Introduction to Yarnspec

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Yarnspec

Yarnspec aims to predict what a good modern mill can expect to achieve using a particular wool top for a given yarn under specified spinning conditions.

Yarnspec

This is a powerful and necessary tool for a closed quality control system that enables ongoing improvement and reduces error margins on cost and performance.

Yarnspec

Currently, Yarnspec only applies to pure wool worsted yarns.

It was specifically developed for ecru weaving yarns and here it has been most extensively validated.

However, it is designed to handle the full range of dyed and un-dyed worsted knitting and weaving yarns.

Yarnspec

- Based on the premise that 'best commercial practice', in terms of spinning performance and yarn quality, is indeed predictable.

- Assumes that the wool top has been scoured and combed to appropriate standards and seeks to quantify the effect of wool fibre properties of the top on spinning performance.

Yarnspec

- Enables the effect of different fibre properties to be explored.
- Enables a mill to explore whether different top specifications may meet its needs at a cheaper price.

Some key messages

- Mean diameter is overwhelmingly the most important top fibre property.

- Mean fibre length is the next most important fibre property.

- Fibre strength is possibly the third most important factor.

Some key messages

- The importance of diameter distribution (CVD) is as expected.

- The importance of CVH on yarn properties and spinning performance is overrated.

Yarnspec prediction

SIROLAN – Yarnspec CSIRO Textile and Fibre Technology			
Mill	Geelong	**Date**	07-07-2004
Yarn code	External client	**Description**	Solospun yarn
Wool Properties			
Wool lot	External client	**Description**	CSIRO top
Fibre diameter	20.7 µm	**CV-D**	20.8 %
		Curvature	57.8 °/mm
Hauteur	93.5 mm	**CV-H**	46.0%
		% < 30 mm	7.0
Fibre tenacity	10.51 cN/Tex	**Tensor calibration**	1.0
Shrink proofed	no	**Dyed**	no
		Backwashed	no

Yarnspec prediction

Processing details			
Spinning draft	19.6	**Ring size (mm)**	55
Spinning (rpm)	9000	**Traveller number**	23
Re-combed	No	**Traveller wt (mg)**	112
Yarn properties			
Singles			
Tex	40.16	**Nm**	24.9
Twist	429 tpm	**Metric twist factor**	86.0

Yarnspec prediction

Evenness	Predicted	Measured
I	1.13	
CV %	13.1	
U %	10.5	
Thin Places / km	7	
Thick Places / km	1	
Neps / km	11	
Hairiness	5.12	

Yarnspec prediction

	Predicted	Measured
Tenacity (cN/Tex)		
@ 5 m/min	8.03	
Elongation (%)		
@ 5 m/min	22.4	
Breaking load (gF)		
@ 5 m/min	329.1	
Ends down / 1000 sp.hr	6	

