ECONOMICS OF USING REMOTE SENSING IN AGRICULTURE

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- **Problems**
  - Estimated loss: $20 bil. per year
    - Due to fertility, insect, disease, weeds & water problems

- **RS in Ag**
  - Detection of nutrient deficiencies
  - Soil water content
  - Crop damage due to insect
Problem

- RS has Great Potential but low Adoption rate
- Adoption of RS in Ag
  - 5% of all corn acres
  - 4% of all soybean acres (Daberkow et. al 2002)
  - 12% of US Ag retailers offered satellite RS images in 2003 (Whipker & Akridge, 2003)

Solution

- Crossing the Chasm
  - Digital cooperation (Scott Samson, MSU)
  - Profit maximization – farmers’ objective
- **Objective**
  - Summarize the economic benefit of RS in Ag

- **Materials and Methods**
  - Review of RS articles
    - Yield, input and/or monetary values
    - Journals, conference proceedings, websites, etc.
Results

- 12 Studies:
  - 11 aerial & 1 satellite imageries

- Commodities involved:
  - Wheat, corn, cotton, barley, soybean, beets

- Input Reduction
  - Nitrogen: 10 – 60%
  - Insecticide/herbicide/fungicide: 30%

- Yield change
  - Nitrogen: -8.7 – 10%
  - Insecticide: 18%
Profitability

- $10 to $40 per ha

Conclusion

- Results show RS has the potential to increase Ag profits
- Only 12% studies reported some economic information

Appeal to Researchers

- Input & output quantities and prices
- Imagery acquisition cost
- VRA and other SSM related costs