



CRC

for

Premium

Quality

Wool

High Speed Carding

Produced for the CRC for Premium Quality Wool undergraduate program by;
Gary Robinson, CSIRO Textile & Fibre Technology.



Increasing card productivity

- wool < other fibres
- \$1M per card
 - lowest productivity in topmaking
- increase productivity
 - increase width
 - limit reached
 - 3.5m
- Is there another way?
 - increase rate of feed
 - INCREASE SPEED

CRC

for

Premium

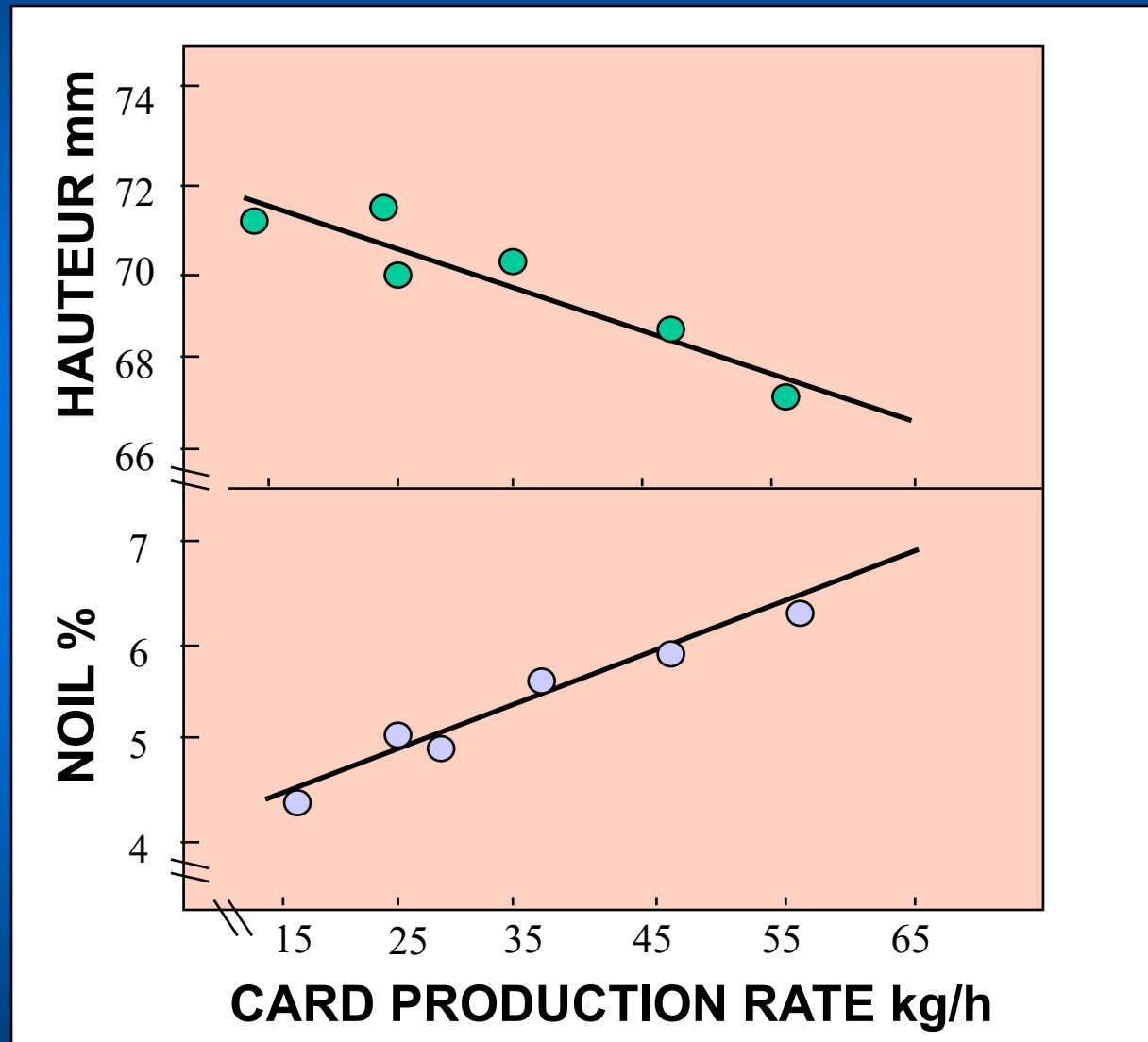
Quality

Wool



The effect of increased feed

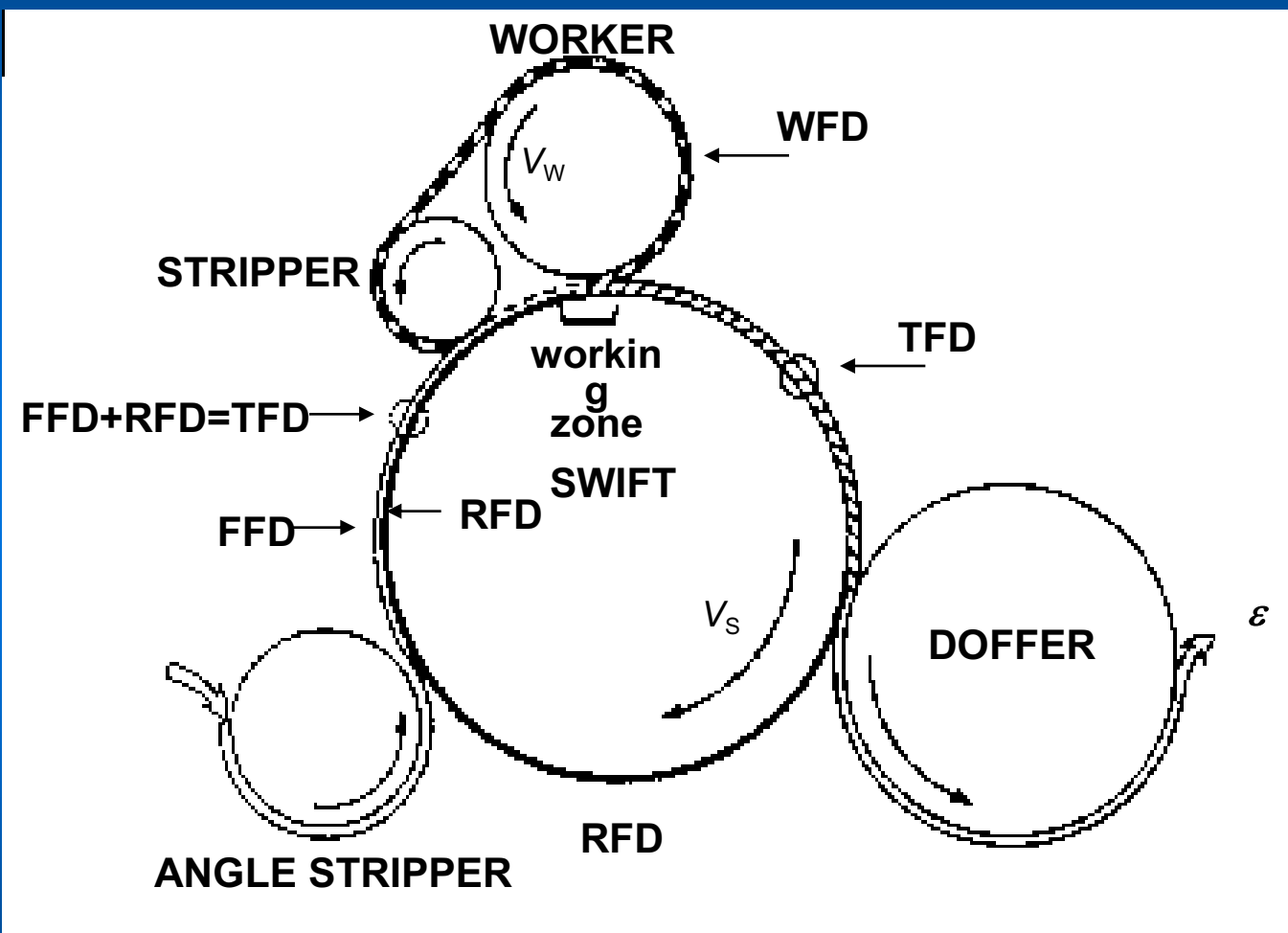
CRC
for
Premium
Quality
Wool





Fibre flow on the Worsted Swift

CRC
for
Premium
Quality
Wool





Effect of FFD & Card speed (design)

Experimental Condition	Card Production Rate (kg/m/h)	Card Speed (Swift m/min)	Fresh Fibre Density (g/m²)
I	17	450	0.6
II	30	450	1.1
III	30	800	0.6
IV	53	800	1.1

