Value of On-Farm Testing for Variety Selection

Darrin M. Dodds

Christopher L. Main

L. Thomas Barber

MISSISSIPPI STATE UNIVERSITY
EXTENSION SERVICE

UT Extension

UofA UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE
Cooperative Extension Service

Variety Testing

- **We are lucky**
  - **Mississippi State University OVT program:**
    - **Cotton – 49 entries; 7 locations; 2 separate tests**
    - **Soybean – 273 entries; 8 locations; 6 separate tests**
    - **Corn – 100 entries; 3 locations; 2 separate tests**
      - **Illinois: 328 entries from 43 companies; 12 locations**
- **Goal: Provide unbiased comparisons of diverse cotton varieties**
- **Variety testing data also used by researchers to evaluate changes and trends**

Bourland et al. 2000

Types of Variety Trials

- **Replicated small plot – OVT**
  - **2 – 4 rows wide**
  - **25 – 50 foot long rows**
- **Replicated large plot**
  - **# rows depends on picker setup**
  - **Length – depends on field layout**
- **Strip trials**
  - **Replicated large plot minus replication**
- **Module sized plots**

Bias Associated with Variety Testing

- **Consistency of plant stand**
  - **Depends on testing method**
- **Advantages/disadvantages due to maturity:**
  - **Termination of insecticide sprays**
  - **Irrigation timing**
  - **Growth management**
- **Sampling method**
  - **Hand picked samples vs. grab samples**

Bourland 2000

Small Plots vs. Replicated Large Plots

- Each type of test has strengths and weaknesses
- Small plot OVT – allows for investigation of a large number of varieties
  - Also allows for examination of multiple technologies with same experiment
  - Greater control over all aspects of production
- Large plot on farm testing
  - Effect of multiple management strategies
  - Visibility
  - Replication is important
  - Plot size should be considered (Stewart 2006)

Large Plot Variety Testing - Issues

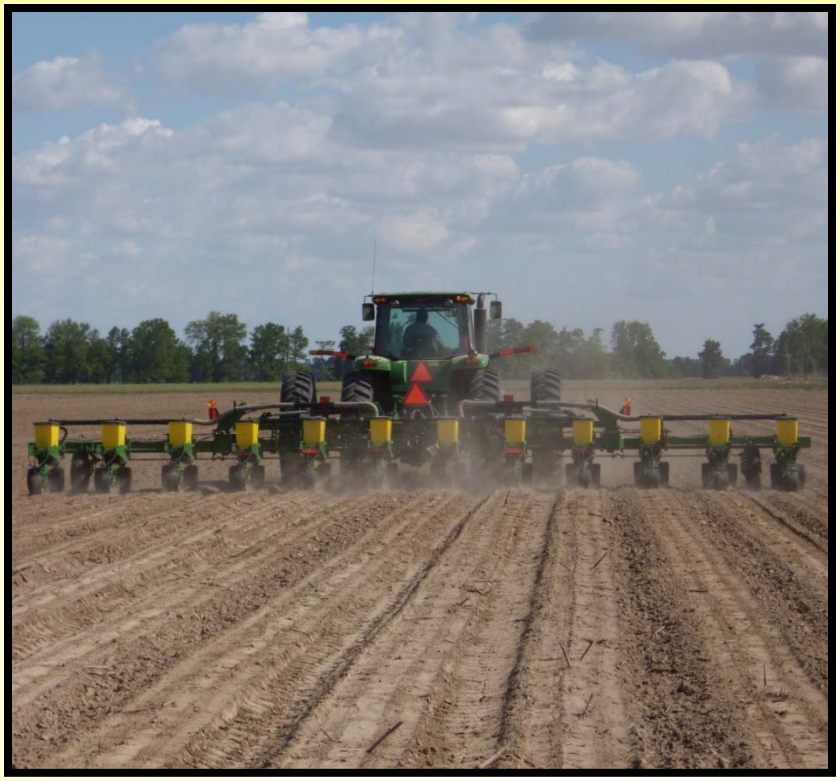
- Fields do not have uniform soil type and texture
- Fertility
- Drainage
- Topography
- Edge effects

