# Australian cotton fibre quality

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February-March 2017

**CSIRO MANUFACTURING and CSIRO AGRICULTURE**
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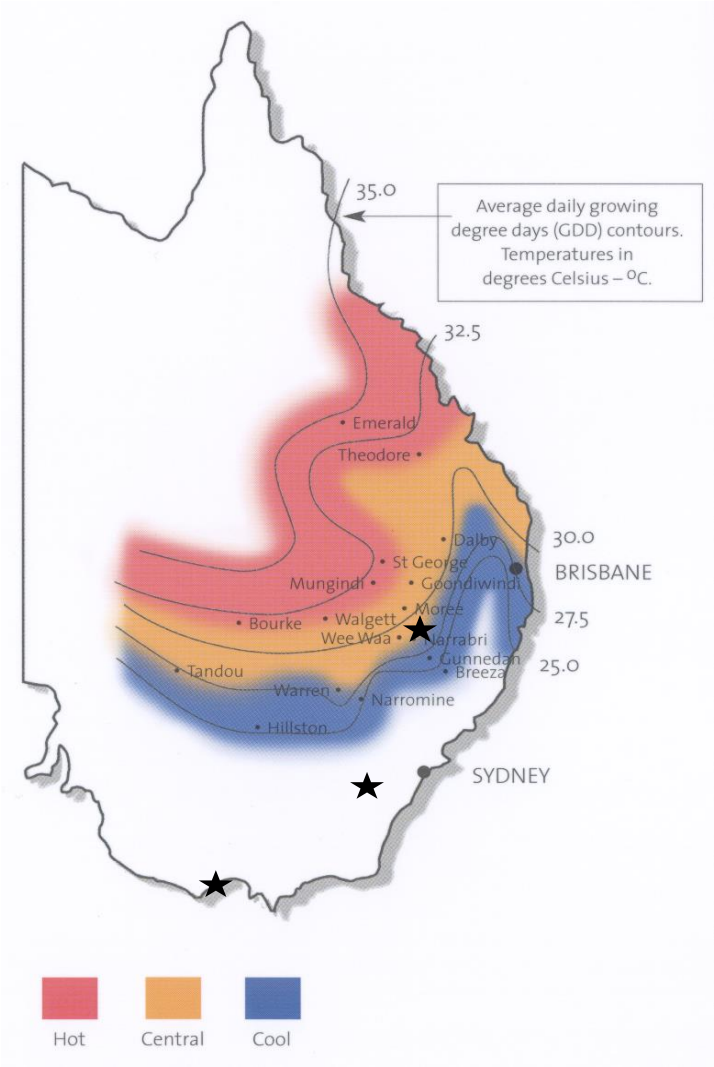
# Outline

- CSIRO cotton program
- Fibre quality
- Spinning ability
- Dye quality

# CSIRO cotton research program




**Broad range of research areas:**

- Breeding (Narrabri)
- Agronomy (Narrabri)
- Biotechnology (Canberra)
- Post-harvest (Geelong)

Strong emphasis on fibre quality

All locations are well coordinated

# CSIRO cotton research aims and tools

Fibre quality and productivity improvement

- Long-standing regime to select best cultivars
- Field trials, HVI and genetic testing
- Procedures and tools to assess spinning ability and fibre attributes not measured by HVI, e.g. fineness and maturity
- Best management practices (BMP) in production, harvest, ginning and classing