CRC

for

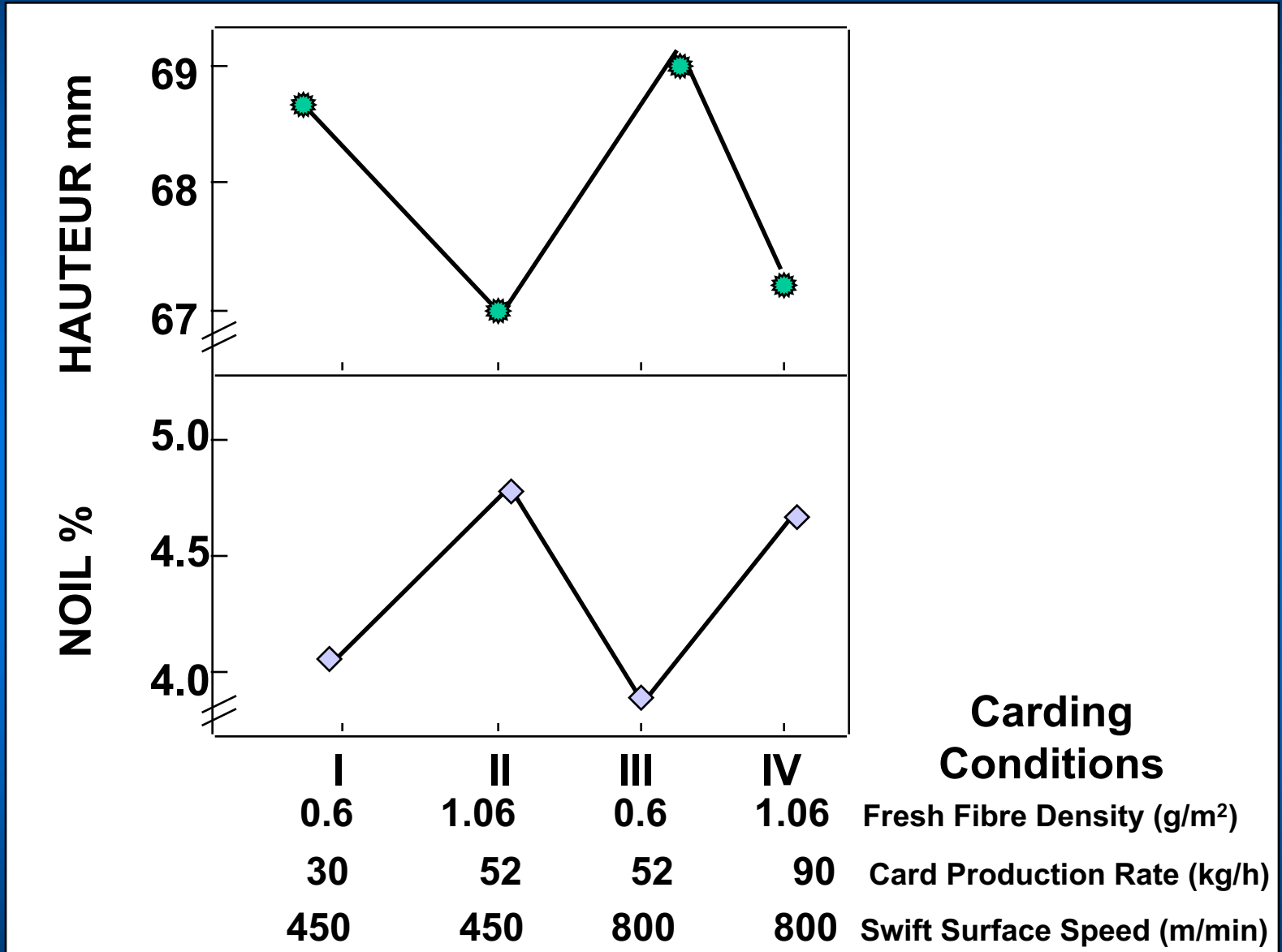
Premium

Quality

Wool



Effects of FFD and speed



CRC

for

Premium

Quality

Wool



Problems with increased speed

- **Feeding**
 - better control needed
- **VM removal**
 - burr beater design
- **Delivery**
 - doffer design
- **Air Control**
 - more movement of air
 - more fly

