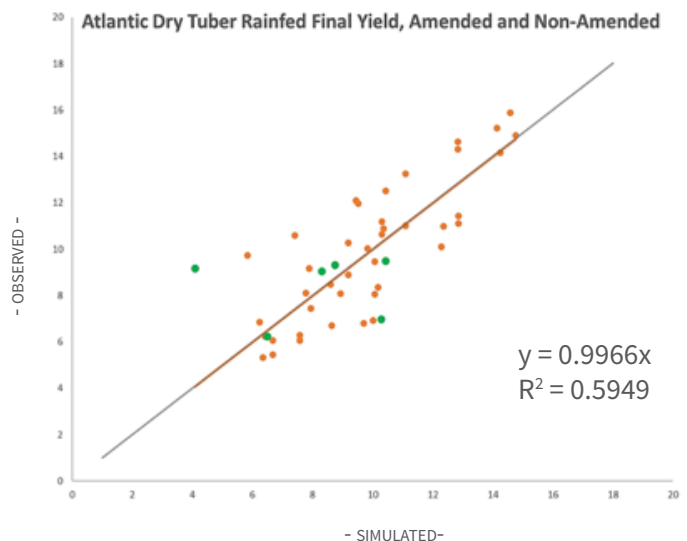
This figure is an initial evaluation of the model's ability to predict experimental yield. Experimental final yield data is plotted against simulated final yields for Atlantic Potato in Maine with non-organically-amended experiments in orange, and organically-amended experiments in green.