

Australian cotton quality - how good are we really?

By Roger Tomkins, Australian Cotton Shippers Association

The Australian cotton industry has long whistled to the tune that they produce the highest quality Upland cotton in the world. We know our growers are able to extract the highest average yields, something that has come with hard toil, ingenuity and a steady focus on research. Our seed breeders have also pushed germplasm capabilities to ensure our cotton fibre is as long and as strong as it can possibly be without it dampening their search for maximum yield.

Cotton quality is quite a wide-ranging feast, from freedom of contaminants and country damage through to colour, leaf and fibre properties. Some may even use the term 'quality' to describe ease and reliability of supply. Australian cotton is globally recognised for its freedom of contamination, its supply chain efficiencies and for its reliable long and strong fibre properties. But, in terms of fibre properties, are our main competitors catching up?

For the sake of this discussion, I will be comparing three main fibre properties being micronaire (a measure of the fibre thickness), fibre strength and fibre length. Measurement for these three characteristics is conducted using Uster HVI technology which is universally accepted as the proven method for rapidly testing raw cotton and therefore enabling it to comply with commercial applications. We will be reviewing Australian cotton's performance against three of its main global competitors being the growths Brazilian, EMOT (USA) and C/A (USA). USA production is split into the two growth areas being California and Arizona (C/A) and the rest of the growing regions (EMOT – Eastern, Memphis and Other Territories).

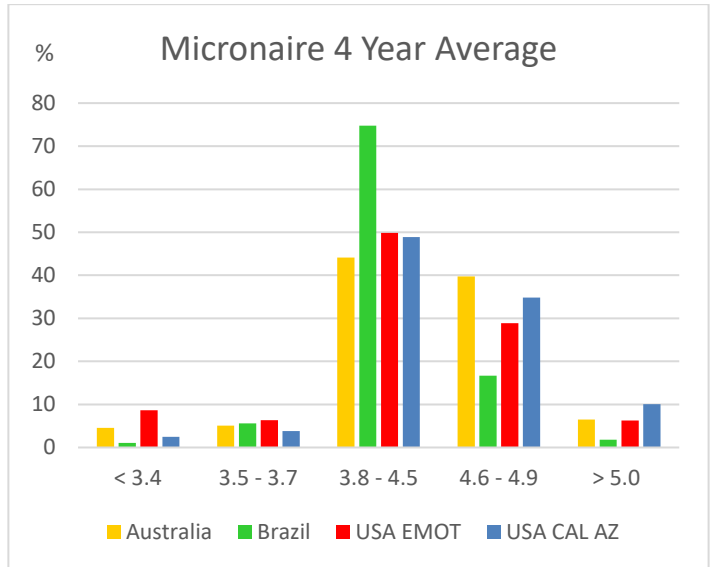
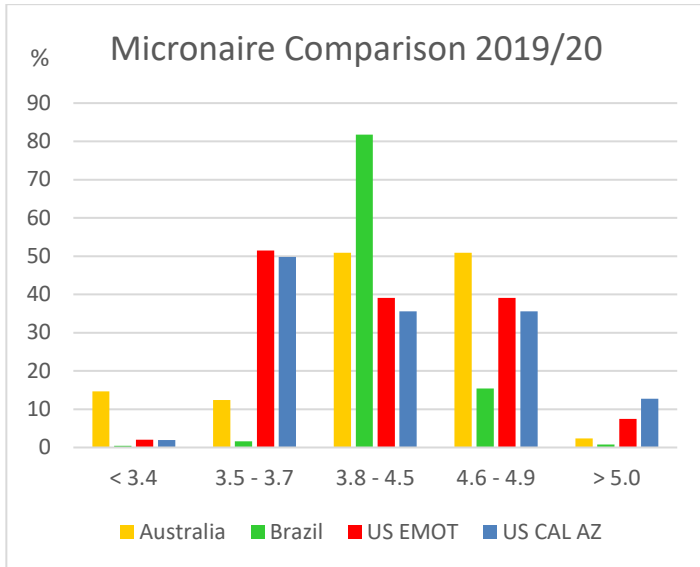
Micronaire

