COTTON FIBER TESTING
AND
CSITC ROUND TRIAL

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Points of Consideration:

■ Why should you own an instrument, if you don’t already?
■ Why is a round trial important, if you have an instrument and you do not participate?
■ Are you taking full advantage of round trial data, if you own an instrument and participate in round trial?
Cost drivers
Focus on where you have control

Breakdown of Yarn Cost/Pricing

- Raw Material Cost
- Conversion Cost
- Profit

Opportunity

- Optimized cotton purchasing & management
- Efficient use of material, labor, machines
- Optimized quality

**USTER**
Think Quality
Comparing the world
Gain control over your cost

Ring Yarn Total Cost

USA
Turkey
India
China

0% 20% 40% 60% 80% 100%

% of Total Cost


Source: ITMF International Production Cost Comparison

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Cotton fiber properties
Each spinning system has a priority

<table>
<thead>
<tr>
<th>Fiber Properties Which Influence Yarn Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ring</strong></td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Length Uniformity</td>
</tr>
<tr>
<td>Strength</td>
</tr>
<tr>
<td>Fineness</td>
</tr>
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<td></td>
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</tbody>
</table>
## Raw Material

### Impact of Fiber Properties

<table>
<thead>
<tr>
<th>HVI Fiber Property</th>
<th>Processing Characteristics Affected</th>
</tr>
</thead>
</table>
| Strength                 | >Yarn and Fabric Strength  
                          >End Breaks in Spinning and Weaving                                    |
| Length                   | >Yarn and Fabric Fineness  
                          >Yarn and Fabric Strength  
                          >Nep Formation During Processing  
                          >Formation of Pilling  
                          >Yarn Evenness  
                          >Yarn Imperfections                                                   |
| Length Uniformity/Short Fiber | >Processing Waste  
                          >End Breaks in Spinning  
                          >Yarn Evenness  
                          >Yarn Imperfections                                                   |
| Micronaire/Maturity       | >Nep Formation During Processing  
                          >White Specks/Shiny Neps  
                          >Yarn & Fabric Strength  
                          >Product Appearance  
                          >Processing Waste  
                          >End Breaks in Spinning                                               |
| Trash Content            | >Processing Waste  
                          >Textile Machinery Contamination/Component wear  
                          >Disturbances/Stops in Knitting  
                          >Product Appearance  
                          >Cotton Dust Levels                                                   |
| Color                    | >Fabric Appearance (Barré)                                              |
| Neps                     | >Fabric Neppiness  
                          >Waste  
                          >Weaving Efficiency                                                   |
| U.V. Fluorescence        | >Fabric Appearance (Barré)                                              |

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The problem

High raw material cost

• High raw material cost is the main cost in yarn manufacturing causing…
  – Low profitability
• The source of high raw material cost are many include…
  – Buying higher quality fiber than necessary to make up for lack of optimized processes
  – Lack of complete cotton quality data to make informed buying/pricing decisions
  – Poor mix/laydown management resulting in high variability in product quality and processing efficiency
The problem
Thick and thin place defects in yarn

- Thick and thin places in yarn is one of the top quality pains for mills causing...
  - Off-quality yarn
  - Waste
  - Low profitability
- The source of thick and thin places in yarn are many and include...
  - High short fiber in raw material
  - High fiber micronaire in raw material
  - Poor management of cotton laydowns resulting in high variation within and between laydowns
The problem
High end breaks in spinning and weaving

• High yarn end breaks in spinning and weaving is one of the top quality pains for mills causing...
  – Off-quality yarn
  – Waste
  – Low profitability

• The source of high yarn end breaks in spinning and weaving are many and include...
  – High short fiber content in raw material
  – High trash content in raw material
  – High micronaire variation in raw material
  – Low fiber strength in raw material
  – Poor management of cotton laydowns resulting in high variation within and between laydowns
The problem
Dyeing defects in fabric

- Dyeing defects in fabric is one of the top quality pains for mills causing...
  - Off-quality yarn
  - Waste
  - Low profitability
- The source of dyeing defects in fabric are many and include...
  - Low maturity in raw material
  - Variation in maturity in raw material
  - Variation in cotton color
  - Variation in U.V. fluorescence
  - Poor management of cotton laydowns resulting in high variation within and between laydowns
The problem
Nep defects in yarn

• Neps in yarn is one of the top quality pains for mills causing…
  – Off-quality yarn
  – Waste
  – Low profitability

• The source of nepes in yarn are many and include…
  – High nep level in raw material
Case study
Reducing quality variability = $110,395 savings/year
Value of CSITC Data

- Feedback data from round trials is a reference point for the instrument’s performance.
- Comparison of instrument’s performance to other participants’ in the trial is important, especially if the cotton is traded instrument measurements.
- Detection of a problem on accuracy of your instrument before it impacts your operation can translates to savings.
Value of CSITC Data

- Fiber testing instrument does not have to encounter obvious hardware/software malfunctions to produce wrong data
- In general, instruments are relatively smart using built-in thresholds and limits for various measurements
- They can detect a large number of failures and inform the operator
- To a great extent they compensate for changes in hardware thru software calibrations

However...
Value of CSITC data

There are circumstances that instrument can be “fooled” in producing wrong data.

Examples are:
- “Bad” calibration cottons, i.e. poor texture due to over use
- Scratches on color window
- Uncleaned color calibration tiles
- Drift in laboratory ambient conditions
- Brush and breaker jaws wear
- Changes in air flow can affect pneumatically driven components
Value of CSITC Data

Example of an effective round trial:

- USDA’s internal “check test program "is a form of round trial, which has enabled them to insure the performance of over 200 HVIs with tight measurement tolerances
Value of CSITC Data

■ Important:

*Instrument data can be precise but not necessarily accurate!*
Value of CSITC Data

What can future hold?

- With increase in number of participants and support from instrument manufacturers feedback can be extended but not limited to:
  - alert manufacturer of potential problems
  - Online support and hotlines possibilities
Questions or Comments?

Thank you!