Bridging The Gap

- **Small plot OVT's criticized for not representing field scale data**
- **OVT programs designed to determine genetic potential of varieties entered**
- **Large plot on farm variety trials designed to bridge gap between OVT programs and on-farm performance**

Random Thoughts

- **Large plot tests not designed to replace or compete with OVT tests**
- **No dataset is perfect**
- **Knowledge is power**



Considerations When Examining Data

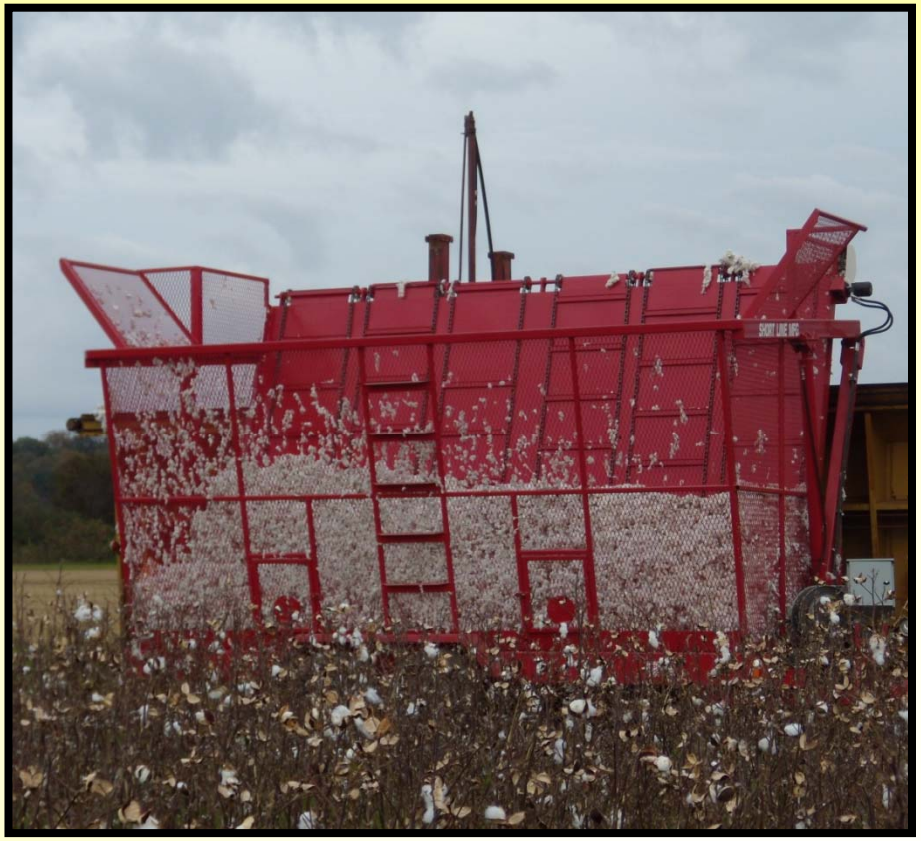
- **Use multiple data sources when making variety decisions**
  - **More data = better decisions**
- **Should yield be the only selection criteria?**
  - **Absolute vs. relative yields**
- **Yield *potential***
  - **Possible, as opposed to actual yield**
  - **Easy to determine from testing results**
  - **Pick best yielding varieties**
- **Yield *stability***
  - **Continuance without change; permanence**
  - **Difficult at best to determine, multiple factors with environmental interaction**
  - **Pick varieties that perform best over time and environments**

Further Considerations

- Examine rankings in a given trial not just yield number
- What about fiber quality?
- Reported loan values should be taken with a grain of salt
  - Less than optimum defoliation and harvest timing
  - Sampling method
  - Ginning
  - Color and leaf grade (Stewart 2006)

