# The Effects of Poor Scouring Practice

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# Compromises involved in Wool Scouring

- cleanliness vs entanglement
- cleanliness vs fibre damage
- Cleanliness vs environment

# Effect of Scouring on Subsequent Processing

- Residual contaminants
- Fibre entanglement
- Fibre damage
- Moisture levels

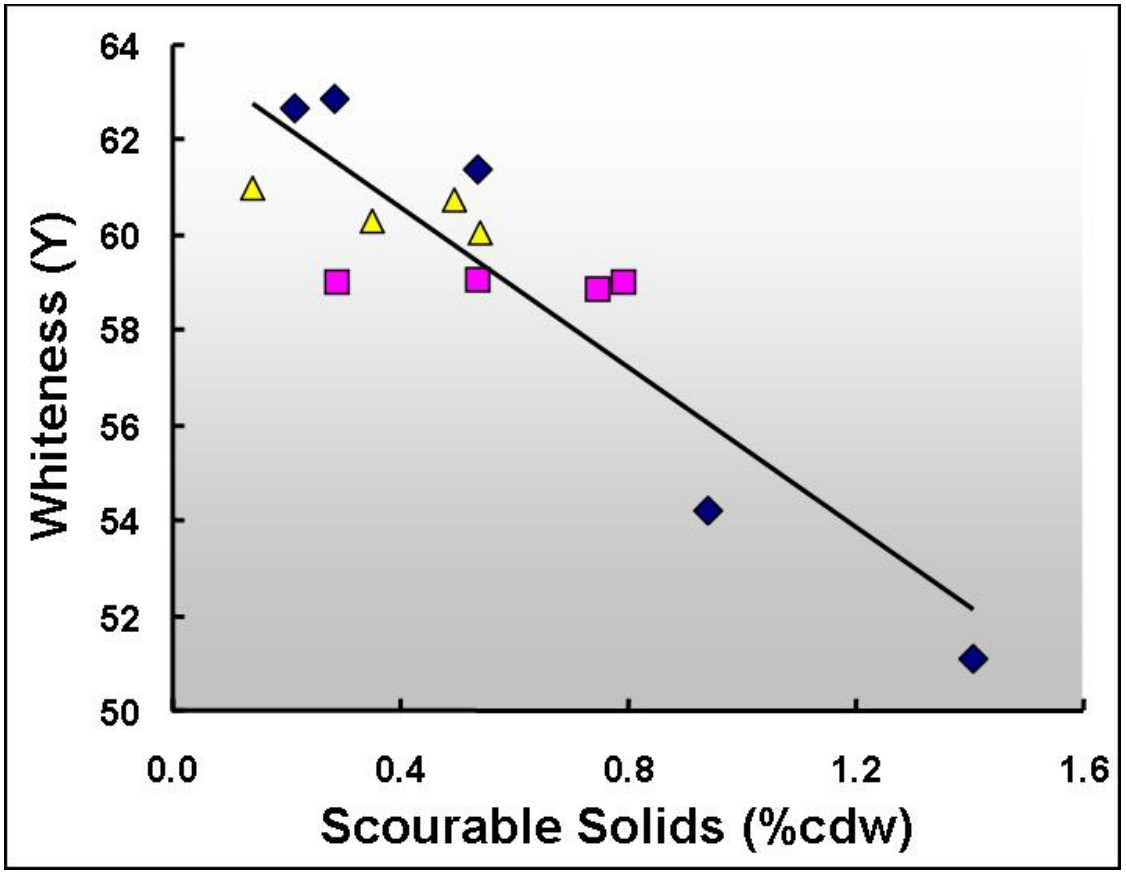
# Comparative Processing Trials

- Commercial Wool Scours
  - IWS/CSIRO – 5 scours/two wools
  - ACIAR/CSIRO – 12 scours/ two series/two wools
  - ANDAR/CSIRO – 1 scour/ three configurations
- CSIRO Pilot Scour

