

WHAT IS COTTON?



WHAT IS COTTON?:

COTTON is defined as white fibrous substance covering seeds harvested from Cotton Plant.

SEED COTTON (called Kapas in India - Paruthi in Tamil) harvested from Cotton Plant.

LINT COTTON (RUIA in Hindi, PANJU in Tamil) is obtained by removing the seeds in a ginning machine.

LINT COTTON is spun into Yarn, which is woven or knitted into a Fabric. Researchers have found that cotton was grown more than 9000 years ago. However large scale cultivation commenced during middle of 17th Century AD.

Many varieties of Cotton are cultivated mainly from 3 important genetic species of Gossipium.

G. HIRSUTUM - 87% Grown in America, Africa, Asia, Australia Plant grows to a height of 2 Meters.

G. BARBADENSE- 8% Grown in America, Africa & Asia. Plant grows to a height of 2.5 Meters with yellow flowers, long fibers with good quality, fibers with long staple and fineness

G. Arboreum - 5% Perennial plant grows up to 2 meters with red flowers, poor quality fibers in East Africa and South East Asia.

There are four other species grown in very negligible quantities. Cotton harvested from the Plant by hand - picking or machine picking is ginned to remove seeds and the lint is pressed into Bales for delivery to Spinning Mills. Cotton is Roller Ginned (RG) or Saw Ginned (SG) depending varieties and ginning practices.

Cotton is cultivated in 75 Countries with an area of 32 Million Hectares. Cultivation period varies from 175 days to 225 days depending on variety. Cotton is harvested in two seasons, summer and winter seasons.

Saw ginned cotton is more uniform and cleaner than Roller Ginned Cotton. But fibers quality is retained better quality in Roller Ginning than Saw Ginning which has high productivity.

Cotton Fiber is having a tubular structure in twisted form. Now, researchers have developed coloured cotton also. As on date, percentage of Cotton fiber use is more than synthetic fibers. But, its share is gradually reducing. Cotton is preferred for under garments due its comfort to body skin. Synthetics have more versatile uses and advantage for Industrial purposes.

PROPERTIES OF COTTON

No other material is quite like cotton. It is the most important of all natural fibres, accounting for half of all the fibres used by the world's textile industry.

Cotton has many qualities that make it the best choice for countless uses:

Cotton fibres have a natural twist that makes them so suitable for spinning into a very strong yarn.

The ability of water to penetrate right to the core of the fibre makes it easy to remove dirt from the cotton garments, and creases are easily removed by ironing.

Cotton fabric is soft and comfortable to wear close to skin because of its good moisture absorption qualities.

Charges of static electricity do not build up readily on the clothes.

HISTORY OF COTTON

Nobody seems to know exactly when people first began to use cotton, but there is evidence that it was cultivated in India and Pakistan and in Mexico and Peru 5000 years ago. In these two widely separated parts of the world, cotton must have grown wild. Then people learned to cultivate cotton plants in their fields.

In Europe, wool was the only fiber used to make clothing. Then from the Far East came tales of plants that grew "wool". Traders claimed that cotton was the wool of tiny animals called Scythian lambs, that grew on the stalks of a plant. The stalks, each with a lamb as its flower, were said to bend over so the small sheep could graze on the grass around the plant. These fantastic stories were shown to be untrue when Arabs brought the cotton plant to Spain in Middle Ages.

In the fourteenth century cotton was grown in Mediterranean countries and shipped from there to mills in the Netherlands in western Europe for spinning and weaving. Until the mid eighteenth century, cotton was not manufactured in England, because the wool manufacturers there did not want it to compete with their own product. They had managed to pass a law in 1720 making the manufacture or sale of cotton cloth illegal. When the law was finally repealed in 1736, cotton mills grew in number. In the United States though, cotton mills could not be established, as the English would not allow any of the machinery to leave the country because they feared the colonies would compete with them. But a man named Samuel Slater, who had worked in a mill in England, was able to build an American cotton mill from memory in 1790.