# Fibre quality

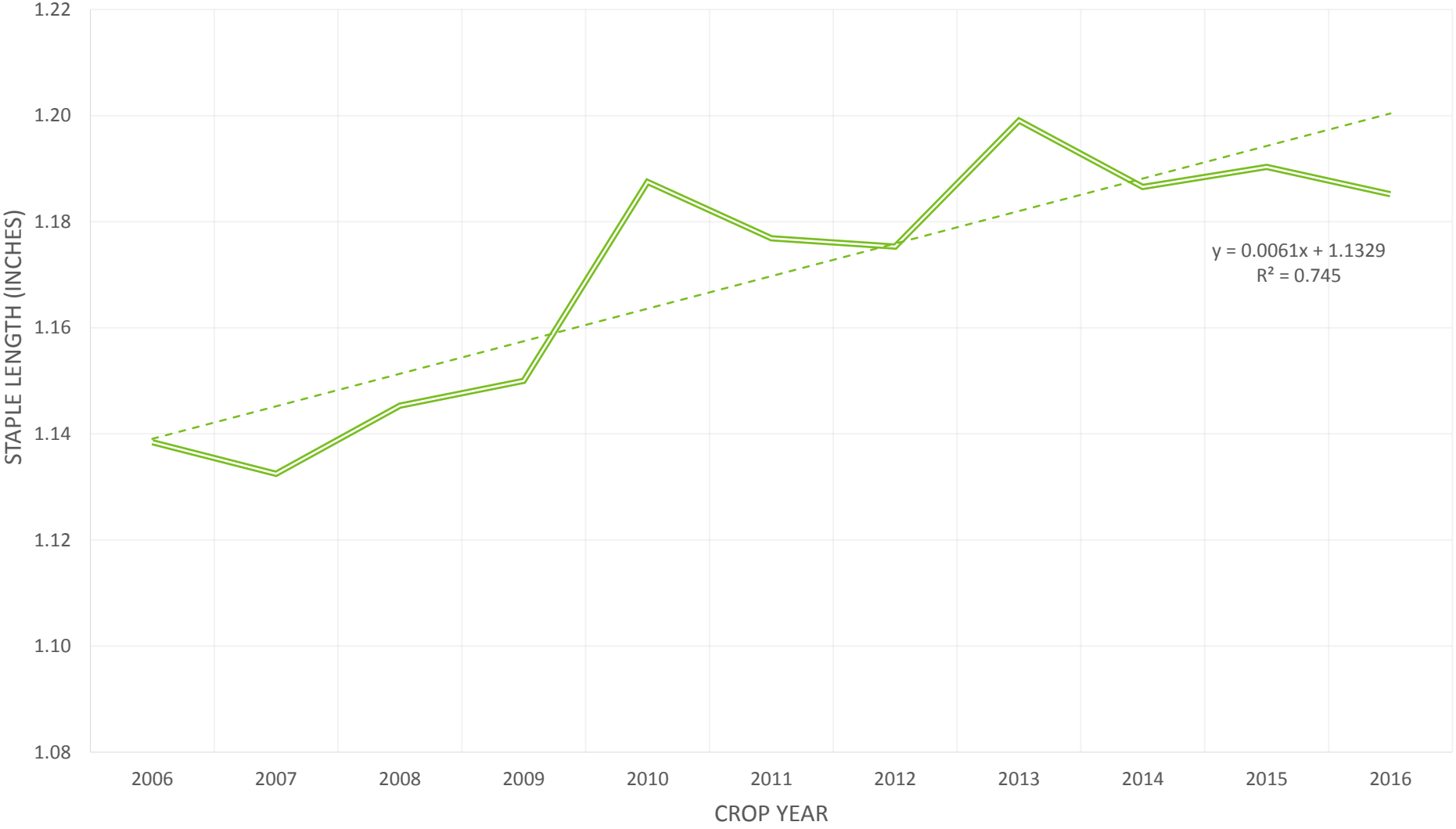
**Average CSIRO variety trials results (irrigated, dryland and semi-irrigated) last six years (Sicot 74BRF) plus new varieties in 2016/17**

| Prop. | LEN | MIC | UNI | STR | SFI | ELO |
|---|---|---|---|---|---|---|
| AV. 6 years | 1.21 | 4.3 | 81.6 | 31.3 | <10 | >6 |
| Sicot 746B3F | 1.21 | 3.9 - 4.7 | >81 | >30 | <10 | >6 |
| Sicot 748B3F | 1.24 | 3.9 - 4.7 | >81 | >31 | <10 | >6 |
| Sicot 754B3F | 1.25 | 3.9 - 4.6 | >82 | >31 | <10 | >6 |