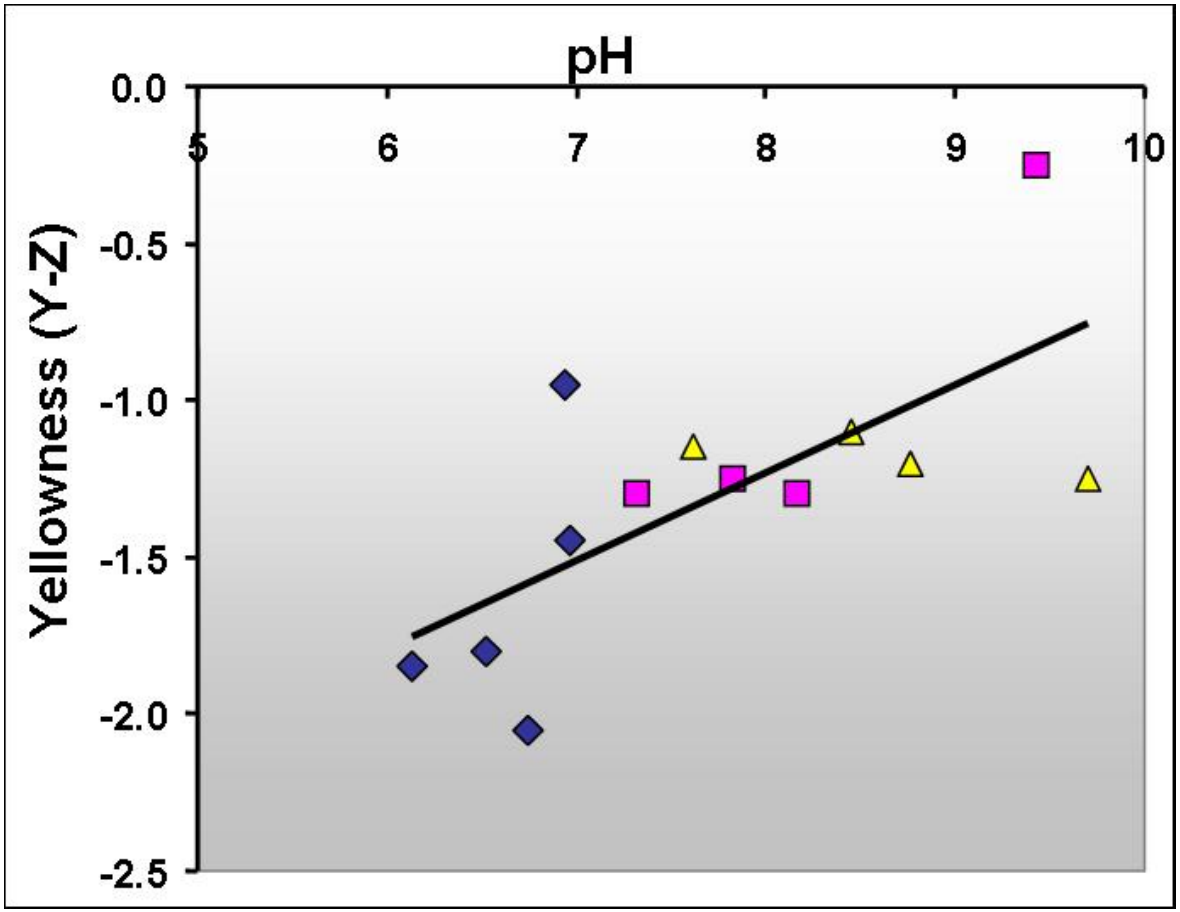
# Effect on Scoured Wool Properties

- Residual Contaminants
- Colour

# Effect of Dirt on Colour



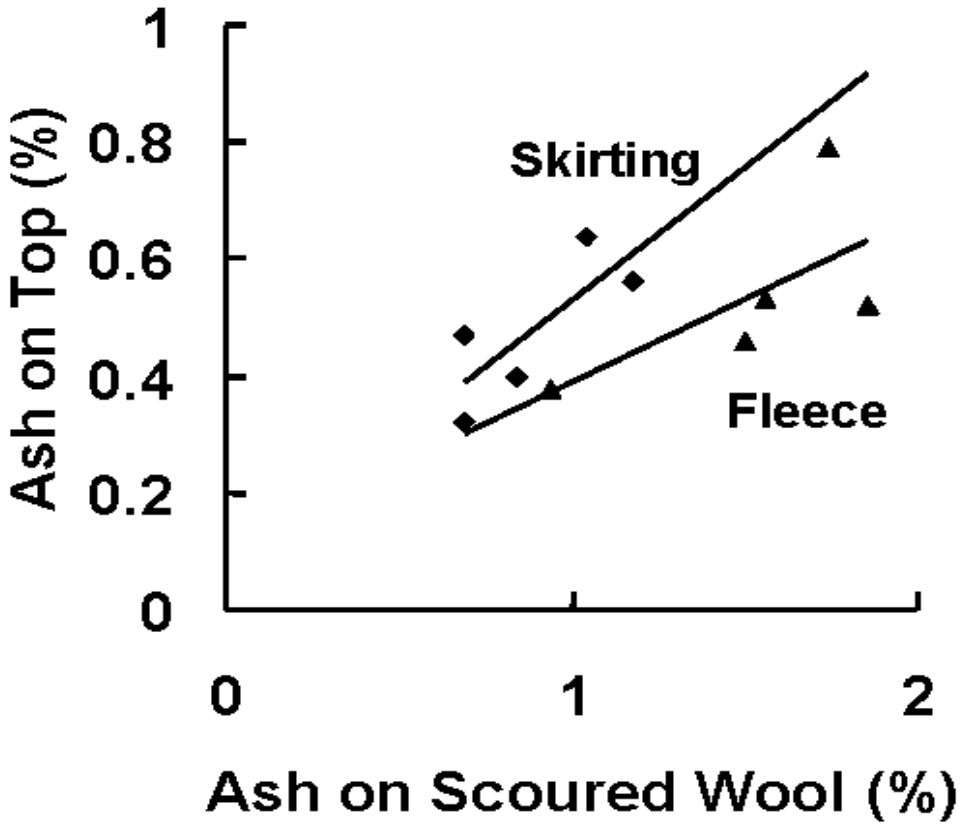
# Effect of pH on Yellowness



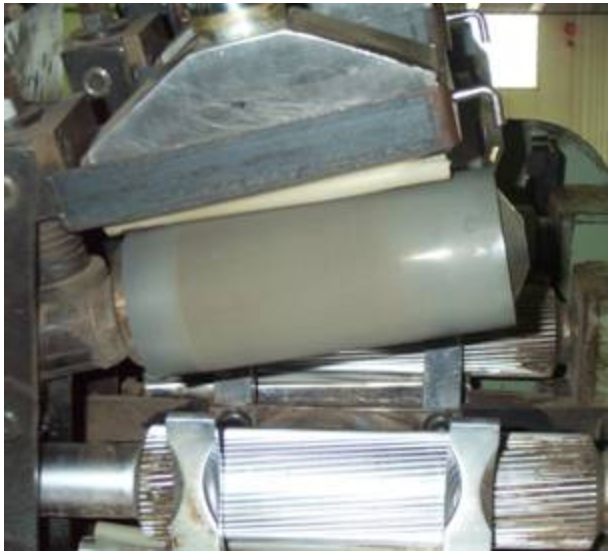
# Effect of Residual Contaminants

- Accumulation
  - reduced processing performance
  - maintenance issues
- Processing additives
  - loss in wastes
  - change in properties
- Dust
  - Health issues
  - Yield

# Relationship between Ash Content of Scoured Wool and Top



# Effect of Contaminants on Topmaking



# Effect of Fibre Entanglement

Fibre Breakage in Carding

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Increase in Noil (Romaine)

