

MASTER WEAVER

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COTTON

Several plants, all belonging to the same genus "Gossypium", have their seeds covered with fibers which can be used for spinning. Although they are of the same genus, the plants do not look the same at all. The smallest grow in Egypt, Arabia, Persia and China. These plants are only about 2 or 2½ feet tall. The cotton grown in North America is more of a shrub up to 5 feet high. In India it looks more like a tree of a medium size from 10 feet up.

History. Cotton was probably known and used in China as early as 2000 BC, but it was never very popular there. It was also well known in India at about 1000 BC. It was imported to Greece in the 5-th century BC, but its cultivation did not start in the eastern Mediterranean until 300 BC. In the first century BC cotton was used in Rome but not cultivated yet.

Although there were attempts to grow cotton on European soil in the 2-nd century AD, it took eight more centuries to establish cotton cultivation in Spain and Italy, and another five before it reached Balkan countries

Northwestern Europe (France, England) started importing cotton about 1200 AD. It was probably spun and woven for the first time in Germany in 1300.

In 1492 the first cotton is brought to Europe from Bahamas, and in 1520 - from Brazil. In the 16-th century cotton is spun and woven in France on a large scale, but the cotton industry did not reach England until the beginning of the 17-th. At about the same time (1619) the first cotton is grown in Virginia, from where its culture spreads all over the South.

In 1700 England tries to protect their wool industry by forbidding the use of cotton, but this law is repelled 36 years later.

The first cotton has been exported from North America in 1753. In 1800 the total production of cotton in United States was about one thousand tons, of which one hundred was exported. The present production in USA is more than 3 million tons - half of the total world production.

There is no doubt that cotton has been cultivated, spun and woven in Central and South America for centuries before the first white colonists, but the chronology of events in this part of the world is extremely uncertain, and we can only surmise that cotton could be grown there even before the Christian era.

Physical properties. The quality of cotton depends on the length of fibers. The longest fibers of nearly 2" has the Sea Islands cotton. Then comes Egyptian variety with fibers about 1½", then the American cotton (around 1"), and finally the Indian cotton of lowest quality and with shortest fibers (½" to 1"). There is a strange

relationship between the size of the plant and the quality of the fibers: the taller the plant the poorer the cotton.

In America the best is probably the Gulf Cotton grown in the States around the Gulf of Mexico.

The thickness or diameter of cotton fibers does not change as much as their length - it is always around 7 or 8 ten thousandth of an inch.

The cotton fibers are flat and twisted. The colour of American cotton is white; Egyptian is yellowish, and Indian - greyish.

Cotton has lower tensile strength (resistance to breaking) than silk, ramie, or linen of the same size. But it is stronger than wool. Damp cotton is stronger than dry cotton. It has a very high resistance to friction, and it is quite elastic (6 - 7%)

The count of cotton is based on No.1 being 840 yards long. A higher number indicates how many times the yarn is finer. For instance No.300 has about 150 miles of yarn in one pound. In metric system the number indicates the meters in one gram of yarn. To convert the number of cotton in metric system into the English one, we multiply the former by .59.

Chemical properties. The chemical composition of cotton:

Fiber	83.7 %	Mineral ash	1.7 %
Water	6.8 %	Protein	1.5 %
Nitrogen	5.8 %	Fat5 %

Cotton does not dissolve in concentrated caustic soda (NaOH), nor in saturated hot solution of soda (NaCO₃), but it dissolves in acids.

Processing of fibers. When cotton is picked the fibers stick to the seeds, and they constitute only about 30% (by weight) of the whole crop. Thus the first operation after picking is to separate the fibers from the seeds. This is called Ginning. The fibers are carded before spinning, but exceptionally good cotton is often combed as well. The best cotton can be spun into a very fine yarn - as fine as No.450. Egyptian cotton - up to No.90. Indian cotton only up to No.20.

Mercerizing. If a cotton thread or finished cotton fabric is treated with cold saturated solution of caustic soda, it changes its appearance and its properties as well. The fibers swell to the point of becoming cylindrical. There is a considerable shrinkage, but since the mercerization is done when the threads are stretched, this shrinkage results in straightening of all fibers. At the same time the fibers become half-transparent and shiny. In result we have yarn which is smoother, more shiny, heavier, and stronger than plain cotton.

Besides mercerizing there are other methods of improving the appearance of cotton. It can be glazed with wax and glue. It can be treated with diluted nitric acid to resemble wool, or with solution of fibroin to make it look like silk.