Yarnspec – evenness
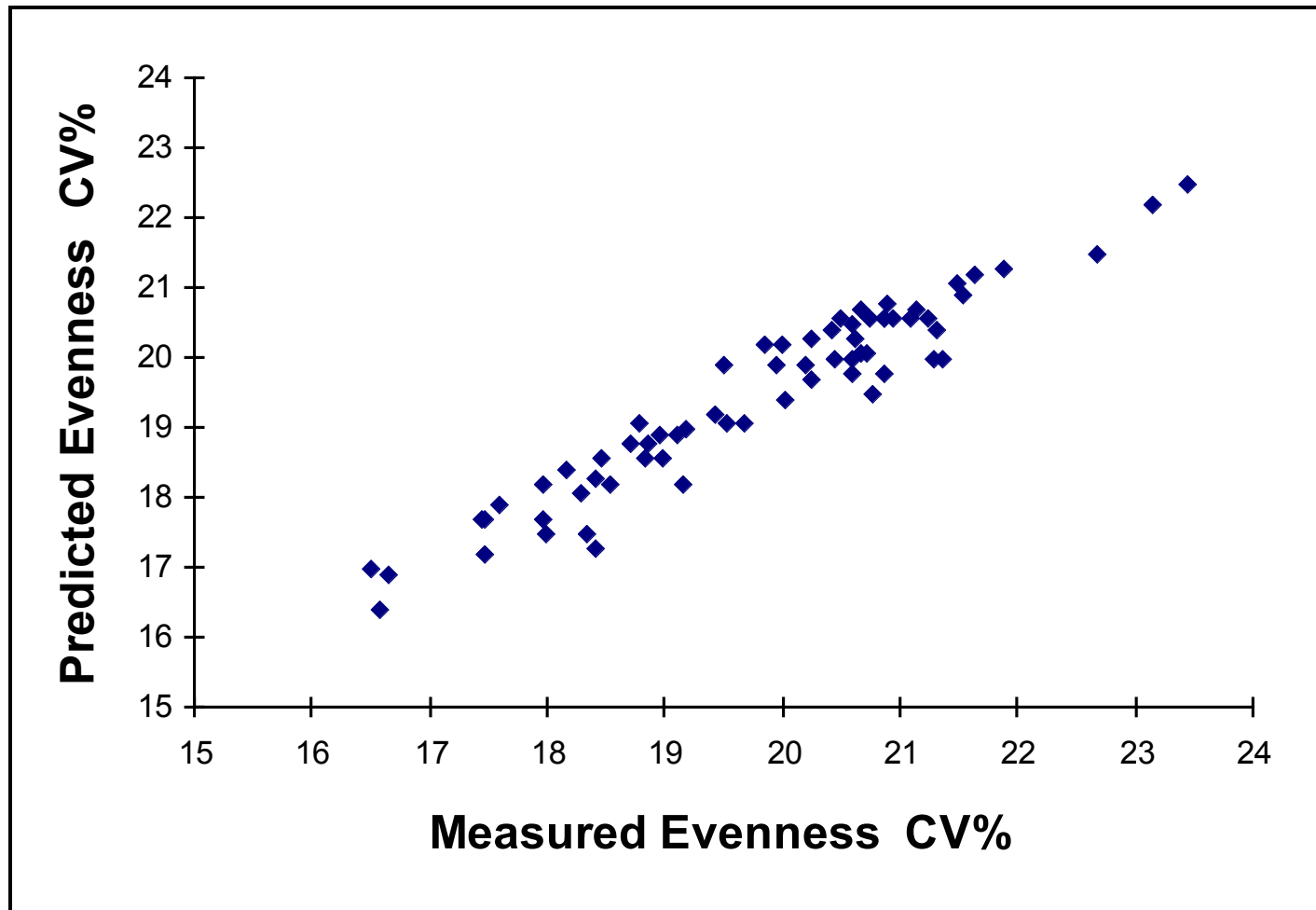
Yarnspec – tenacity