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Shorter Top

↓

Poor Spinning Performance

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Economic Loss

# Causes of Entanglement

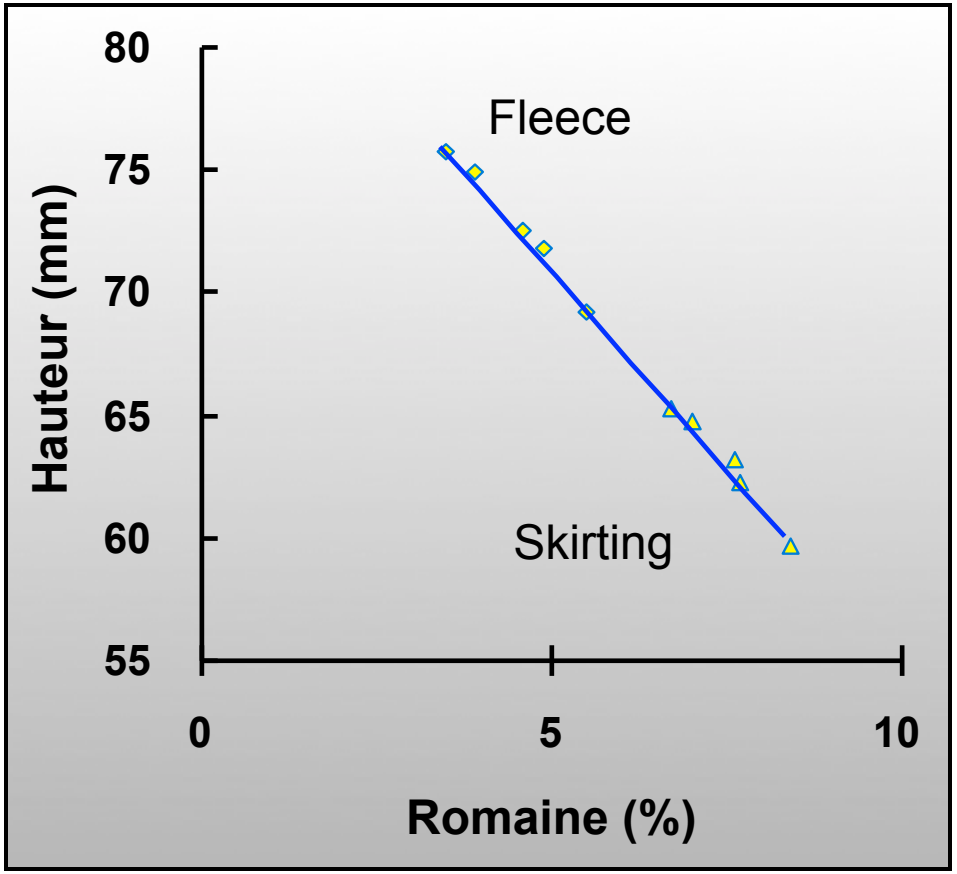
- Opening
- Mechanical
- Scouring Conditions
- Drying Conditions

# Effect of Opening on Entanglement

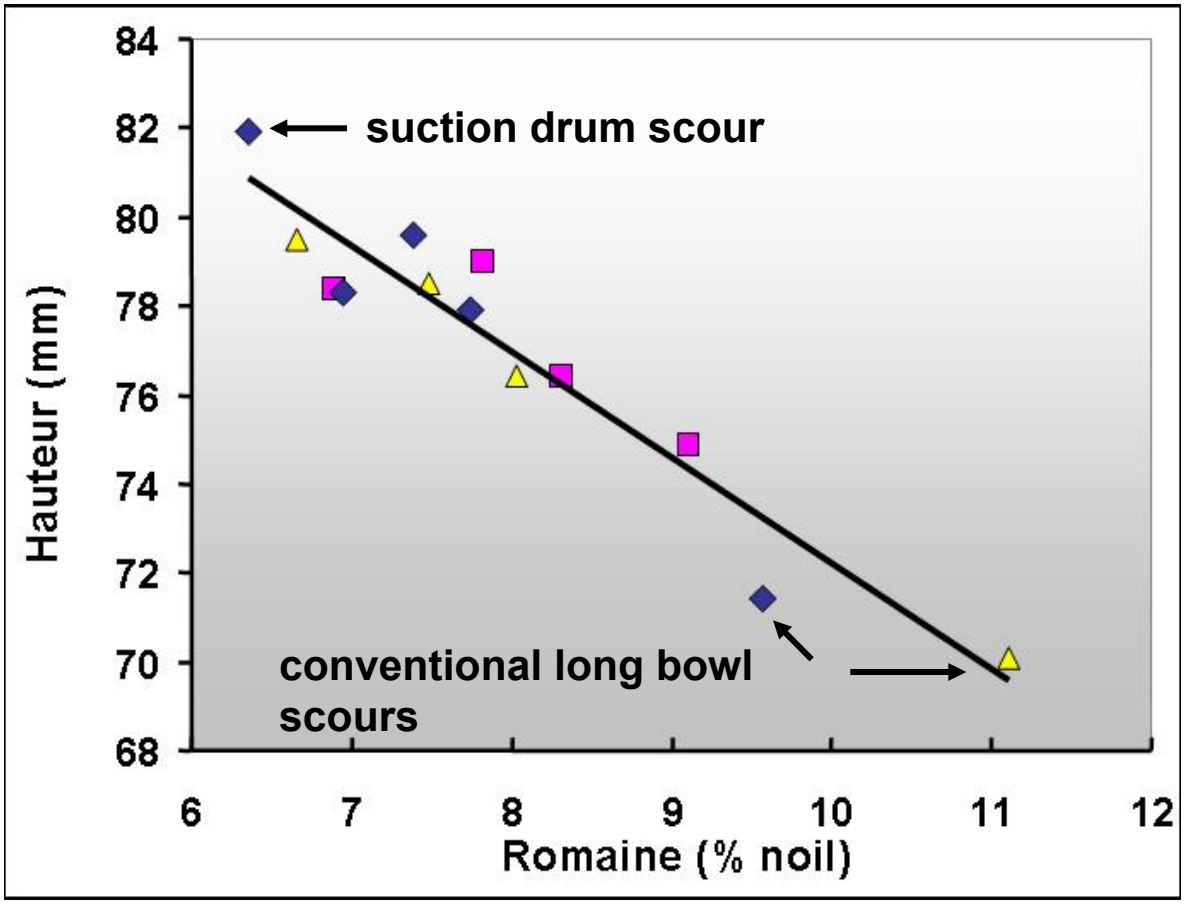
| Diameter (micron) | Greasy opened | Hauteur (mm) | Noil (%) |
|---|---|---|---|
| 20.3 | no | 71.0 | 5.5 |
| | yes | 70.1 | 6.6 |
| 21.3 | no | 68.6 | 6.3 |
| | yes | 65.7 | 7.3 |
| 22.0 | no | 74.6 | 4.3 |
| | yes | 75.2 | 4.4 |
| 25.7 | no | 86.0 | 3.0 |
| | yes | 82.1 | 3.6 |