CRC

for

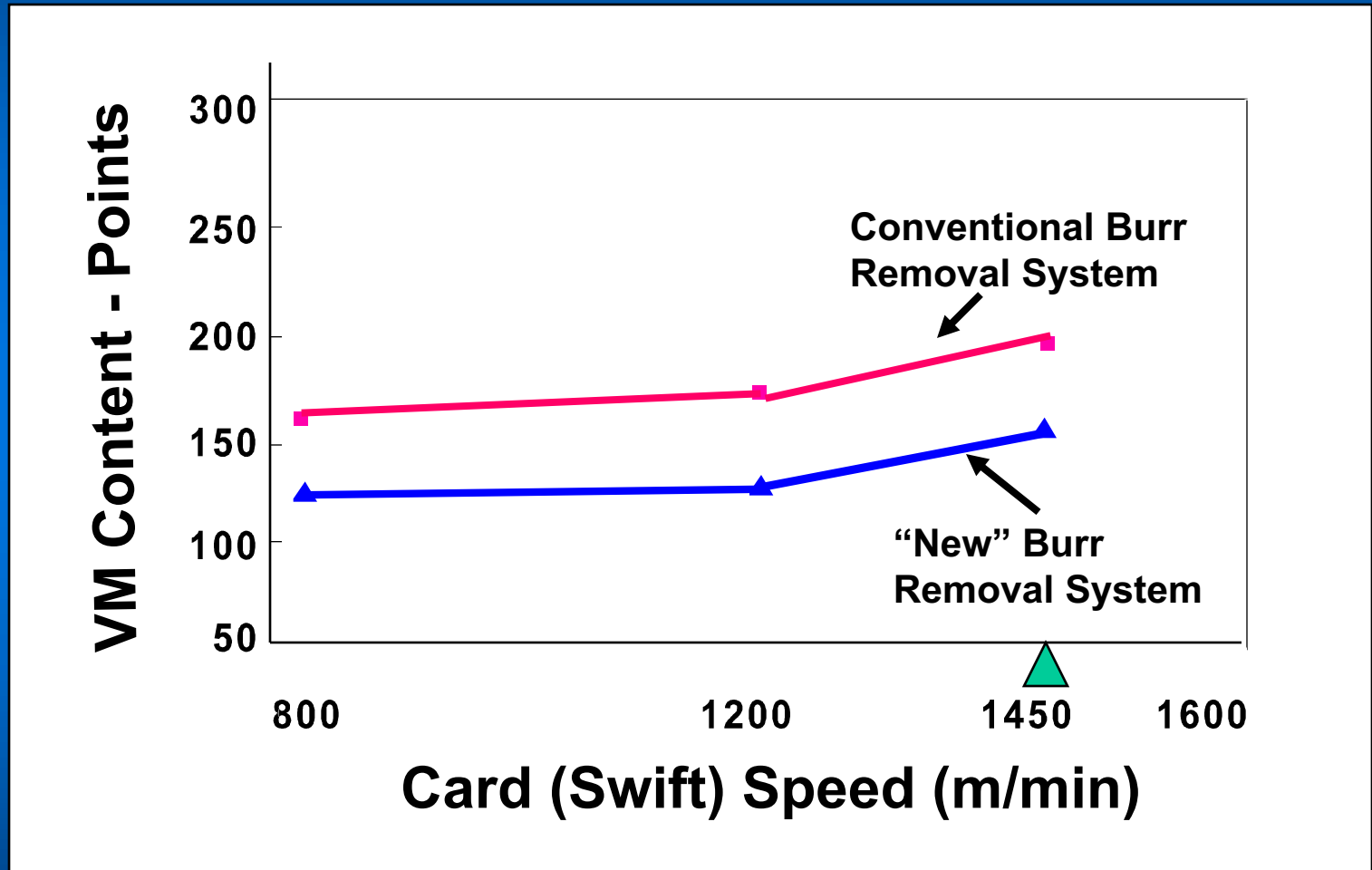
Premium

Quality

Wool



Effect of Card speed on VM content of Tops



CRC

for

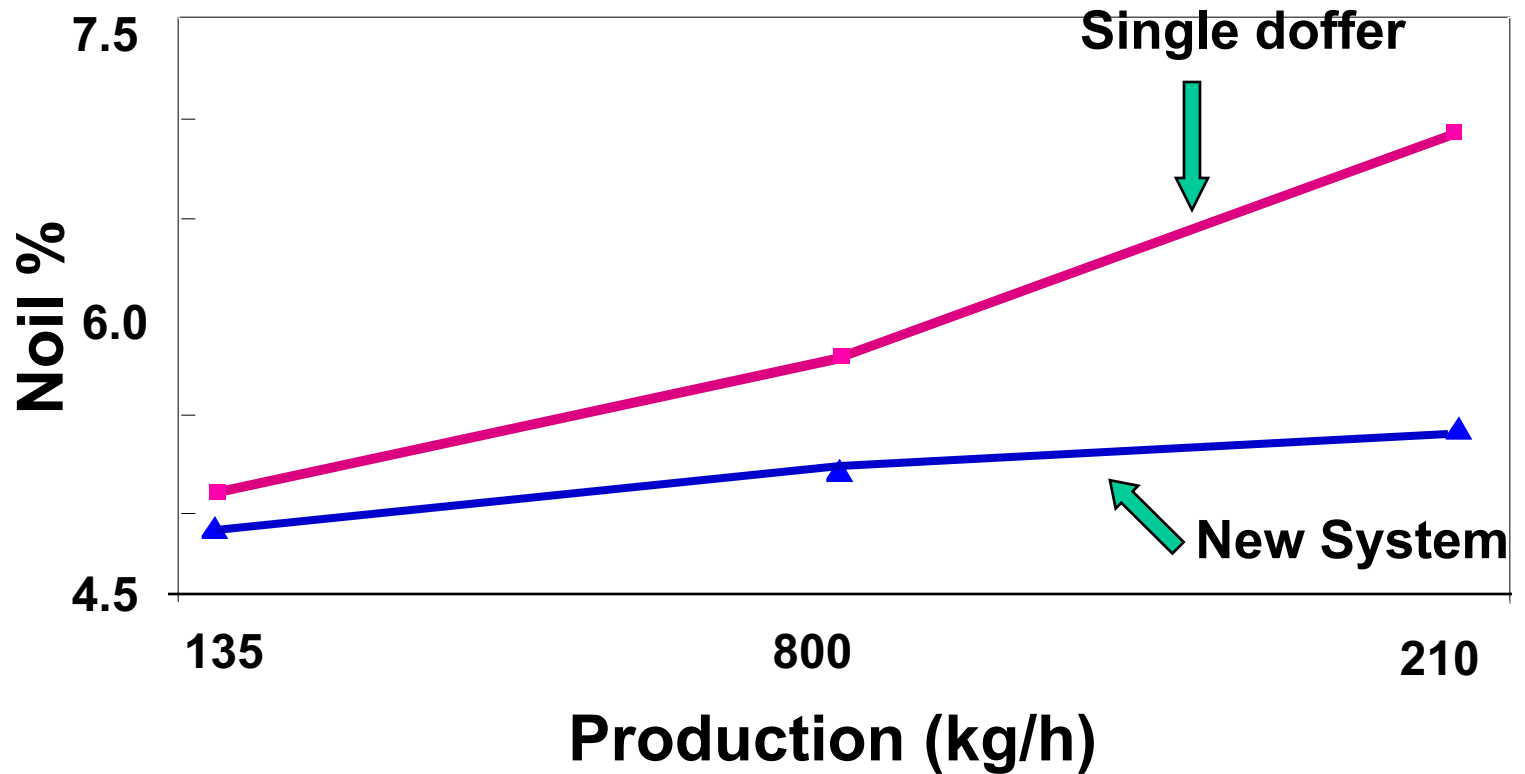
Premium

Quality

Wool



New Doffing System: Noil% improvement



CRC

for

Premium

Quality

Wool



High Speed Carding Results

Card (Swift) Speed m.min^{-1}	Production Rate Kg/h/m	Card Yield %	Combing Noil %	Hauteur mm	% Fibres 25 mm	VM Content Points
600	43	96.7	5.0	67.1	10.1	164
800	58	96.8	5.0	67.5	10.4	157
950	69	96.1	5.1	67.4	10.2	181
1074	78	98.0	4.5	67.7	10.1	143
1150	84	97.0	5.2	67.4	9.9	156
1274	92	95.0	5.4	71.1	8.2	169
1444	105	95.4	5.8	68.8	10.2	205

CRC

for

Premium

Quality

Wool



CARD production rates (Thibeau Cards)

CRC for Premium Quality Wool	Superfine 18 micron 2%VM on scoured wool 100% fleece	2.5m ww CA7 2.5m ww TRIO	120kg/hr 80 kg/hr	+50%
	Australian merino fleece 22 micron 4% VM on scoured wool	2.5m ww CA7 2.5m ww TRIO	200 kg/hr 110 kg/hr	+80%
	Very burry Aust. wool 24 micron 11% VM on scoured wool	2.5m ww CA7 2.5m ww TRIO	240 kg/hr 130 kg/hr	+85%
	Uruguayan wool 27 micron 1% VM on scoured wool	2.5m ww CA7 2.5m ww 3M2M5	400 kg/hr 190 kg/hr	+110%