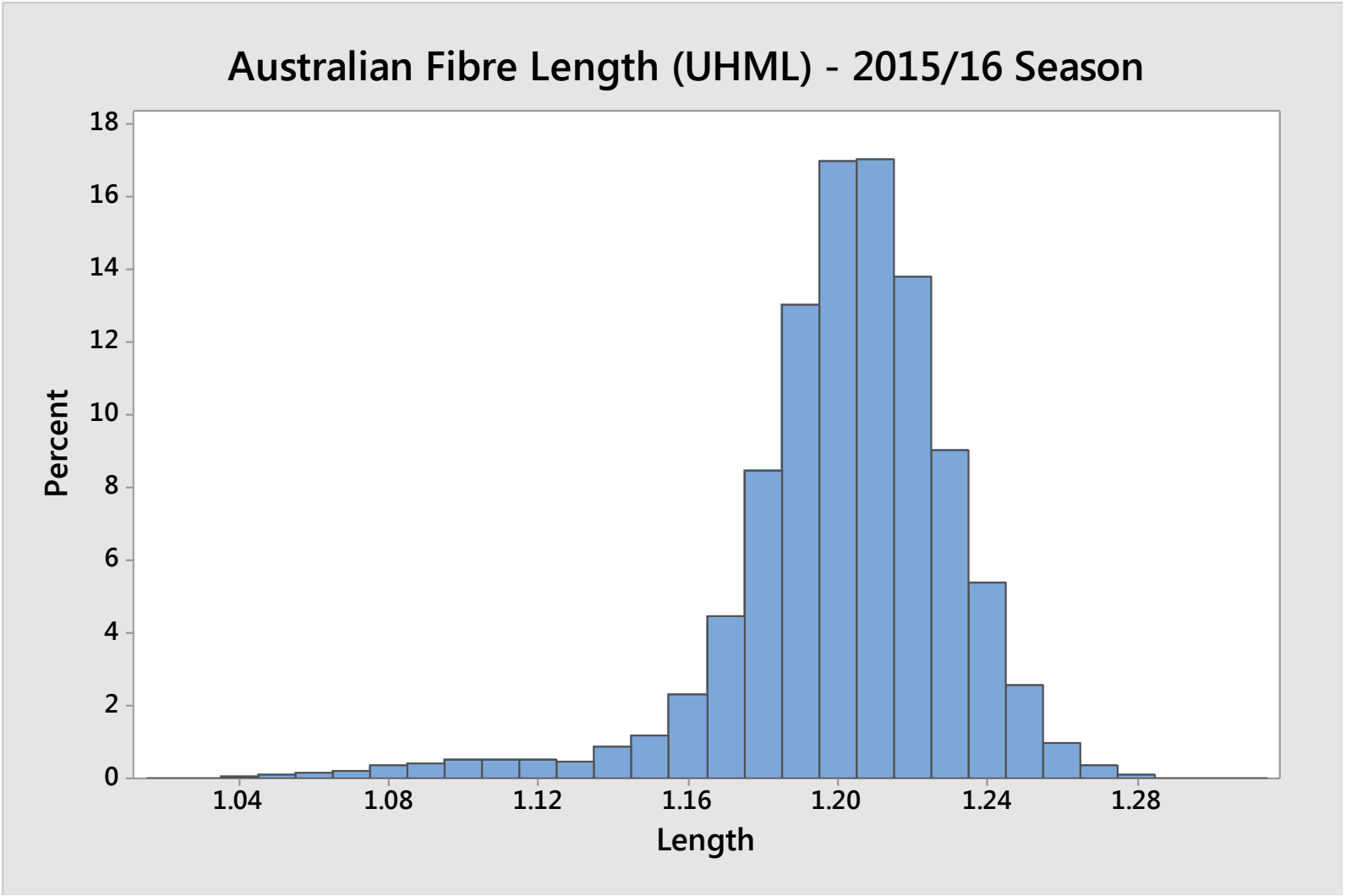
# Realized Fibre quality

- Length significantly improved since 2006
- Focus on improved spinning and dyeing ability

# AUSTRALIAN STAPLE LENGTH 2006 - 2016



# Spinning ability - sample from 2015/16



# Spinning ability

| Length group | Percent of crop | *Average properties of each length group* | | | | |
|---|---|---|---|---|---|---|
| | | LEN | MIC | TEN | UNI | SFI |
| AUSTRALIA – 2015/16 | 100 | 1.21 | 4.39 | 31.6 | 82.1 | 9.0 |
| AUSTRALIA (1.25 – 1.31) | 4 | 1.28 | 4.22 | 32.9 | 83.3 | 6.5 |
| AUSTRALIA (1.19 – 1.25) | 75 | 1.22 | 4.39 | 31.7 | 82.3 | 8.8 |
| AUSTRALIA (1.13 – 1.19) | 18 | 1.16 | 4.32 | 30.2 | 80.9 | 10.4 |
| AUSTRALIA (1.06 – 1.13) | 3 | 1.10 | 4.20 | 28.5 | 79.6 | 12.0 |

# Spinning ability - Cottonspec

| Length group | Yarn count (Ne) | Cottonspec Tenacity cN/tex | Uster Statistics Rank | Cottonspec Yarn CV % | Uster Statistics Rank |
|---|---|---|---|---|---|
| AUSTRALIA | 40 | 23.0 | 5 | 10.0 | 5 |
| | 50 | 22.1 | 45 | 11.4 | 5 |
| | 60 | 21.5 | 49 | 12.4 | 5 |
| AUS. (1.25 – 1.31) | 40 | 24.5 | 5 | 9.3 | 5 |
| | 50 | 23.5 | 35 | 10.7 | 5 |
| | 60 | 22.9 | 38 | 11.7 | 5 |
| AUS. (1.19 – 1.24) | 40 | 23.2 | 5 | 9.9 | 5 |
| | 50 | 22.2 | 44 | 11.4 | 5 |
| AUS. (1.13 – 1.18) | 40 | 22.1 | 5 | 10.3 | 5 |
| | 50 | 21.1 | 53 | 11.7 | 5 |