**G.A. Robinson 1986**

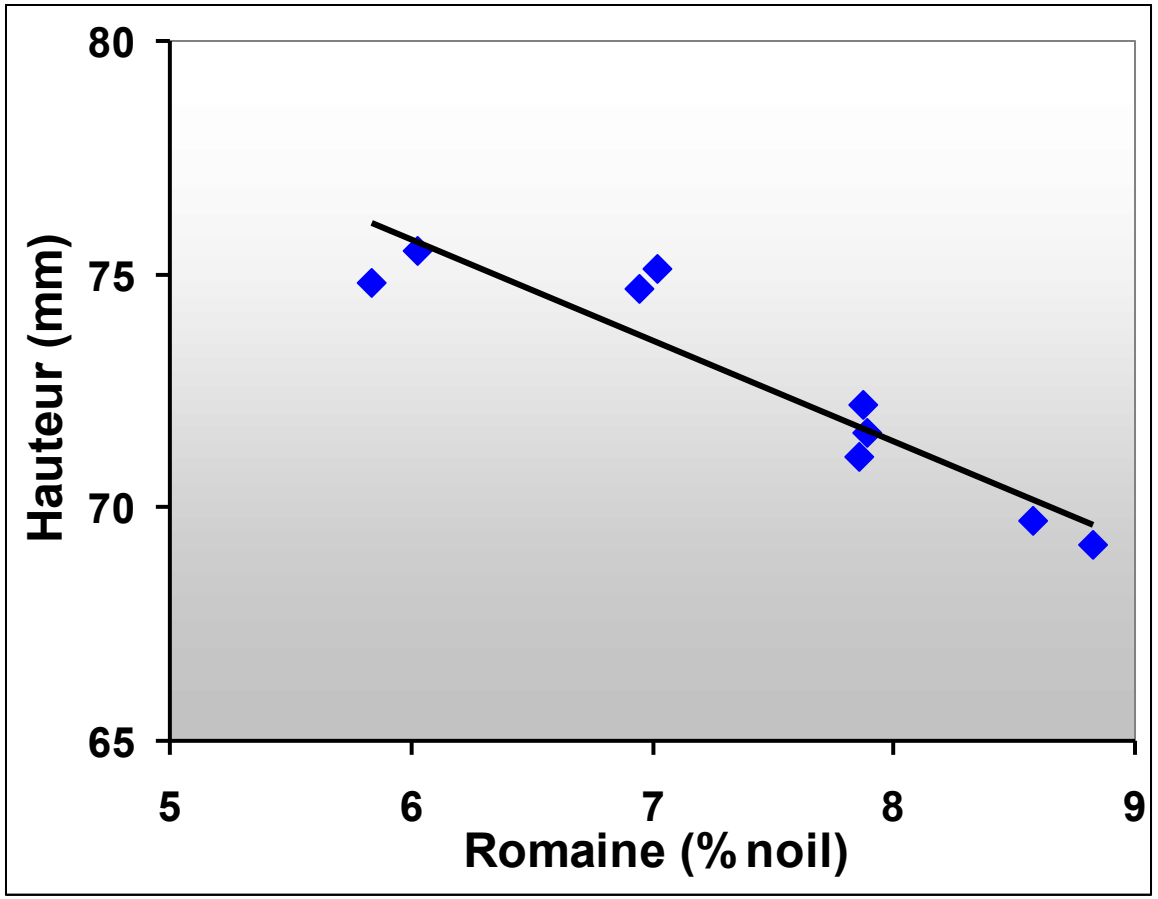
# Relationship between Hauteur and Romaine - IWS Trials



