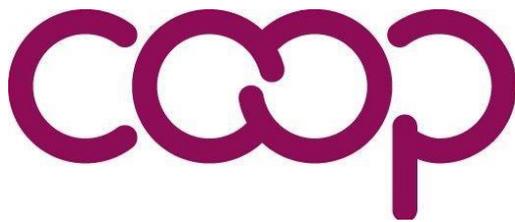


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ΙΝΣΤΙΤΟΥΤΟ ΕΥΝΕΤΑΙΡΙΑΤΙΚΩΝ ΕΡΕΥΝΩΝ

& ΜΕΛΕΤΩΝ (ΙΣΕΜ)

Title of abstract: Prediction of Corn Planting Dates

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Abstract : (max. 300 words)

Adjusting planting dates is an important human adaptation behavior in the agricultural industry in response to climate change. Since weather conditions suitable for corn growth vary in the corn-growing season, the prediction of the planting period, which determines the growing season, is critical to predicting future yield. This study offers a new prediction model for planting dates that is useful for aggregated data.

Using 18 states' weekly progress of planting report from the United States Department of Agriculture (USDA), I model each week's progress as a function of the week's and previous weeks' temperature and precipitation. From the multiple temperature range sets, I choose the cutoff temperatures (7 and 16°C) and the cutoff precipitation (5-13 mm) that best fit the data. This can be interpreted that more days with 7 to 16°C and 5 to 13mm of rain increase planting. Because the progress (percentage) has a lower and upper bound, I estimate the model using the Type I Tobit model.

An advantage of this model is that this applies to both small plots and aggregated fields such as state and country. While small plots finish planting within a day, a state in the U.S usually takes 4-5 weeks for planting. Unlike the Cui and Xie (2020) model that was applied on small plots, this model tracks the duration of planting, along with the starting date of planting by analyzing weekly progress.

Lastly, I used cross-validation analysis to improve prediction power. The approach allows me to choose the best model that fits out-of-sample data. The predicted result will be evaluated as well. I used data spanning 1981-2016 to estimate the model, and will predict planting dates for 2017-2020.

Keywords: climate change, corn, corn planting (max. 5)