GROWING THE COTTON

Cotton plant's leaves resemble maple leaves and flowers look very much like pink mallow flowers that grow in swampy areas. They are relatives and belong in the same plant family.

Cotton is grown in about 80 countries, in a band that stretches around the world between latitudes 45 North to 30 South. For a good crop of cotton a long, sunny growing season with at least 160 frost-free days and ample water are required. Well drained, crumbly soils that can keep moisture well are the best. In most regions extra water must be supplied by irrigation. Because of it's long growing season it is best to plant early but not before the sun has warmed the soil enough.

Seedlings appear about 5 days after planting the seeds. Weeds have to be removed because they compete with seedlings for water, light and minerals and also encourage pests and diseases. The first flower buds appear after 5-6 weeks, and in another 3-5 weeks these buds become flowers.

Each flower falls after only 3 days leaving behind a small seed pot, known as the boll. Children in cotton-growing areas in the South sometimes sing this song about the flowers:

First day white, next day red,
third day from my birth - I'm dead.

Each boll contains about 30 seeds, and up to 500 000 fibres of cotton. Each fibre grows its full length in 3 weeks and for the following 4-7 weeks each fiber gets thicker as layers of cellulose build up the cell walls. While this is happening the boll matures and in about 10 weeks after flowering it splits open. The raw cotton fibres burst out to dry in the sun. As they lose water and die, each fibre collapses into what looks like a twisted ribbon. Now is time for harvesting. Most cotton is hand-picked. This is the best method of obtaining fully grown cotton because unwanted material, called "trash", like leaves and the remains of the boll are left behind. Also the cotton that is too young to harvest is left for a second and third picking.

A crop can be picked over a period of two months as the bolls ripen. Countries that are wealthy and where the land is flat enough usually pick cotton with machines - cotton harvesters.

GLOBAL COTTON - VARIETIES - PLANTING AND HARVESTING PERIODS

SNo	Country	Planting Period	Harvesting	Staple-mm	Mike	Variety
1	AFGHANISTAN	APRIL-MAY	OCT-DEC	26-28	4.0	ACALA

