

Fig. 1: The mechanical cotton harvesting methods currently in use are the spindle and the stripper methods.

Influence of the mechanical harvesting method on ring and rotor yarn up to the end product



Fig. 5 QR code for scanning and downloading the special print.

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In a joint cooperation between the Cotton Institute of South Africa and Rieter, the two commonly used methods of mechanical cotton harvesting were compared with each other. The comprehensive test and its results are available in a special print (see QR code for entire report). We are pleased to present some of the interesting extracts from the project.

Cotton is still the dominant staple fibre in Africa, and almost 1.4 million tons of cotton were produced 2013. That corresponds to about 5% of global production. In South Africa, approx. 9000 tons of cotton are harvested annually.

Test conditions

Two different methods of cotton harvesting were each examined at two different farms. The comparison was carried out through to the knitted fabric, whereby carded ring and rotor yarns with various counts were spun. Not only the yarns and knitted fabrics were tested but also interim products, to be able to better interpret the effects on the yarn and the knits.

Mechanical harvesting methods

Today there are two common mechanical methods for harvesting cotton – the spindle method and the stripper method. (Fig. 1).

These two methods differ in productivity and quality. The stripper method has many advantages, such as lower investment costs, lower fuel consumption and higher harvest yields, which, however, can increase the proportion of immature fibres. Also known is

that the cotton harvested with the stripper picker exhibits a higher seed coat content. (Fig. 2).

Fibre length

The fibre length, in particular, short fibre ratio and mean fibre length, have a strong influence on the yarn unevenness.

Across the process line, a mean staple 1 to 2 mm longer is seen with the spindle method compared to the stripper method.



Fig. 2 The cotton harvested by the spindle method (left) contains fewer trash particles than the cotton harvested by the stripper method (right).

Thus, as far as evenness is concerned, a positive result in the yarn and in the knitted fabric is also to be expected. Also decisive here is, however, how great the influence is of the two yarn structures, ring, and rotor as seen in the figure.(Fig.3).

Yarn quality

The quality criteria of the ring yarn show that the spindle method gives somewhat better yarn results than the stripper method. With rotor yarn, no evident differences between the two harvesting methods are detectable.

Knitted fabric comparisons

The knitted fabrics made of rotor yarn have a far better evenness than those made of ring yarn. This means that the influence of the end spinning system on the knitted fabric quality is far higher than the influence of the harvesting method. Nevertheless, the positive influence of the spindle method, at least with one farmer, is recognizable even in knitted fabric made of rotor yarn (Fig. 4).

Comprehensive information in the special print

The special print includes the complete, comprehensive data and detailed explanations and background information. It can be ordered under rieter-link@rieter.com. Electronically, the special print can be downloaded with the given QR code (Fig.5).◆

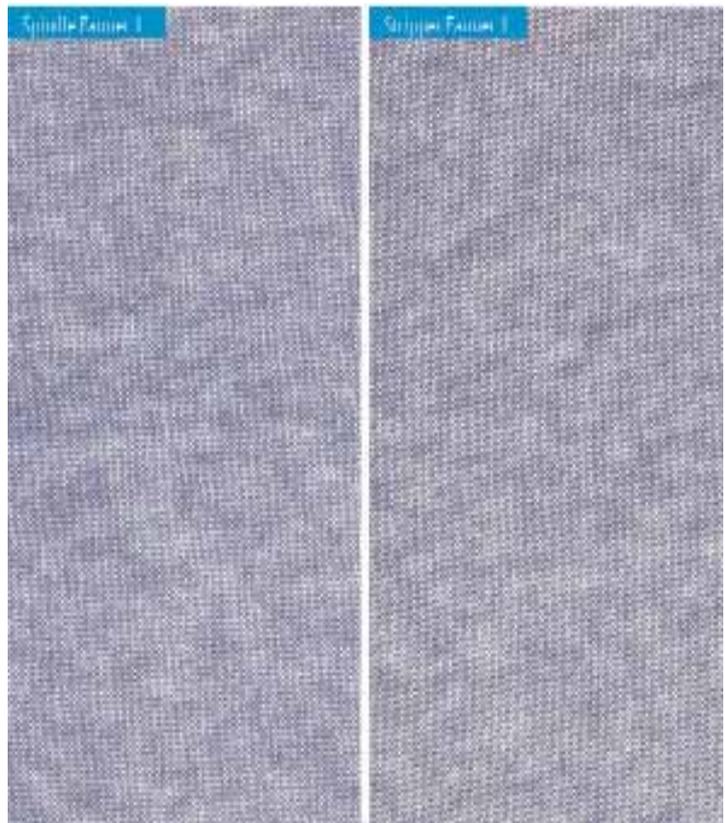


Fig. 4: Knits from rotor yarn, 100% cotton, Ne 24, 4.2 ae.

