Value of On-Farm Testing for Variety Selection

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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 the 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

  - 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 – 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