2	ARGENTINA	SEPT-OCT	FEB-JUNE	24-28	3.9-4.1	TOBA
3	AUSTRALIA	SEPT-NOV	MAR-JUNE	24-29	3.2-4.9	DPL
4	BRAZIL	OCT-NOV	MAR-JUNE	26-28	3.2-4.0	IAC
	BRAZIL	PERENNIAL		32-35	3.2-4.8	MOCO
5	BURKIN	JUNE-JULY	NOV-DEC	25-28	3.6-4.8	ALLEN
6	CAMERRON	JUNE	NOV-DEC	25-28	3.8-4.3	ALLEN
7	CENTRAL AFRICA	JUN-JULY	NOV-DEC	25-28	3.8-4.2	ALLEN
8	CHAD	JUNE	NOV-DEC	25-28	3.8-4.4	ALLEN
9	CHINA	APRIL-JUNE	SEP-OCT	22-28	3.5-4.7	SHANDONG
						XINJIANG
						MNH-93
10	COTED IVORIE	JUN-AUG	OCT-JAN	24-28	2.6-4.6	ALLEN
11	EGYPT	MARCH	SEP-OCT	31-40	3.2-4.6	GIZA
12	GREECE	APRIL	SEPT-OCT	26-28	3.8-4.2	4S
13	INDIA	APRIL-NOV	SEP-NOV	16-38	2.8-7.9	SEPARATE LIST
	INDIA	SEPT-NOV	FEB-APR			
14	IRAN	MAR-APR	SEP-NOV	26-28	3.9-4.5	COKER
15	ISRAEL	APRIL	SEP-OCT	26-37	3.5-4.3	ACALA
						PIMA
16	KAZAKSTAN	APR-MAY	SEP-NOV			
17	MALI	JUN-JUL	OCT-NOV	26-27	3.7-4.5	BJA
18	MEXICO	MAR-JUNE	AUG-DEC	26-29	3.5-4.5	DELTAPINE
19	MOZAMBIQUE	NOV-DEC	APR-MAY	25-29	3.6-4.2	A637
20	NIGARIA	JUL-AUG	DEC-FEB	24-26	2.5-4.0	SAMARU
21	PAKISTAN	APR-JUN	SEP-DEC	12-33	3.5-6.0	
22	PARAGUAY	OCT-DEC	MAR-APR	26-28	3.3-4.2	EMPIRE
23	PERU	JUL-NOV	FEB-AUG	29-8	3.3-4.2	TANGUIS
						PIMA
24	SPAIN	APR-MAY	SEP-NOV	25-28	3.3-4.9	CAROLINA
25	SUDAN	AUG	JUN-APR	27-E0	3.8-4.2	BARAKAT
						ACALA
26	SYRIA	APR-MAY	SEP-NOV	25-29	3.8-4.8	ALEPPO
27	TAZIKSTAN	APR-MAY	SEP-NOV			
28	TOGO	JUN-JUL	NOV-DEC	28-29	4.3-5.5	ALLEN
29	TURKMENISTAN	APR-MAY	SEP-NOV	24-29	3.5-5.5	DELTAPINE
						COKER
30	TURKEY	APR-MAY	SEP-NOV	24-28	3.5-5.5	DELTAPINE
31	UGANDA	APR-JUN	NOV-FEB	26-28	3.3-4.8	BAP-SATU
32	UZBEKISTAN	APR-MAY	SEP-NOV	24-41	3.5-4.7	
33	USA	APR-MAY	SEP-DEC	26-40	3.8-4.5	VARIETIES
				28-30	3.0-4.0	ACALA 151T
				28-29	3.8-4.6	DELTAPINENC
				25-28	3.2-4.6	PAYMASTER 280
				27-28	3.7-4.7	STONOVILLE ST
				35-40	3.5-4.5	PIMA S7
34	YEMEN	AUG-SEP	JUN-APR	36-40	3.5-4.9	K4

COTTON AND YARN QUALITY CO-RELATION:

Instead of buying any cotton available at lowest price, spinning it to produce yarn of highest count possible and selling Yarn at any market in random, it is advisable to locate a good market where Yarn can be sold at highest price and select a Cotton which has characteristics to spin Yarn of desired specifications for that market.

ESSENTIAL CHARACTERISTICS of cotton quality and characteristics of Yarn quality of Yarn are given from detailed experimental investigations. Some of the important conclusions which help to find co-relation between Yarn quality and Cotton quality are given below

STAPLE LENGTH: If the length of fiber is longer, it can be spun into finer counts of Yarn which can fetch higher prices. It also gives stronger Yarn.

STRENGTH : Stronger fibers give stronger Yarns. Further, processing speeds can be higher so that higher productivity can be achieved with less end-breakages.

FIBER FINENESS: Finer Fibers produce finer count of Yarn and it also helps to produce stronger Yarns.

FIBER MATURITY : Mature fibers give better evenness of Yarn. There will be less end - breakages . Better dyes' absorbency is additional benefit.

UNIFORMITY RATIO: If the ratio is higher. Yarn is more even and there is reduced end-breakages.

ELONGATION :A better value of elongation will help to reduce end-breakages in spinning and hence higher productivity with low wastage of raw material.

NON-LINT CONTENT: Low percentage of Trash will reduce the process waste in Blow Room and cards. There will be less chances of Yarn defects.

SUGAR CONTENT: Higher Sugar Content will .create stickiness of fiber and create processing problem of licking in the machines.

MOISTURE CONTENT : If Moisture Content is more than standard value of 8.5%, there will be more invisible loss. If moisture is less than 8.5%, then there will be tendency for brittleness of fiber resulting in frequent Yarn breakages.

FEEL : If the feel of the Cotton is smooth, it will be produce more smooth yarn which has potential for weaving better fabric.

CLASS : Cotton having better grade in classing will produce less process waste and Yarn will have better appearance.

