



A basic guide to **cotton pricing & quality**



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The cash price of Australian cotton.

There are three main factors that influence the cash price of cotton:

- New York Futures
- Basis
- Currency

Each of these variables can move independently, with 80 per cent of price volatility attributed to futures and currency.

Futures – Australian cotton prices are based on the New York cotton futures which are traded in US dollars. A futures contract is a commitment to make or take delivery of a specified quantity and quality of cotton at an agreed price at some time in the future.

Basis – The basis is the difference between the cash price of a physical bale of cotton (at a specified location) and the New York Futures price. It can be a premium to the price (on) or a discount to the price (off). For example a merchant may quote to purchase cotton ex gin at 400 points on Dec. If Dec futures are at 55.49USc/lb, the merchant is buying cotton at 59.49USc/lb, the basis is +4.00USc/lb (400 points on).

Currency – The price of an Australian bale of cotton is fixed in US dollars and as Australian cotton growers prefer to be paid in AUD, the sale price needs to be converted from USD to AUD.

Example

- Futures - July 17 - 71.6 USc/lb
- Basis - 300 points on July futures
- Currency - Spot AUD 0.7237 AUD/USD exchange rate

Step 1. Add futures and basis to obtain US cents per pound: $71.6 + 3 = 74.6$ USc/lb

Step 2. Multiply US cents per pound by 500 pounds to obtain US dollars per bale: $74.6 \times 500 = \$373$

Step 3. Divide USD per bale by forward AUD exchange rate. Result is AUD per bale: $\$373/0.7237 = \515 .

The cotton marketing system is a niche market when compared to grain marketing - consisting of approx. 1000 growers and 13 merchants.

Merchants involved in the cotton market tend to build robust relationships with clients and may be contracting forward contracts with these growers up to four years into the future. It is common that cotton merchants will approach growers to lock in business. Only a very small proportion of cotton is traded on the spot market at harvest.

A list of merchants is available at the Australian Cotton Shippers Association site: www.austcottonshippers.com.au.

Further market information is available at: www.cottoncompass.com.au.



The classification of cotton.

Colour

Colour can be classed either visually by a trained cotton classer or by a High Volume Instrument (HVI). When cotton is classed visually, the classer compares the sample to a standard lint sample of known grade provided by the United States Department of Agriculture (USDA).

The colour grading of Upland cotton takes into account both major and minor differences in colour. Major colour differences occur between the five classes of 'white', 'light spotted', 'spotted', 'tinged' and 'yellow' stained cotton, chiefly due to increasing degrees of yellowness across the five classes.

Within each of these classes the reflectance or whiteness of the fibre is assessed across another eight levels from 'Good Middling' to 'Below Grade'. There are currently 25 official physical colour grades for Upland cotton and five grades for below grade colour.

The below table lists the official colour grades applied to Upland cotton.

The colour of cotton as measured by HVI is determined by a colorimeter and defined in terms of the Nickerson-Hunter colour model, in terms of brightness (Rd) and yellowness (+b).

Colour management

Managing to improve colour is largely the result of harvesting the crop as soon as possible. When a boll first opens the lint is white and clean due to the highly reflective nature of cellulose and the lack of microbial degradation.

If the crop gets wet due to rain it is important to wait for the crop to dry and bleach from sun and wind, prior to harvesting. However, when lint is exposed to moisture for a long time, fungi will start to grow on the lint surface with the fungal spores causing the lint to become grey and dull.

Designation/Abbreviation		White	Light Spotted	Spotted	Tinged	Yellow/Stained
Good Middling	GM	11	12	13	-	-
Strict Middling	SM	21	22	23	24	25
Middling	M	31	32	33	34	35
Strict Low Middling	SLM	41	42	43	44	-
Low Middling	LM	51	52	53	54	-
Strict Good Ordinary	SGO	61	62	63	-	-
Good Ordinary	GO	71	-	-	-	-
Below Grade	BG	81	82	83	84	85

The classification of cotton (cont).

Trash

Trash is a measure of the amount of non-lint material in the cotton sample. Leaf grade is classified separately to colour from level 1 (least trash) through to level 7. Trash is assessed visually with grade boxes (similar to colour) or by a trash meter by the HVI machine.

Trash is removed in both the ginning and spinning processes. When it is removed in the spinning process it contributes to increased cost and decreased fibre yield. Hence, cotton with high levels of trash attracts a discount.

Trash management

Trash levels are directly and indirectly influenced by the defoliation process. Poor defoliation is often a result of a combination of factors such as high residual nitrogen, high soil moisture at the time of defoliation, extreme level of water stress, rapidly growing plants or regrowth, cool temperatures at defoliation and high rates of defoliant that freezes leaves on the plant.

Extraneous matter

Extraneous matter is any foreign contaminant such as grass, bark, plastic, oil, seed coat fragments etc. These are classed visually and attracts a separate discount from the normal trash discount.

