

THE IMPORTANCE OF GRADE VERSUS HIGH STRENGTH

Dennis G. Hughes - Australian Cotton Growers
Research Association

This subject is very relevant to the Australian Cotton Growing Industry as the most common complaint against our major seed variety, DPL 61, is that this growth has a lower breaking strength when it is produced in Australia, particularly in comparison with DPL 61 grown in Arizona, one of our keenest competitors in the South East Asia markets. The main virtue however, is that this variety, in Australia, produces high grades consistently, even in wet picking seasons, with the exception of the disastrous 1983 harvest, when much gray cotton was produced.

During the past twenty years many seed varieties have been tested in Australia with varied results for grade, staple, fineness, maturity and strength.

Some varieties produce high strength but are too low in grade, others give good grades but are too low in strength. One of the best varieties grown commercially in Australia has been the Namcala variety. This variety is superior to the ever popular San Joaquin Valley cotton for staple length and strength, unfortunately erratic yield performance has made it an unpopular variety in Australia.

The variety which has achieved the best results over the years has been the Delta Pine seed, supplying most of the needs of the markets in which we sell, along with highest yield per acre. However, this variety presents some problems in marketing, especially during years in which the growing season has been cool, resulting in lower micronaire and maturity ranges, such as with the 1984 crop.

The latest and most important challenge to cotton growers is the development of new textile machinery which requires increased strength in its cotton fibre requirements. These new machines have been developed to increase productivity and thereby reduce costs, however a loss in yarn strength is also produced which is forcing spinners to require a greater strength in their cotton fibre to compensate for this loss in yarn strength.

The most popular cotton spinning machine in use today, in all world markets

is the traditional ring-spinning machine which has been in use for over forty years. This machine uses the natural twist in cotton to produce a strong yarn. It is estimated that about ninety per cent of cotton yarns are produced on this system throughout the world.

The remaining ten per cent of yarns are spun on the 'open-end' or rotor system. The yarn from this system, if spun from similar quality cotton, produces a yarn which is about fifteen to twenty per cent weaker than yarn spun on ring spinning machinery. This rotor spinning is being followed by a new method, which is still in the experimental stage, called friction spinning, which is being promoted as a method to reduce spinning costs in comparison with rotor-spinning. Once again, however, a further reduction in yarn strength is being realised.

The following is re-produced from a presentation given to some American Spinners and Growers recently, and published by one of the leading textile machinery manufacturers of the world.

Cotton quality factors in order of importance relative to method of yarn production.

Ring Spinning

1. Fibre length and uniformity
2. Fibre Strength
3. Fibre fineness

PRESENT
MARKET

Rotor Spinning

1. Fibre strength
2. Fibre fineness
3. Fibre length and uniformity
4. Cleanliness

Friction Spinning

1. Fibre friction
2. Fibre strength
3. Fibre fineness
4. Fibre length and uniformity
5. Cleanliness

It can readily be seen that in the new spinning technologies fibre

strength is at the top of the list.

Before we rush off to produce high strength lower micronaire but mature cotton we should remember that ninety percent of our market is presently spun on ring-spinning machines. Rotor-spinning is not taking over at a fast pace so time is on our side.

Possibly, by the year 2000, friction spinning will be the main yarn spinning method, unless other methods are developed before then, but much needs to be learned over the coming years before we can be sure of this new development. The advent of these new machines should be followed closely.

It is apparent that stronger cottons are needed for rotor-spun yarns, together with finer but mature fibre. We are advised that the grade of cotton required for these open-end machines is not as important as strength, providing cleaners are incorporated in the equipment.

An acceptable quality is described as SLM 1", micronaire 3.5 to 3.9, with good maturity and a Pressley strength of 85,000 P.S.I. plus.

As stated earlier in this paper however, our main market is in the ring-spun yarns, most of which are blended with other cottons or fibres, requiring high grade cottons in the range of Middling to Strict Middling, sometimes even higher. Over the next ten years therefore, we should concentrate our efforts in producing a high grade cotton, in the regular micronaire range of 3.5 to 4.9, average 4.2, with a pressley range of 82,000 to 87,000 P.S.I.

If this can be achieved we will have no problems in supplying the markets with which we have worked so hard to establish.

Concentrate - DP - medium staple
increase strength for new spinning
technology.