



Oregon State University
Department of Agricultural and Resource Economics

Seminar

“Estimating the Impact of Climate Change on Crop Yields: The Importance of Nonlinear Temperature Effects”

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The United States produces 41% of the world's corn and 38% of the world's soybeans, so any impact on US crop yields will have implications for world food supply. We pair a panel of county-level crop yields in the US with a fine-scale weather data set that incorporates the whole distribution of temperatures between the minimum and maximum within each day and across all days in the growing season. Yields increase in temperature until about 29C for corn, 30C for soybeans, and 32C for cotton, but temperatures above these thresholds become very harmful. The slope of the decline above the optimum is significantly steeper than the incline below it. The same nonlinear and asymmetric relationship is found whether we consider time series or cross-sectional variation in weather and yields. This suggests limited potential for adaptation within crop species because the latter

includes farmers' adaptations to warmer climates and the former does not. Area-weighted average yields given current growing regions are predicted to decrease by 31-43% under the slowest warming scenario and 67-79% under the most rapid warming scenario by the end of the century.

Date: FRIDAY, APRIL 25, 2008

Time: 3:30p – 5:00p

Location: 200 C Ballard Extension Hall