Micronaire testing is an imperfect measurement but one that is quick and repeatable. The test measures the resistance to air flow through a bundle of raw cotton and as such is an indirect measurement of fibre wall thickness (cotton fibre has a hollow core and under the microscope looks similar to a squashed pipe). As said, it is an imperfect test but under commercial operations it is all we have. It is implied that the thicker the fibre wall the more mature it is. This is not always the case but I will leave this can of worms for another debate. Environmental and farming practices can and will, impact micronaire results as will seed variety. Earlier fruit will have a higher micronaire reading however by the time a cotton sample is tested it will be made up of a mixture of fibre from across the plant and the field.

The micronaire result is an important tool for a spinning mill as it provides a strong indication as to how the resulting cotton yarn/material will absorb dye. Generally the higher the micronaire reading the more dye it will absorb. A spinning mill will endeavour to maintain an even average micronaire reading for each laydown (group of bales that cotton is drawn from at the beginning of the spinning process) to ensure that the material produced from the yarn will dye evenly.

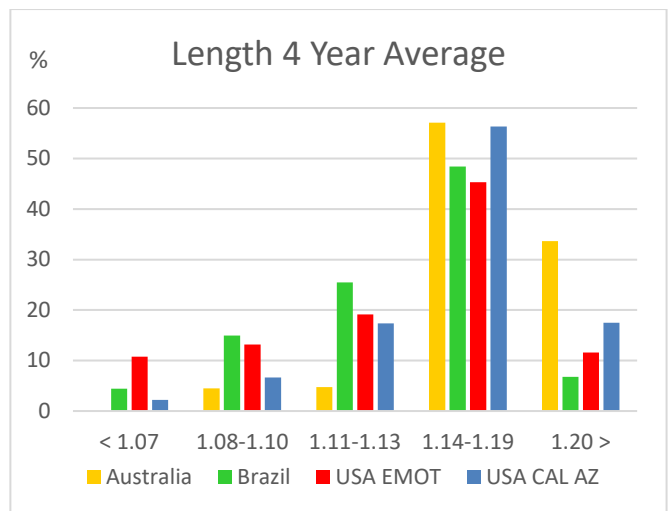
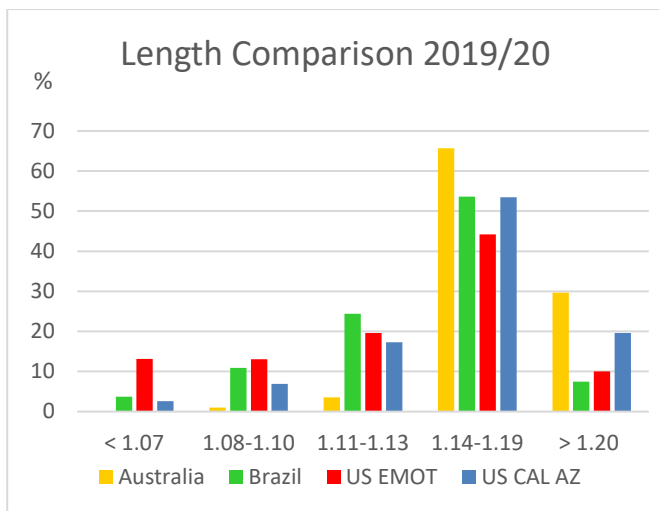
The graphs below show micronaire readings in commercially traded groupings across the four growths for the last completed season 2019/20 and the averaged results across the previous four seasons. The Australian results show a relatively wide micronaire spread likely as a result of the push south and north of our crop. The release this season (2020/21) of a higher micronaire variety should help in minimising the amount of lower micronaire cotton produced.

Brazilian cotton has the tightest micronaire spread with a lower average mic while Cal/Az typically produces a broader fibre. Over the four year average, EMOT showed the greatest spread in micronaire values likely as a result of its large and differing growing regions.