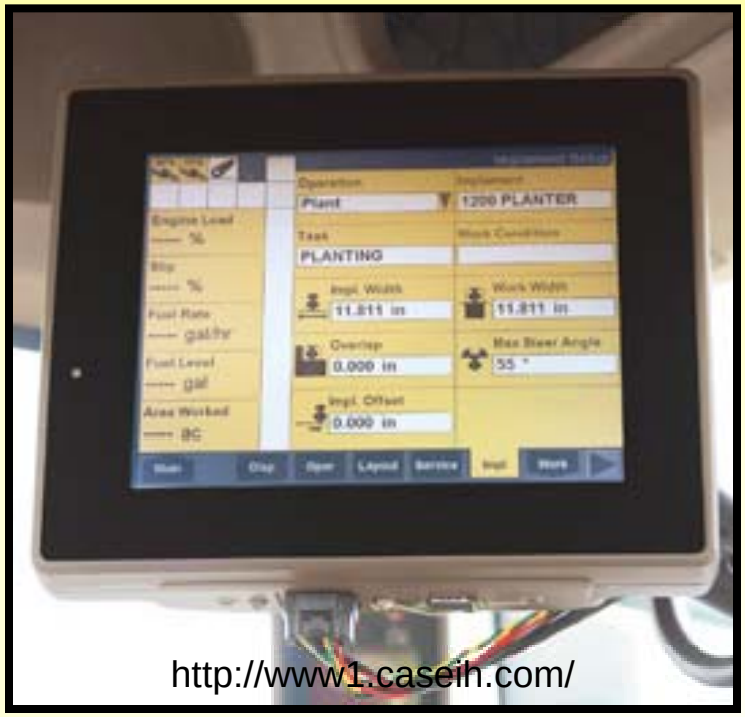
Current Challenges

- Identifying cooperators
- Varieties to include
  - Technology
  - Release rate
- Logistics
  - Planting
  - Positioning of equipment
- Data collection
- Timely release of data



Future Challenges – Yield Monitors

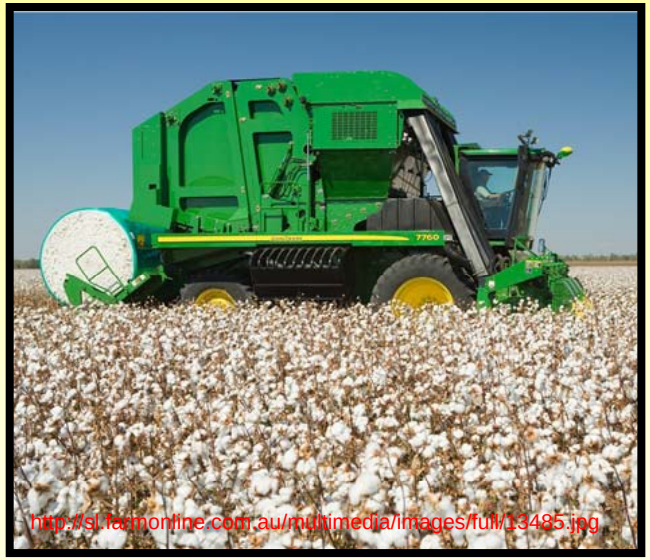
- **Yield monitors have been shown to underestimate true yields**
  - **Degree depended on variety (Stewart et al. 2008)**
- **Use of yield monitors for variety trials with multiple varieties is not recommended (Robertson et al. 2006)**



http://www1.caseih.com/

Future Challenges – Pickers

- **Module building pickers**
  - **Not a significant issue – Yet**
  - **Present challenges for data collection**
  - **Added expense**
- **What is the solution?**
  - **Yield monitor?**
  - **More plots?**
  - **Larger plots?**



Value of On-Farm Variety Testing

- **On-farm variety testing benefits everyone:**
  - **Grower – 1st hand knowledge of how a variety performs on their farm**
  - **Consultant – Experience with management effects on multiple varieties**
  - **Private industry – Data**
    – Product exposure
  - **University personnel – Knowledge of variety performance**
    – Interaction with associated parties

Questions