Current Advances in Cotton Processing and its Impact on Quality

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Advances in Textile Technologies
ICAC 81st Plenary Meeting
Yarn Manufacturing Considerations

- Raw Material
- Production
  - Power
  - Waste
  - Labour
  - Maintenance
  - Other
    - capability of pant
    - technical expertise
    - automation
    - higher production speeds
    - ascertain variability
    - process control
    - research and development
    - training
    - achieving price points
Raw Material Issues

• Price
  ✓ fibre accounts for ≥ 70% of yarn manufacturing costs.
• Fibre quality must be accurately known to guarantee yarn quality.
  ✓ imported cotton
  ✓ using fibre from long-time storage
  ✓ avoid fibre undesirable for producing required end-use
• Availability of supply and Reliability of supplier.
  ✓ consistent lay downs based on fibre quality is essential for efficient mill operation.
• More emphasis on blending and mixing.
  ✓ control nep count, ends down, noil, waste, yarn and fabric quality and processing performance
• Adjust technical specifications.
  ✓ spinning system, TPI, noil % etc.)
• It’s a short staple plant - can easily switch production to MMF.
## Important Fibre Properties

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Ring</th>
<th>Rotor</th>
<th>Air - jet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Length</td>
<td>Strength</td>
<td>Length</td>
</tr>
<tr>
<td>2</td>
<td>Strength</td>
<td>Micronaire</td>
<td>Trash</td>
</tr>
<tr>
<td>3</td>
<td>Micronaire</td>
<td>Length</td>
<td>Micronaire</td>
</tr>
<tr>
<td>4</td>
<td>Trash</td>
<td>Trash</td>
<td>Strength</td>
</tr>
<tr>
<td>?</td>
<td>Other</td>
<td>Other</td>
<td>Other</td>
</tr>
</tbody>
</table>

### Contribution to Price

```
30 23 22 20 5
```

- Colour
- Trash
- Micronaire
- Length
- Strength
## Requirements for Commodity and Fine Count Yarns

<table>
<thead>
<tr>
<th>Fibre Property</th>
<th>Upland</th>
<th>Long Staple Upland</th>
<th>Extra Long Staple</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staple Length (UHML)</strong></td>
<td>&gt; 1.13 inch; 28.7 mm (1.1/8 inch; 36/32nds)</td>
<td>&gt; 1.24 inch; 32 mm (1.1/4 inch; 40/32nds)</td>
<td>&gt; 1.36 inch; 34 mm (1.7/16 inch; 46/32nds)</td>
</tr>
<tr>
<td><strong>Length Uniformity</strong></td>
<td>&gt; 81</td>
<td>&gt; 83</td>
<td>&gt; 85</td>
</tr>
<tr>
<td><strong>Short Fibre Index (%)</strong></td>
<td>≤ 9.0</td>
<td>≤ 7.0</td>
<td>≤ 4.0</td>
</tr>
<tr>
<td><strong>Strength (grams per tex)</strong></td>
<td>&gt; 29</td>
<td>&gt; 33</td>
<td>&gt; 38</td>
</tr>
<tr>
<td><strong>Micronaire</strong></td>
<td>3.8 - 4.6</td>
<td>3.7 - 4.2</td>
<td>3.5 - 4.1</td>
</tr>
<tr>
<td><strong>Maturity Ratio</strong></td>
<td>&gt; 0.85</td>
<td>&gt; 0.85</td>
<td>&gt; 0.85</td>
</tr>
<tr>
<td><strong>Fineness (mtex)</strong></td>
<td>160 - 180</td>
<td>160 - 180</td>
<td>140 - 160</td>
</tr>
<tr>
<td><strong>Neps (neps/gram)</strong></td>
<td>&lt; 250</td>
<td>&lt; 200</td>
<td>&lt; 180</td>
</tr>
<tr>
<td><strong>Trash</strong></td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Grade</strong></td>
<td>Not Grade but rather Rd &amp; +b</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• The quality of ginned cotton is directly related to the quality of seed cotton prior to ginning
• What about lint turn out %?
A Final Word

• There is essentially no high or low quality cotton but rather only good quality which meets requirements in terms of price, performance, characteristics and the intended use.

• Obtain accurate and reliable information of the cotton you intend or have already purchased (HVI, CSITC, ICA-Bremen, etc.)

• Colour Grade should be replaced with Rd & +b

• Improved education, training, learnings

• Implement Bale Management System

• Maintain strict testing regimes and retain records

• Understand the capability of your mill and make purchase and technical decisions accordingly

• Consider Custom Ginning
Thank you

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Disclaimer: Please note that the comments and observations are my personal opinions and do not necessarily reflect the industries I operate in.