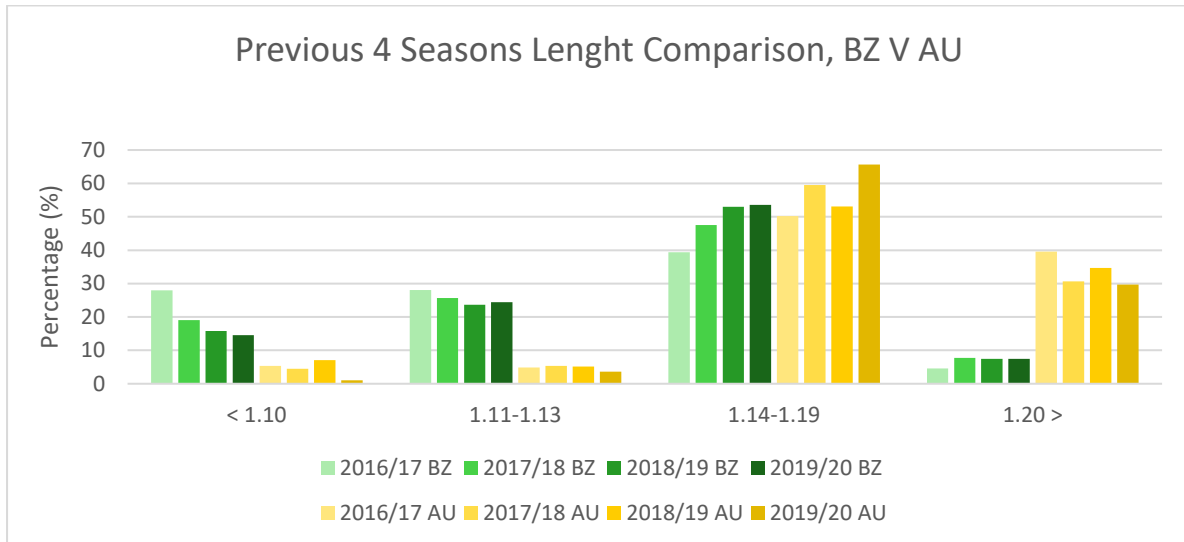


Fibre Length (Staple)

The length readings obtained on HVI machines are an average fibre length derived from a ribbon or beard of individual fibres. Typically these fibres, if measured individually, will produce a bell shaped curve of differing lengths however commercially we are assigning the length to cotton based off the upper half mean length of these fibre beards. Seed variety is instrumental in governing the true potential of fibre length. Growing conditions and nutritional availability during the critical period of fibre development, following flowering, will determine if the crop can reach its genetic capabilities. Of all the Upland cotton grown around the world Australian is the longest and has been so for many years. This is obvious in the below charts. In both the last season’s results and the average of the last four season’s crops, the length of Australian cotton significantly outperforms its competitors.