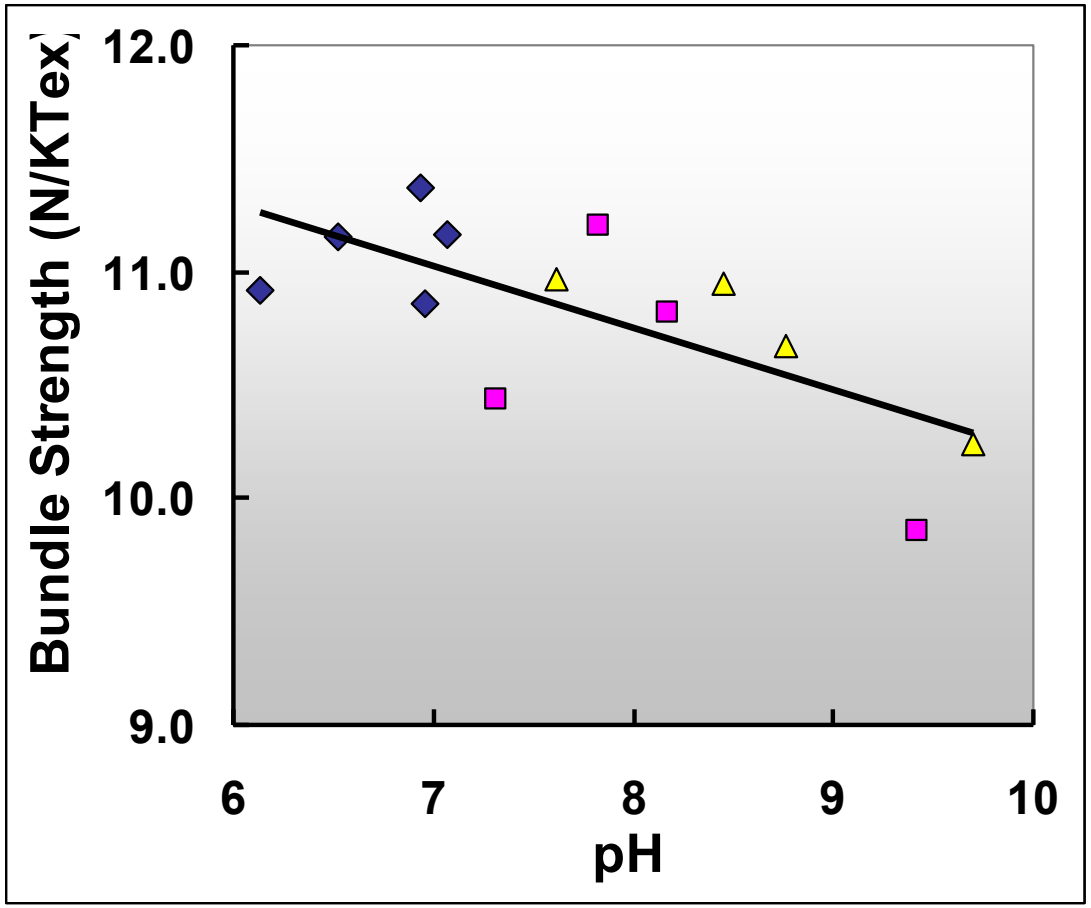
# Top Characteristics (ACIAR – First Series)