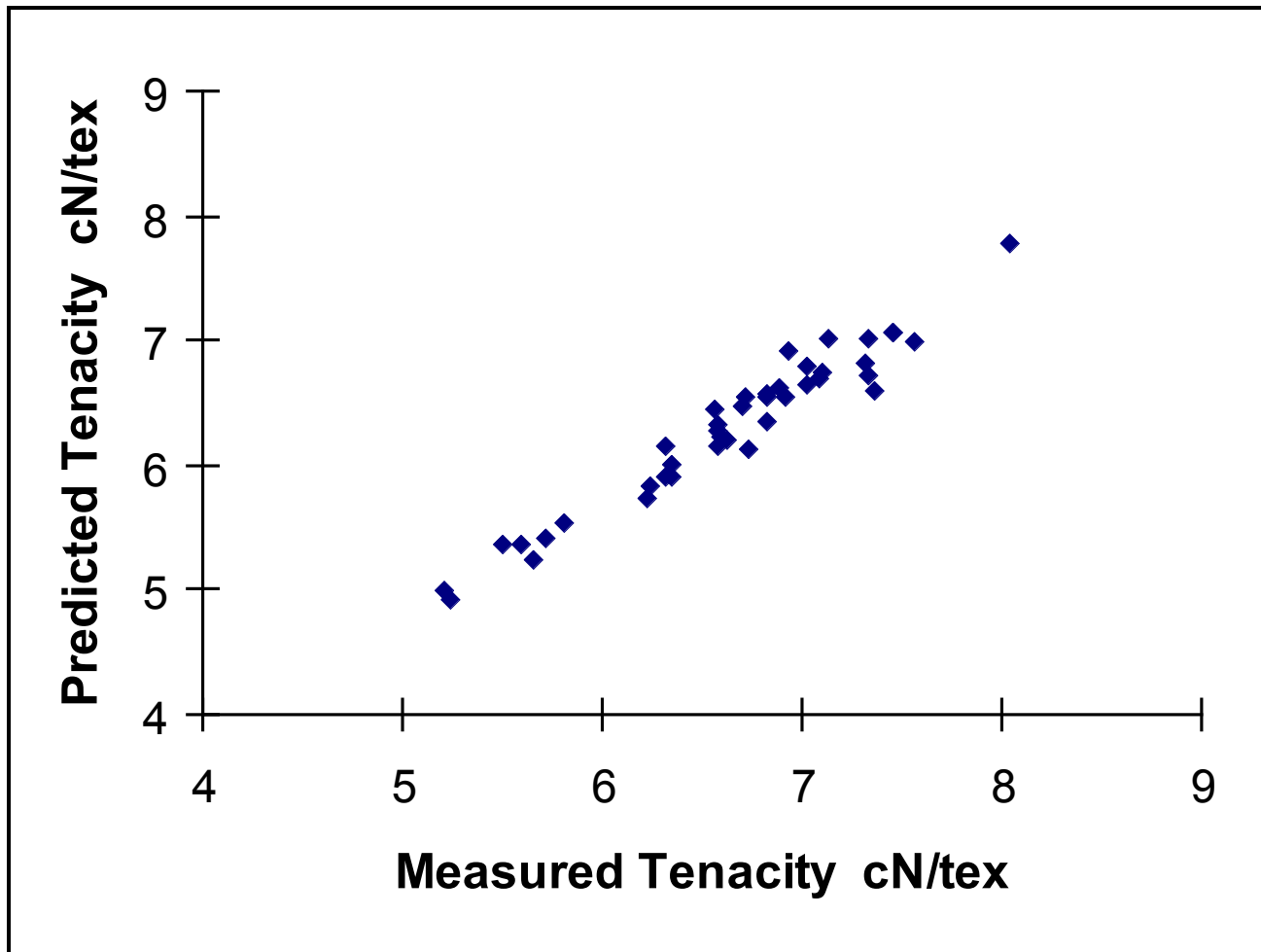
Yarnspec – ends down
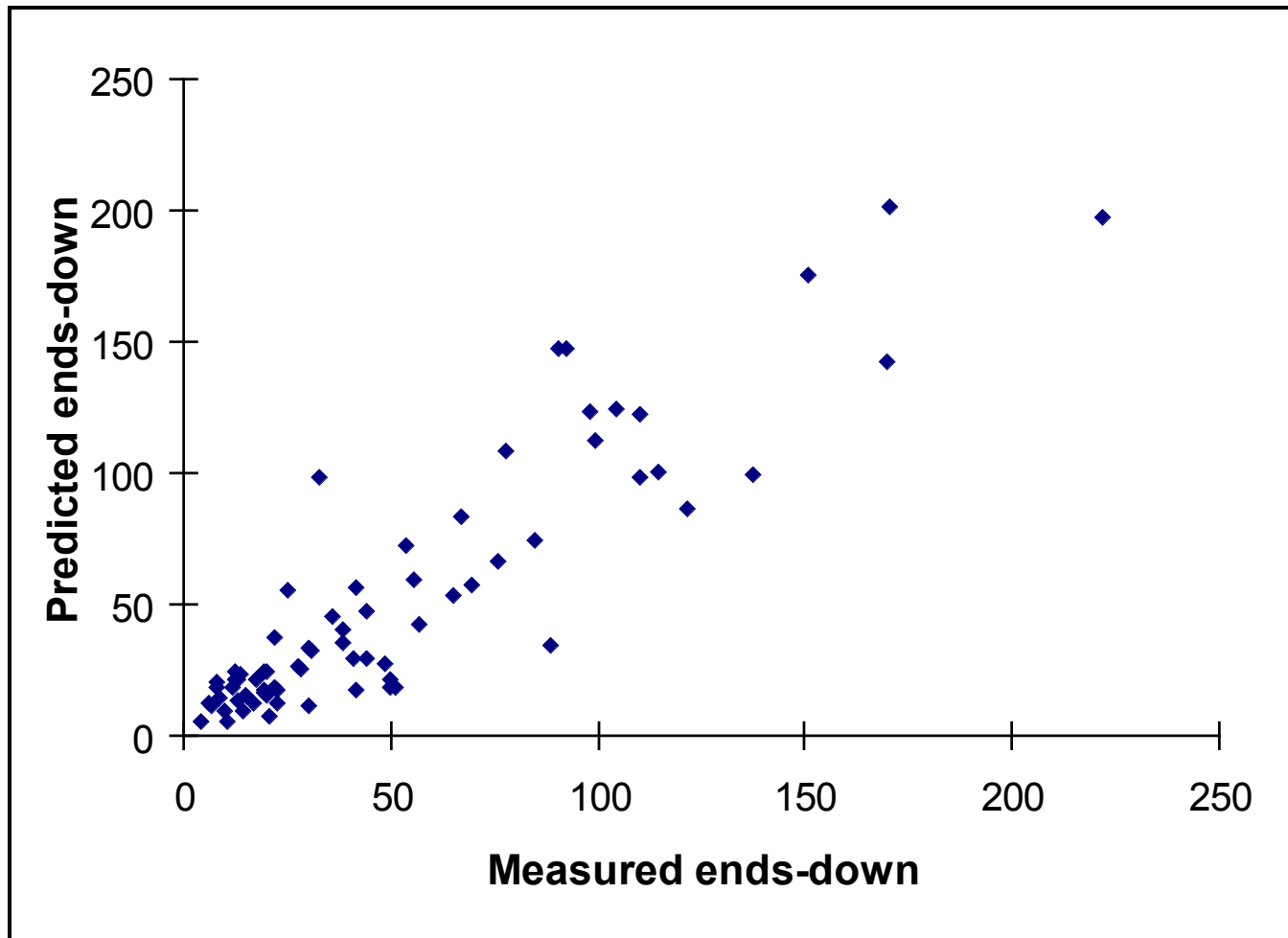
Fibre diameter