GREY VALUE: Rd. of calorimeter is higher it means it can reflect light better and Yam will give better appearance.

YELLOWNESS : When value of yellowness is more, the grade becomes lower and lower grades produce weaker & inferior yarns.

NEPPINESS : Neppiness may be due to entanglement of fibers in ginning process or immature fibers. Entangled fibers can be sorted out by careful processing But, Neps due to immature fiber will stay on in the end product and cause the level of Yarn defects to go higher.

An analysis can be made of Yarn properties which can be directly attributed to cotton quality.

1. **YARN COUNT**: Higher Count of Yarn .can be produced by longer, finer and stronger fibers.

2. **C.V. of COUNT**: Higher Fiber Uniformity and lower level of short fiber percentage will be beneficial to keep C.V.(Co-efficient of Variation) at lowest.

3. **TENSILE STRENGTH** : This is directly related to fiber strength. Longer Length of fiber will also help to produce stronger yarns.

4. **C.V. OF STRENGTH** : is directly related CV of fiber strength.

5. **ELONGATION** : Yam elongation will be beneficial for weaving efficiently. Fiber with better elongation have positive co-relation with Yarn elongation.

6. **C.V. OF ELONGATION**: C.V. of Yarn Elongation can be low when C.V. of fiber elongation is also low.

7. **MARS VARIATION** : This property directly related to fiber maturity and fiber uniformity.

8. **HAIRINESS** : is due to faster processing speeds and high level of very short fibers,

9. **DYEING QUALITY** : will depend on Evenness of Yarn and marketing of cotton fibers.

10. **BRIGHTNESS** : Yarn will give brighter appearance if cotton grade is higher.

COTTON QUALITY SPECIFICATIONS:

The most important fiber quality is Fiber Length
Length

Staple classification	Length mm	Length inches	Spinning Count
Short	Less than 24	15/16 -1	Coarse Below 20
Medium	24- 28	1.1/132-1.3/32	Medium Count 20s-34s
Long	28 -34	1.3/32 -1.3/8	Fine Count 34s - 60s
Extra Long	34- 40	1.3/8 -1.9/16	Superfine Count 80s - 140s

Notes:

Spinning Count does not depend on staple length only. It also depends on fineness and processing machinery.

Length is measured by hand stapling or Fibrograph for 2.5% Span Length

2.5%SL (Spun Length) means at least 2.5% of total fibers have length exceeding this value.

50% SL means at least 50% of total fibers have length exceeding this value.

LENGTH UNIFORMITY

Length Uniformity is Calculated by $50SL \times 100 / 2.5 SL$

Significance of UR (Uniformity Ratio) is given below:

UR% Classification 50-55

Very Good 45-50 Good 40-45

Satisfactory 35-40

Poor Below 30 Unusable

M= 50% SL

UHM SL - Average value of length of Longest of 50% of Fibers

UI Uniformity Index

UI M/UHM

Interpretation of Uniformity Index

U.INDEX	CLASSIFICATION	UHM	CLASSIFICATION
Below 77	Very low	Below 0.99	Short
77-99	Low	0.99-1.10	Medium
80-82	Average	1.11-1.26	Long
83-85	High	Above 1.26	Extra Long
Above 85	Very High		

Now Uniformity is measured by HVI

Fiber Strength

Fiber Strength, next important quality is tested using Pressley instrument and the value is given in Thousands of Pounds per Square inch. (1000 psi) For better accuracy, Stelometer is used and results are given in grams / Tex.

Lately, strength is measured in HVI (High Value Instrument) and result is given in terms of grams/tex.

Interpretation of Strength value is given below

G/tex	Classification
Below 23	Weak
24-25	Medium
26-28	Average
29-30	Strong
Above 31	Very Strong

Strength is essential for stronger yarns and higher processing speeds.

Fiber Fineness Fiber Fineness and maturity are tested in a conjunction using Micronaire Instrument.

Finer Fibers give stronger yarns but amenable for more neppiness of Yarn due to lower maturity.

Micronaire values vary from 2.6 to 7.5 in various varieties.