# Top Characteristics (ACIAR – Second Series)

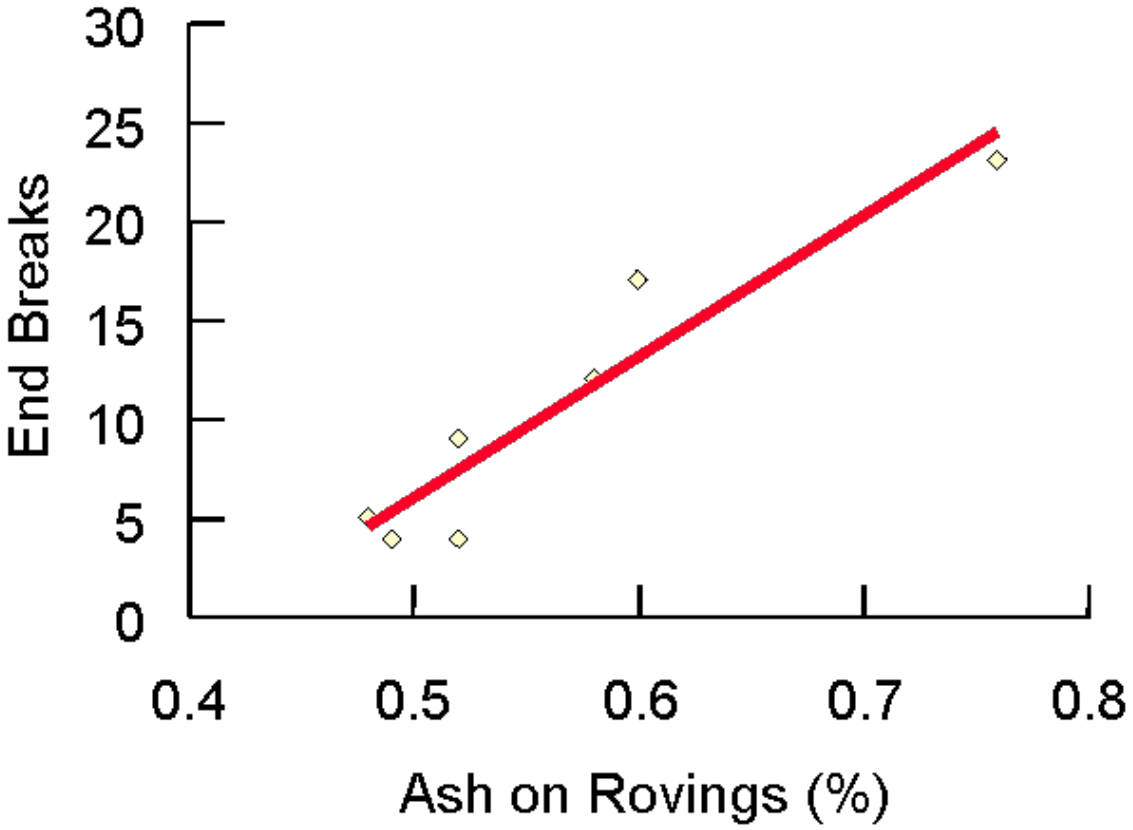


# Fibre Damage

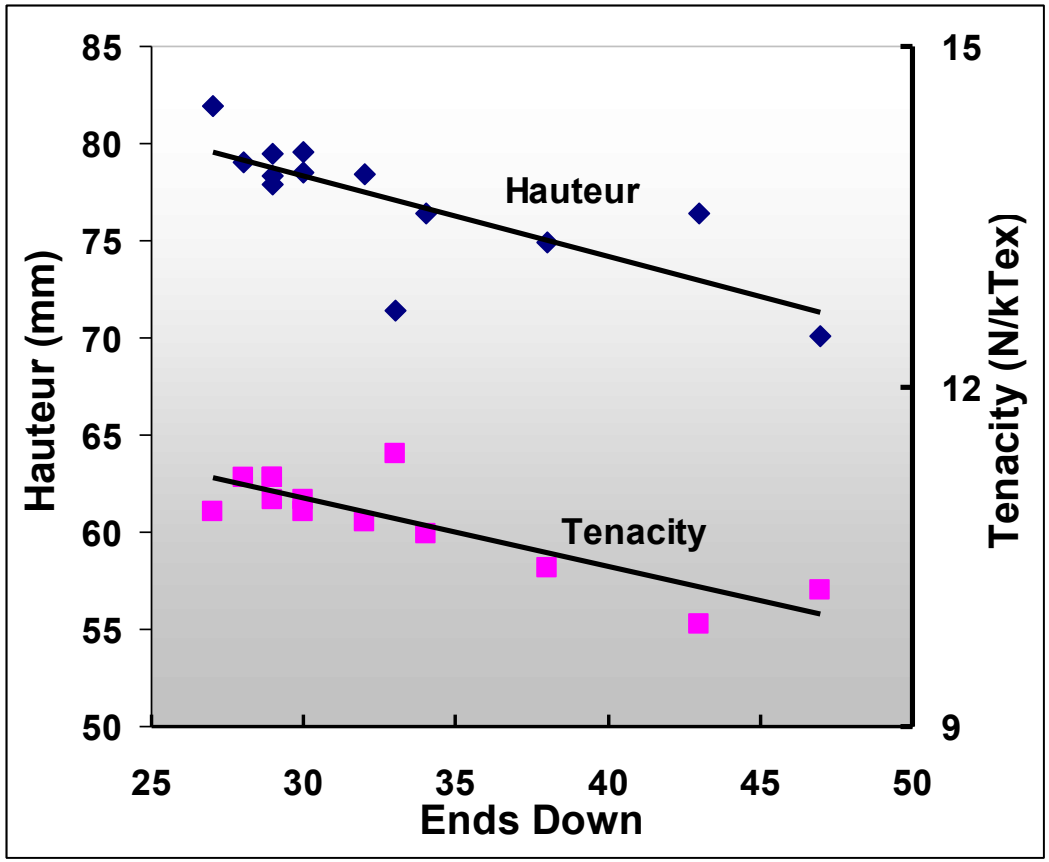


# Effect on Spinning Performance

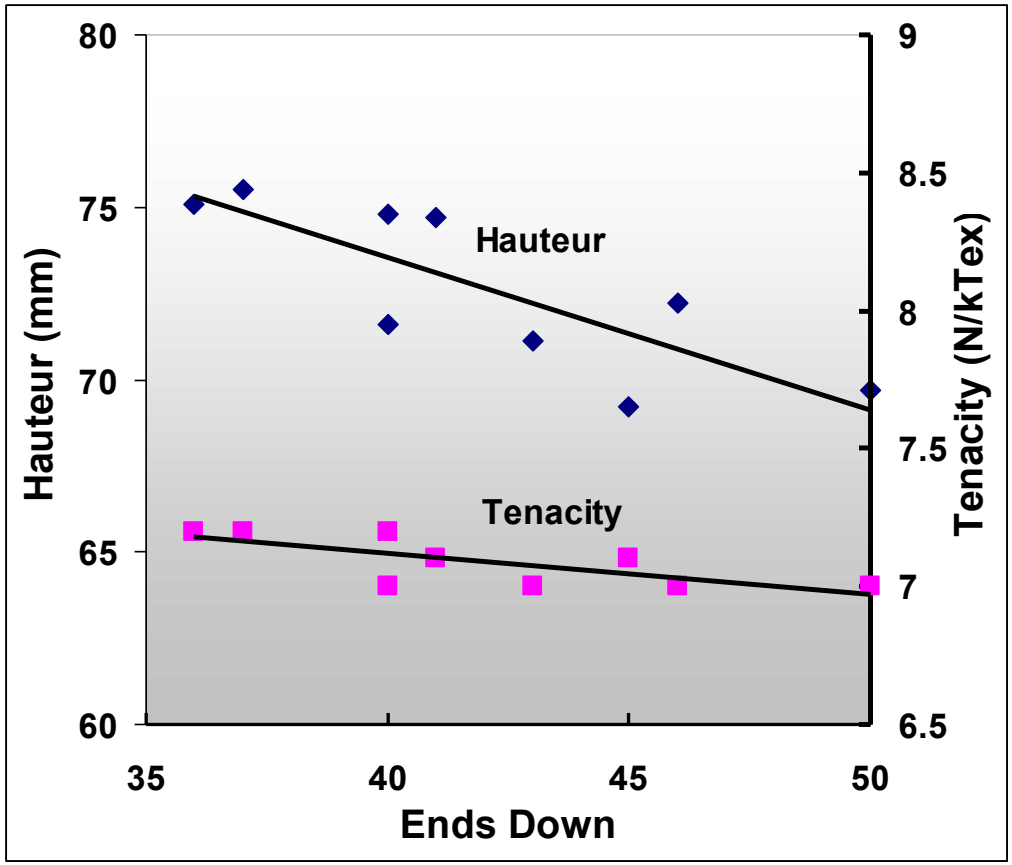
# Effect of Ash on Spinning



# ACIAR Trials – First Series



# ACIAR Trials – Second series



# So What?

# Financial Implications

| PLANT | Reduction of 1%Romaine | Plant efficiency % | Product Value USD | Potential Gain USD/ann. |
|---|---|---|---|---|
| **Greasy to top 1,000kg/hr** | +10kg/hr | 80 | 8.00 (10.00 – 2.00) | 0.67M |
| **Vertical – greasy to fabric. 350kg/h** | +3.5kg/hr | 70 | 15/lin.metre (3m/kg) | 1.32M |

# SUMMARY

- Scouring has a significant affect on topmaking performance
- Fibre entanglement can lead to substantial monetary losses
- Risk of fibre damage increases with pH