Impacts of the Spatial Scale of Climate Scenarios on Cotton Production in the Southeastern USA. (A03-doherty142141-Oral)

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Abstract:

In this study, two climate scenarios were used to examine uncertainty associated with the spatial scale of climate on simulated cotton production in the SE USA. One scenario used results from a global climate model (GCM) with a resolution of ~5 degrees (coarse-scale) and the other used results from a regional climate model (RCM with a 50 km resolution (fine-scale). Yields were simulated using the GOSSYM cotton growth model for these two climate scenarios and for present-day climate under three cases: changes in climate alone, changes in climate and CO2, changes in both climate and CO2 and adaptation strategies to enhance production. Over the SE region, the RCM climate scenario produced lower yields than the GCM scenario for all three cases. Future climate changes alone, produced a decrease in yields compared to present-day for both climate scenarios. The yields simulated from the RCM scenario were about 10% lower than for the GCM scenario; the same result was found with higher CO2 levels. By allowing for adaptation strategies to climate change, in this case earlier planting, the differences between the yields simulated in the two scenarios were smallest, suggesting that for optimal conditions the differences in the scale of the climate scenarios was least important.

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Presentation Information:

Presentation Date: Thursday, November 14, 2002
Presentation Time: 9:00 am

Keywords:
climate change, cotton yields, spatial scale, adaptation