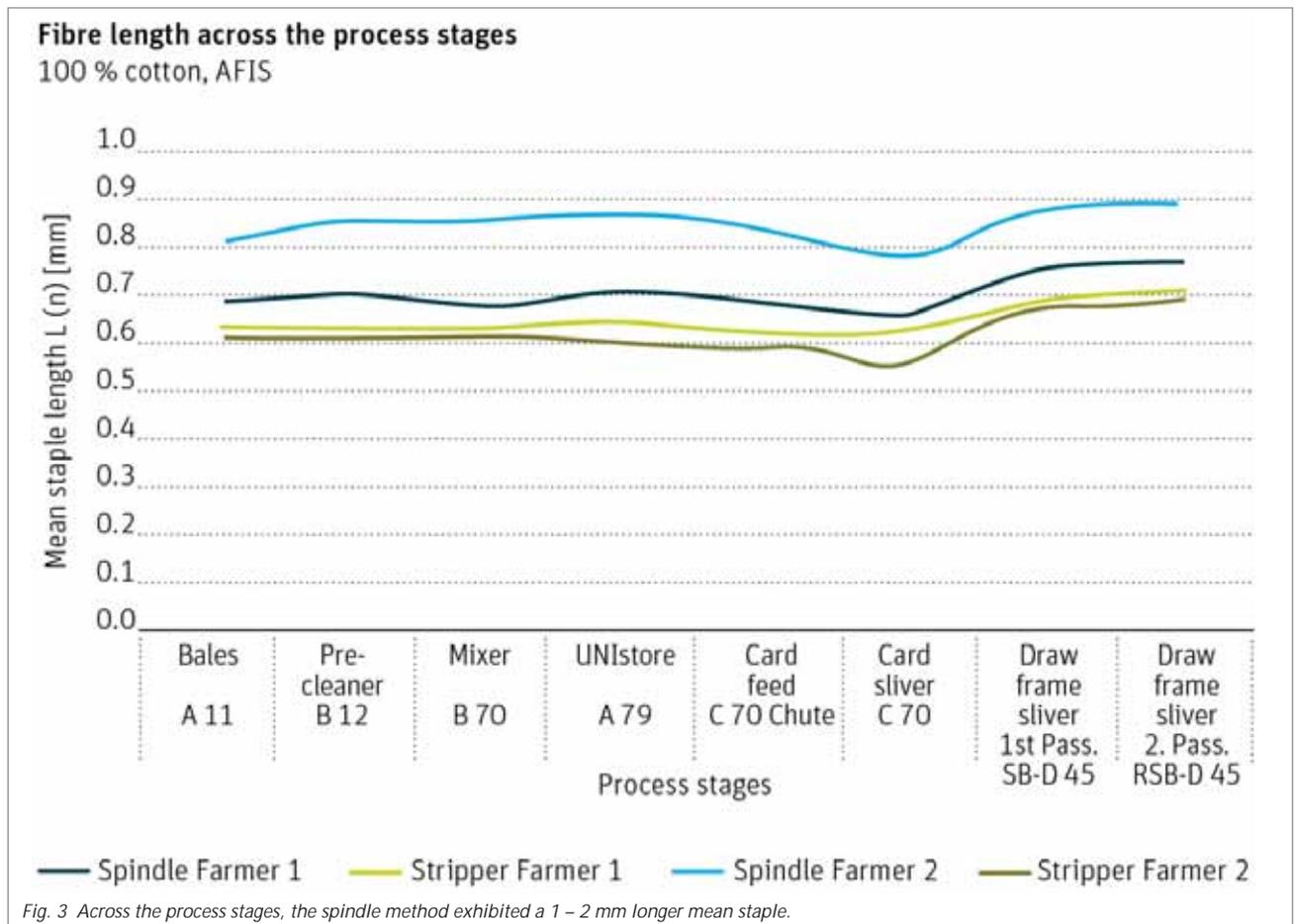


Fig. 3 Across the process stages, the spindle method exhibited a 1 – 2 mm longer mean staple.