Fibre length

Fibre length is the average length of the longer half of the fibres. It is reported in either 100ths and 32nds of an inch, or in inch and mm. It is measured either by pulling a hand staple, or by the HVI machine by passing a beard of parallel fibres through an optical sensing point.

Fibre length management

Fibre length is controlled largely by variety and to a minor extent by weather and management. As fibre length within a boll is determined in the first 20 days after flower, high temperatures, severe water stress and potassium deficiency can decrease fibre length.

All these factors affect the internal carbohydrate supply and moisture level inside a boll. Growing conditions that increase the level of carbohydrate to the bolls generally increase length and strength of the fibre. Length can also be affected by ginning. Low moisture levels at ginning and excessive lint cleaning can decrease fibre length and increase short fibre content.

The classification of cotton (cont).

Micronaire

Micronaire is a measure of fibre diameter and is a combination of fibre fineness (linear density) and maturity (wall thickness).

It is measured by the HVI using airflow that correlates fibre micronaire to the permeability to air of a constant mass of cotton fibres compressed into a tube of a fixed volume. There is a base range of fibre micronaire (3.5 - 4.9) with discounts for lower and higher levels.

Low micronaire is generally equated to immature fibre, which does not readily absorb dye and thus creates an uneven dye pattern in the finished cloth. Low micronaire cotton is more likely to form neps (minute knots of tangled fibre) in the ginning and yarn manufacturing process. High micronaire cotton can only be used in coarse fabrics like denim.

Micronaire management

As the micronaire of the fibre is determined in the second half of the boll fill period when secondary filling of the fibre occurs, management factors affecting micronaire will affect this time of growth.

Premature defoliation can result in low micronaire cotton. Potassium deficiency can cause low micronaire as a high boll load combined with low potassium

levels, can lead to premature senescence.

The loss of the top leaves results in a failure to fill the top bolls. Other factors that can create this condition are dense stands and/or high nitrogen/irrigation frequencies. These conditions can promote rank growth causing increased shading of lower leaves thereby reducing carbohydrate supply.

Cool conditions, late in the season, often causes low micronaire conditions as crops will have a good boll load from ideal conditions and when it turns cool/cloudy, carbohydrate production is reduced, thereby reducing the amount of secondary filling of the late set bolls. The risk of low micronaire cotton is greatly increased with late crops.

Fibre strength

Fibre strength is reported in terms of grams per tex (g/tex), with the tex unit being equal to the weight in grams of 1000 metres of fibre. Thus strength is the force required to break a bundle of fibres in tex unit in size.

Strength measurements are made on the same beards of cotton that are used for measuring fibre length. The beard is clamped in two sets of jaws 1/8 inch apart.

The classification of cotton (cont).

Fibre strength is highly correlated to yarn strength. A strong fibre is less likely to break during the manufacturing process. The following is a guide:

- Very strong 30+ g/tex
- Strong 27 - 29 g/tex
- Intermediate 24 - 26 g/tex
- Weak 21 - 23 g/tex
- Very weak 20 g/tex and below

Fibre strength management

Strength is mostly determined by variety. Growing conditions that produce high yields also tend to produce high fibre strength.

Exposure to fungi can reduce strength. Potassium deficiency can decrease strength by up to 2g/tex which would also reduce yield by 40 per cent. The effects of ginning is minimal, except where excessive heat is used which can reduce strength.

Elongation

Elongation is the percent that the fibre extends before the maximum force is measured in the bundle break. It has a direct influence on yarn elongation, structure and yarn breaks.

Conclusion.

HVI also test for short fibre content (SFC) which is the amount of fibres shorter than 12.7 mm (0.5 inch).

The grower is not discounted for SFC, however the mills use it to determine their laydowns (bale selection for various yarns).

In the future it is anticipated that further classing by HVI will include fineness, maturity, dust content and stickiness.

In Australia the base grade in the classing system is a white middling (colour grade), with a level of leaf material (trash) of 3, and a staple length of 36 (1.11-1.13 inch or 1 1/8th inch). That is 31,3,36.

As cotton is marketed in US cents/lb, the Premium and Discount (P&D) sheet is in US cents, where 100 points equals one US cent. As a guide 100 points is around 5 AUD. See Appendix 1 for a typical P&D sheet.

As the growers return is a function of yield and grade, there are management factors that affect not only yield, but also grade. Selection of a high quality variety managed for high yield, defoliated cleanly and picked before adverse weathering has occurred will result in producing high quality cotton.