FINENESS AND MATURITY

Usually Micronaire value is referred to evaluate fineness of Cotton and its suitability for spinning particular count of Yarn. As the value is a combined result of fineness and maturity of Cotton fiber, it cannot be interpreted, property for ascertaining its spinning Value. This value should be taken in conjunction with standard value of Calibrated Cotton value.

The following table will explain that micronaire value goes up along with maturity but declines with thickness of fiber. An Egyptian variety of Cotton, three samples of High maturity. Low maturity and Medium maturity were taken and tested. Test results are given below,

Maturity	Micronaire	Perimeter	Maturity	Maturity Ratio
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High	4.3	52.9	85.1	1.02
Medium	4.0	54.4	80.1	0.96
Low	3.9	54.7	79.3	0.95

Micronaire Value of 3.8 is higher than 3.2 of low maturity cotton. Another American Cotton was tested and results are as follows

High	4.1	64.4	75.9	0.87
Medium	3.4	62.1	68.0	0.80
Low	2.7	59.8	56.1	0.67

Hence, it is essential to know what Micronaire value is good for each variety of Cotton.

Maturity Ratio	Classification
1.00 and above	Very Mature
0.95 - 1.0	Above Average
0.85 - 0.95	Mature
0.80 - 0.85	Below Average
Less than 0.80	immature

COTTON GRADE

Cotton grade is determined by evaluating colour, leaf and ginning preparation. Higher grade cottons provide better yarn appearance and reduced process waste. Colour is determined by using Nickerson-Hunter Calorimeter. This gives values Rd (Light or Dark) and +b (Yellowness).

AMERICAN UPLAND COTTONS ARE CLASSIFIED ACCORDING TO GRADES AS GIVEN BELOW

WHITE COLOUR

S.NO	GRADE	SYMBOL	CODE
1	GOOD MIDDLING	GM	11
2	STRICT MIDDLING	SM	21
3	MIDDLING	M	31
4	STRICT LOW MIDDLING	SLM	41
5	LOW MIDDLING	LM	51
6	STRICT GOOD ORDINARY	SGO	61
7	GOOD ORDINARY	GO	71
8	BELOW GRADE		

Similar grading is done for Light Spotted, Spotted, Tinged and Yellow Stained Cottons. PIMA cottons are graded 1 to 9

HOW TO BUY COTTON?

COTTON BUYING is the most important function that will contribute to optimum profit of a Spinning Mill.

EVALUATION of cotton quality is generally based more on experience rather than scientific testing of characteristics only.

TIMING of purchase depends on comprehensive knowledge about various factors which affect the prices.

CHOOSING the supplier for reliability of delivery schedules and ability to supply cotton within the prescribed range of various parameters which define the quality of Cotton.

BARGINING for lowest price depends on the buyer's reputation for prompt payment and accept delivery without dispute irrespective of price fluctuations.

ORGANISING the logistics for transportation of goods and payment for value of goods will improve the benefits arising out of the transaction.

PROFIT depends on producing high quality Yarn to fetch high prices. Influence of quality of raw material is very important in producing quality Yarn. But, quality of yarn is a compound effect of quality of raw material, skills of work-force, performance of machines, - process know-how of Technicians and management expertise.

A good spinner is one who produces reasonably priced yarn of acceptable quality from reasonably priced fiber. Buying a high quality, high priced cotton does not necessarily result in high quality Yarn or high profits.

GUIDELINES FOR COTTON CONTRACTS:

Buyer and seller should clearly reach correct understanding on the following factors.