Diameter	20	21	22	23	24
No. of fibres	46	42	38	35	32
Evenness (CV %)	18.7	19.5	20.4	21.2	22.2
EDMSH	15	26	49	98	215

Using: Nm 50, 20 Tex, 636 tpm, CVD=23%, H=70 mm, fibre tenacity = 11.12cN/tex, re-combed, spun at 9 000 rpm with #27 traveller on 55 mm rings.

Hauteur

Hauteur (mm)	50	60	70	80	90
Evenness (CV %)	21.1	20.7	20.4	20.0	19.7
EDMSH	228	92	49	29	19

Using: Nm 50, 20 Tex, 636 tpm, CVD=23%, H=70 mm, fibre tenacity = 11.12cN/tex, re-combed, spun at 9 000 rpm with #27 traveller on 55 mm rings.

Bundle tenacity

Bundle tenacity	9	10	11.12	12.24
EDMSH	123	73	49	37

Using: Nm 50, 20 Tex, 636 tpm, CVD=23%, H=70 mm, fibre tenacity = 11.12cN/tex, re-combed, spun at 9 000 rpm with #27 traveller on 55 mm rings.

CV-diameter

CV-D %	18	20.5	23	25.5	28
Evenness (CV %)	19.5	19.9	20.4	20.9	21.5
EDMSH	26	35	49	72	112

Using: Nm 50, 20 Tex, 636 tpm, CVD=23%, H=70 mm, fibre tenacity = 11.12cN/tex, re-combed, spun at 9 000 rpm with #27 traveller on 55 mm rings.

Sirolan Yarnspec

- A quality control tool.
- Predicts yarn properties and spinning performance.
- Improves communication between top maker and spinner.
- Tailors top properties and price to meet spinner's needs.

AUSTRALIAN WOOL
TEXTILE TRAINING CENTRE