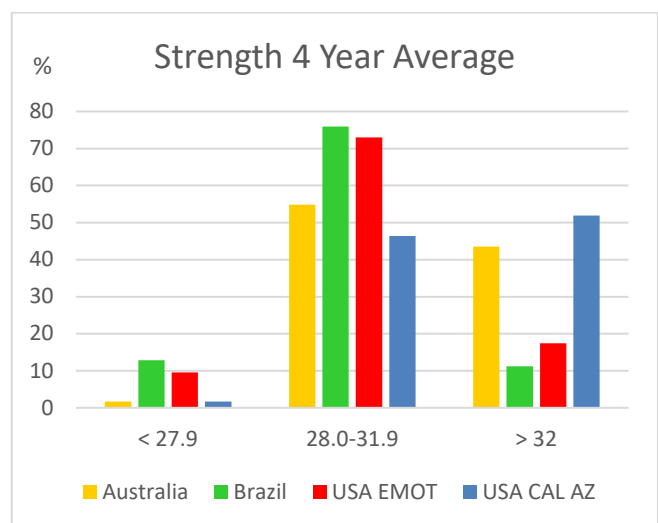
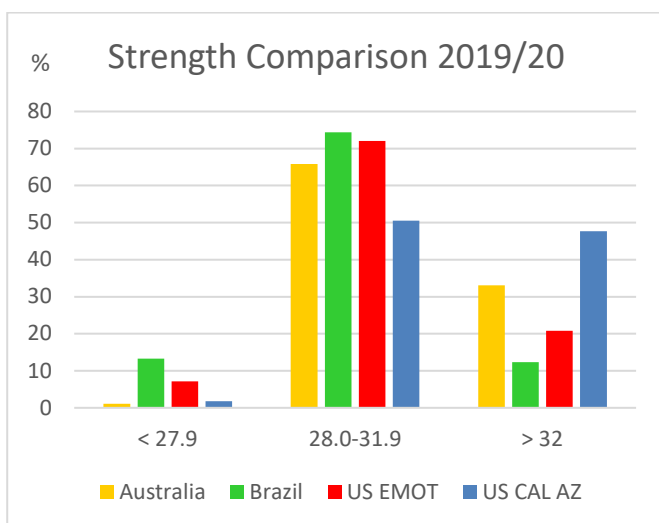
There is perhaps some evidence to suggest that the length of the Brazilian cotton is improving (refer to the below graph) however the data suggests it is still in a race with EMOT for producing the shortest staple of the four growths in question and it still has a long way to go before it can compete on length with Australian.



Fibre Strength (GPT)

Fibre strength is measured commercially as the tensile strength of a set bundle of fibres. Strength, in conjunction with length, is very important in the spinning process as collectively (along with length uniformity and other parameters) they will determine how fine a yarn can be spun from the raw cotton. A weaker fibre will require a greater overlap of fibres during the spinning process in order to obtain the desired yarn strength. This will result in a thicker yarn when finer is more desirable.

The reader will note from the two charts below that Australian cotton rates very highly in terms of strength although falling marginally behind Cal/Az it is well ahead of both EMOT and Brazilian.



What we must also consider is the sheer volume differences between these competing growths. Over the last four seasons the EMOT crop averaged nearly 18 million bales while Brazil produced over 12 million bales. The C/A is much smaller crop averaging just a little over six 600,000 480 lb bales while Australia averaged a tad over 2.2 million bales for the same period. This translates to Brazil producing on average around 1.3 million bales with strength readings over 32 GPT with the EMOT crop producing over 3 million bales. In comparison, while Australian cotton was markedly stronger than these two growths, our average production of cotton with strength over 32 GPT was only around 725,000 bales.

Complacency is never a good thing and luckily is a word our seed breeders are not familiar with. Australian varieties lead the world in terms of fibre length. A new variety was launched this season (2020/21) that will, if all goes to plan, help to reduce the amount of lower micronaire cotton produced in those heat unit challenged growing areas. From discussions with our seed breeding team we know that further improvements in strength are in the pipeline however this is not something that can be achieved overnight especially without it having a negative impact on yield.

Although the writer may be a tad biased, in terms of overall cotton quality, Australian remains in front of its competitors. The combination of our length and strength values when married up with our fast and reliable delivery capabilities make Australian cotton the fibre of choice for global finer count spinners. The cotton industry is much like a Formula One racing team. It takes a concerted effort from a huge team of players working frantically in the background to keep the one car firmly in the lead. It's more important than ever that we do not ease our foot off the accelerator. Team USA and Brazil are close behind us. They have a huge amount of power (gained from crop sizes four times or more than our own) and a pile of money (obtained from fixed grower marketing levies) to throw at the race.

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References:

- *USDA Agricultural Marketing Service, Annual Cotton Quality Reports*
- *ABRAPA, Programa Standard Brasil HVI, Jan 2021*
- *Australian Cotton Shippers Association, End Season Classing Statistics*