Climate Change, Crop Yields, and Farmer Perceptions

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Introduction

• Farmers are at ground zero for climate change
• They are vulnerable to its effects
  – Droughts, floods, cold, heat, hail
  – In 2012, $17.4 billion in crop insurance indemnities paid out
Key Question

• Are existing cropping systems becoming more or less sensitive to climate variations?
  – Active area of research
  – Answer to this question has important implications for climate change adaptation and mitigation in agriculture
Our study


• Use field level data on maize and soybean yields from 1995-2012 for Midwestern States
  – Linked to weather (drought) data
What we found

• Corn yields under drought conditions improved over time (in absolute value), but....
  – Yields have been rising more slowly in more severe drought stress conditions
What we found
What we found

• Main factor that drives “poor environmental conditions” for corn is Vapor Pressure Deficit (VPD)
What about soybeans?

• No strong link between soybean yields and VPD
What can happen in the future?
What may have caused this?

- Likely explanation – higher corn sowing densities over time
What do farmers think?


• Mail survey in 2009 – 1300 farmers in MS, NC, TX, WI
What do farmers think?

• They tend to be **climate change skeptics**
  – About 50% disagreed with the statement “I believe climate change has been scientifically proven.”
  – 20-30% said they have no opinion

• Consistent with other studies
  – Arbuckle et al. (2013) for Midwest farmers
  – 8% thinks climate change is human caused
  – 31% uncertain about climate change
What do farmers think?

- When asked about climate change impact on yields
  - 70% think that climate change will NOT affect average crop yields by more than 5%
  - 70% think that climate change will NOT affect crop yield variability by more than 5%
Concluding thoughts

• Evidence of adverse climate change effects on agriculture
  – Increased sensitivity to drought conditions

• But farmers are skeptical!

• Opportunity for creatively engaging farmers about this issue
  – Focus on economic benefits of mitigation practices
Thank you!

• Questions?

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“I’ve never seen the corn this bad.”