Appendix 1. Example of a Premium and Discount sheet

NAMOI		Namoï Cotton Co-operative Ltd					
COTTON		Schedule 1/2003 of Premiums and Discounts, US Cent Points per Pound of Lint Cotton					
Crowing Together		Staple Length					
Colour	Leaf	33	34	35	36 and above		
W H I T E	GM11	Leaf 1	-1000	-600	50	100	
		2	-1000	-600	50	75	
		3	-1000	-600	50	75	
		4	-1100	-700	-200	-200	
		5-7	-1600	-1200	-600	-600	
	SM21	Leaf 1-2	-1000	-600	50	50	
		3	-1000	-600	50	50	
		4	-1100	-700	-200	-200	
		5	-1200	-900	-600	-600	
		6-7	-2000	-1500	-1000	-1000	
	MID 31	Leaf 1-2	-1000	-600	0	0	
		3	-1000	-600	0	0	
		4	-1150	-850	-250	-250	
		5	-1400	-1100	-600	-600	
		6-7	-2000	-1500	-1000	-1000	
SLM 41	Leaf 1-2	-1200	-900	-600	-600		
	3	-1200	-900	-600	-600		
	4	-1200	-900	-600	-600		
	5	-1400	-1100	-800	-800		
	6-7	-2000	-1700	-1400	-1400		
LM 51	Leaf 1-3	-1800	-1500	-1200	-1200		
	4	-1900	-1600	-1300	-1300		
	5	-1900	-1600	-1300	-1300		
	6-7	-2200	-1900	-1600	-1600		
	SGO 61	Leaf 1-4	-2200	-1900	-1600	-1600	
5		-2300	-2000	-1700	-1700		
6-7		-2300	-2000	-1700	-1700		
Leaf 1-2		-1100	-700	-100	-100		
3		-1150	-850	-250	-250		
L I G H T S P O T	GM 12 & SM 22	4	-1200	-900	-600	-600	
		5	-1800	-1500	-1200	-1200	
		6-7	-2000	-2000	-2000	-2000	
		Leaf 1-2	-1200	-900	-400	-400	
		3	-1200	-900	-600	-600	
	MID 32	4	-1500	-1200	-900	-900	
		5	-1900	-1600	-1300	-1300	
		6-7	-2000	-2000	-2000	-2000	
		Leaf 1-3	-1900	-1600	-1300	-1300	
		4	-2000	-1700	-1400	-1400	
	SLM 42	5	-2200	-1900	-1600	-1600	
		6-7	-3000	-2500	-2500	-2500	
		Leaf 1-4	-3000	-2500	-2000	-2000	
		5	-3000	-2500	-2000	-2000	
		6-7	-3000	-2500	-2500	-2500	
S P O T T E D	SM 23	Leaf 1-2	-1200	-900	-600	-600	
		3	-1500	-1200	-900	-900	
		4	-2000	-1700	-1400	-1400	
		5	-2600	-2300	-2000	-2000	
		6-7	-3000	-3000	-2500	-2500	
	MID 33	Leaf 1-3	-1900	-1600	-1300	-1300	
		4	-2900	-2300	-2000	-2000	
		5-7	-3000	-3000	-2500	-2500	
		Leaf 1-4	-3000	-2500	-2000	-2000	
		5	-3000	-3000	-2500	-2500	
	SLM 43	6-7	-3000	-3000	-3000	-3000	
		Leaf 1-5	-3000	-3000	-3000	-3000	
		6-7	-3000	-3000	-3000	-3000	
		Leaf 1-5	-3000	-3000	-3000	-3000	
		6-7	-3000	-3000	-3000	-3000	

Micronaire differences	
2.4 and below	-2500
2.5 through 2.6	-2000
2.7 through 2.9	-1500
3.0 through 3.2	-1000
3.3 through 3.4	-500
3.5 through 3.7	0
3.8 through 4.1	0
4.2 through 4.5	0
4.6 through 4.9	0
5.0 through 5.2	-500
5.3 and above	-600

Strength	
32.0 and above	0
30.0 - 31.9	0
28.0 - 29.9	0
26.0 - 27.9	0
25.9 and below	-300

Additional Adjustments	
Light Grass	-150
Heavy Grass	-700
Light Bark	-150
Heavy Bark	-700
Preparation	0
Stickiness/Honeydew	-3500
Below Grade	-3500
Netp	0
Uniformity	0
Short Fibre Index	0
1/32" below 33 (32)	-300
1/16" below 33 (31)	-500
3/32" below 33 (30)	-500

Additional Clauses	
Any grade not specified will be considered below grade.	
Base Grade: 31 colour, 2 or 3 leaf, 1-3/32" (35)	
3.5 - 4.9 NCL (G5) Micronaire	
Namoï Cotton Co-operative Ltd reserves the right to charge any additional costs received from end users related to stickiness, cavtoma or contamination that may be identified in the spinning process.	
Cotton that incurs a discount for micronaire, staple, strength and / or contamination will not attract a grade premium.	
Cotton with contamination identified during the classification process may be rejected at Namoï Cotton's discretion	

Disclaimer: The figures in this 'P&D sheet' are only presented to show how merchants strike a pricing contract with a grower that takes into account the quality of the delivered cotton. The entries in this P&D schedule are deliberately dated and do not necessarily indicate any current or past contract.
Source: Namoï Cotton Co-operative Ltd.

This guide has been compiled with reference to the UNE Cotton Production course notes on cotton quality, and the Cotton Incorporated booklet, *The Classification of Cotton*. For further information, please see the CRDC and CottonInfo publication: *the Australian Cotton Production Manual*. Note: HVI is a registered trademark of Uster Technologies.