

# Value of On-Farm Testing for Variety Selection

---

Darrin M. Dodds

Christopher L. Main

L. Thomas Barber



**MISSISSIPPI STATE**  
UNIVERSITY<sup>™</sup>  
**EXTENSION SERVICE**



**UF** | **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**

# 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

# 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)



# 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 – 1<sup>st</sup> 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