# Dyeing ability – Cottonscope

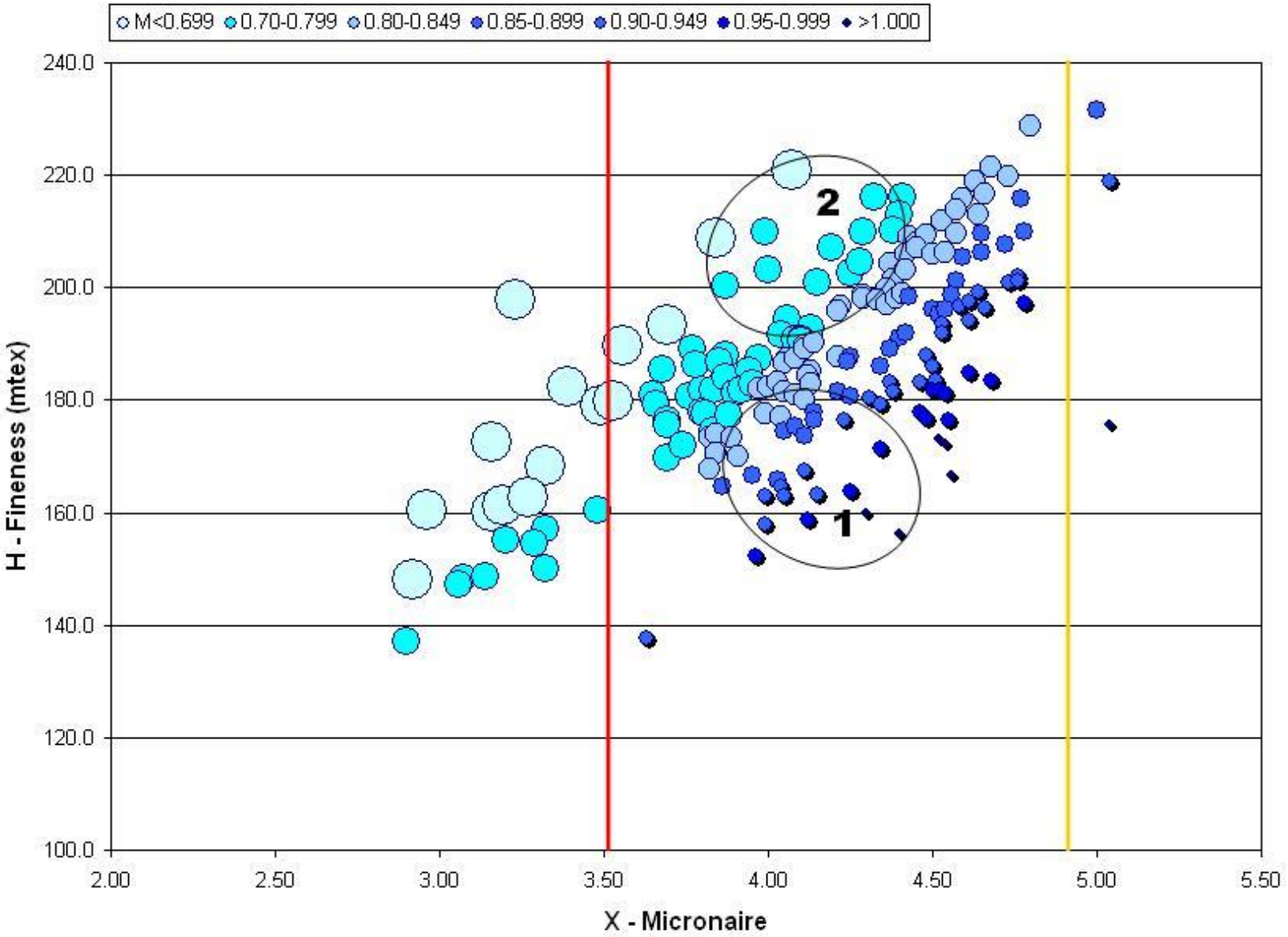
Fast (< 30 secs), accurate and direct method for measuring the fibre fineness, maturity and ribbon width of cotton.

Small specimen; no need for conditioning samples for maturity or ribbon width.

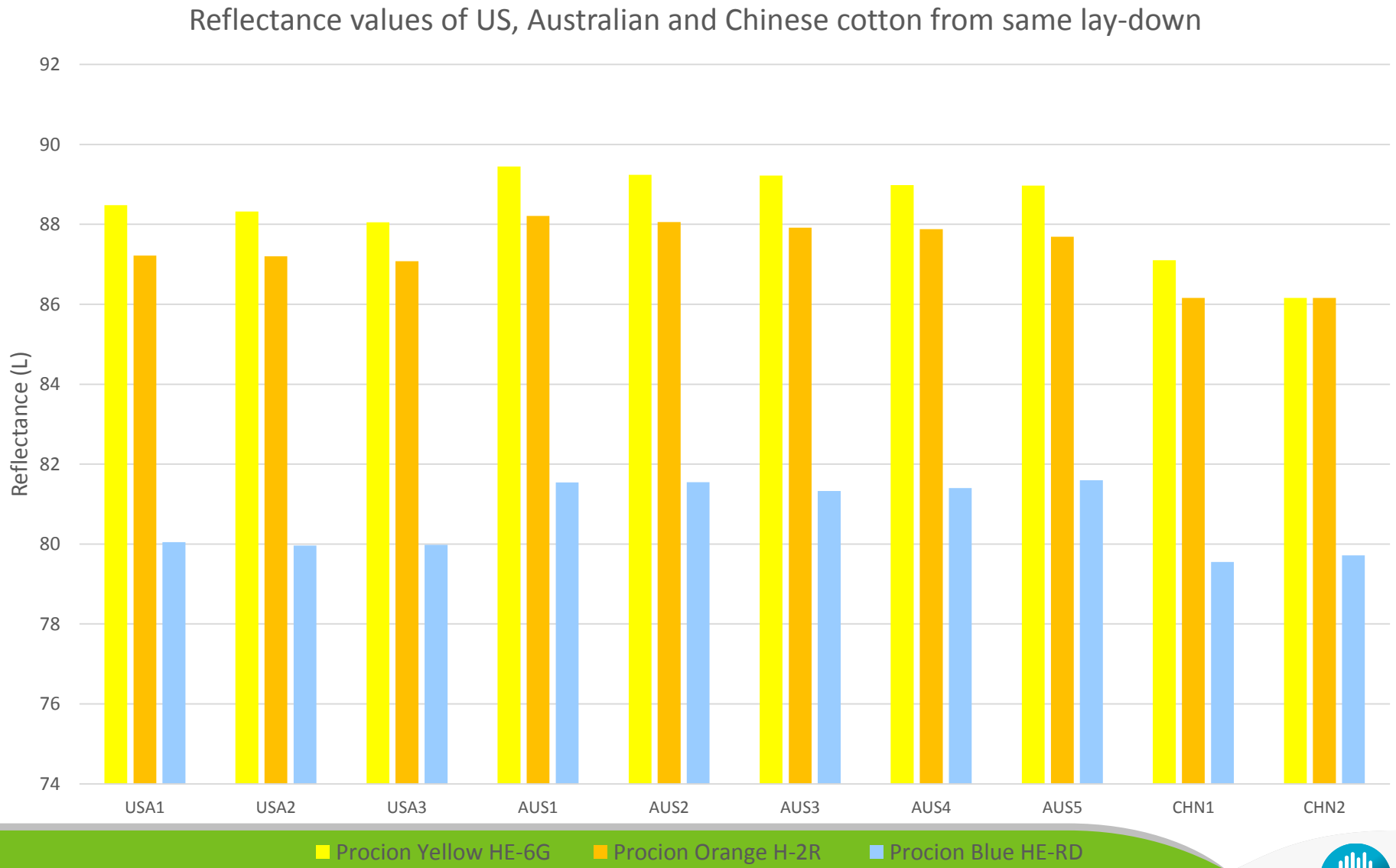
Gives distribution of maturity and ribbon width values.

Calculates Micronaire value.

Calibrated using 104 international reference cottons produced by TTU.


M<0.699
0.70-0.799
0.80-0.849
0.85-0.899
0.90-0.949
0.95-0.999
>1.000
240.0
220.0
200.0
180.0
160.0
140.0
120.0
100.0
H - Fineness (mtex)
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
X - Micronaire
1
2

# Dyeing trials – CSIRO



# Conclusion

- Strong focus on fibre quality
- Top 5%-50% of Uster Statistics
- Dyes brightly (higher Rd values)

Excellent fibre length and consistent quality makes Australian cotton an inexpensive growth to improve yarn quality.

# Thank you

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