- Country of Origin, Area of Growth, Variety, Crop year
- Quality - Based on sample or Description of grade as per ASTM standard or sample For grade only and specifying range of staple length, Range of Micronaire, range of Pressley value, uniformity, Percentage of short fiber, percentage of non-lint content, Tolerable level of stickiness
- Percentage of Sampling at destination
- Procedure for settling disputes on quality or fulfillment of contract obligations.
- Responsibility regarding contamination or stickiness.
- Price in terms of currency, Weight and place of delivery.
- Shipment periods
- Certified shipment weights or landing Weights
- Tolerances for Weights and Specifications
- Port of Shipment and port of destination, partial shipments allowed or not, transshipment allowed or not, shipments in containers or Break-bulk carriers
- Specifications regarding age of vessels used for shipment, freight payment in advance or on delivery
- Responsibility regarding Import & Export duties
- Terms of Insurance cover

14. Accurate details of Seller, Buyer and Broker

15. Terms of Letter of Credit regarding bank negotiation, reimbursement and special conditions, if any

Choose Correct Supplier or Agent:

Apart from ensuring correct terms of Contract, Buyer should ensure that purchase is made from Reliable Supplier or through a Reliable Agent. Some suppliers evade supplies under some pretext if the market goes up. Otherwise, they supply inferior quality Either way buyer suffers.

By establishing long term relationship with reliable Suppliers, Buyers can have satisfaction of getting correct quality, timely deliveries and fair prices.

CHOOSING SUPPLIER:

It is good to establish long term relationship with a few Agents who represent reputed Trading Companies in various Cotton Exporting Countries. They usually give reliable market information on quality, prices and market trends so that buyer can take intelligent decision. As cotton is not a manufactured Commodity, it is good to buy from dependable suppliers, who will ensure supply of correct quality with a variation within acceptable limits at correct price and also deliver on due date.

CHOOSING QUALITY:

In a market with varying market demand situation. Buyers should decide which counts of Yarn to spin. Buyer can call for samples suitable for spinning Yarn counts programmed for production. Many spinners plan to do under-spinning. For Example, cotton suitable for 44s is used for spinning 40s. Some spinners do over-spinning. They buy cotton suitable for 40s and spin 44s count. But, is advisable to spin optimum count to ensure quality and also keep cost of raw material at minimum level as far as possible. Some spinners also buy 2 or more varieties and blend them for optimum spinning. For this purpose, a good knowledge to evaluate cotton quality and co-relate with yarn properties of required specifications. Cotton buyer should develop expertise in assessing cotton quality. Machine tests must be done only to confirm manual evaluation.

TAKING RIGHT OPTION:

It is not advisable just to look at price quoted by supplier. Correct costing should be done to work out actual cost when the cotton arrives at Mills. Further lowest price does not always mean highest profit for buying. Profitability may be affected by anyone or more of the following factors.

If the trash is higher, more waste will be produced reducing the Yarn out- turn and hence profit.

If the uniformity is less, end - breakages will be more reducing productivity and profitability.

If grade is poor or more immature fibers are found in cotton, the yarn appearance will be affected and Yarn will fetch lesser price in the market.

If the transit period for transport of cotton is longer, then also profitability will be reduced due blocking of funds for a longer period and increased cost of Interest.

Rate of Sales Tax varies from State to State. This must be taken in to account.

Hence, thorough costing should be worked out before deciding on the quoted price only

The margin of profit in spinning cotton should be calculated before deciding on The various options available depending on market conditions should be studied.

The factors to be considered for taking options are as follows.

Count for which demand is good in market

Prices for various counts for which demand exists.

Cost of manufacturing various counts.

Adequacy of machinery for the selected count.

Various varieties of cotton available for spinning the selected count.

Profit margin for each count using different varieties.

Price quoted by different Agents for same variety of selected cotton.

Reliability of supplier for quality and timely delivery.

Cost Consideration:

Apart from the price quoted by the seller, other incidental costs must be taken into consideration before buying.

a) Duration for goods to reach Buyer's godown from the seller's Warehouse. If the duration is longer, buyer will incur higher interest charges.

b) Cost of Transportation and taxes.

Resolution of differences

If any discrepancy arises in the quality, weight and delivery periods, sellers should be willing to resolve the differences amicably and quickly. In case the matter is referred to Arbitrator, the award of the Arbitrator must be immediately enforced.

Bench Marks for Easy Reference

It is better if quality bench marks are established for different varieties so that buying decisions are easy for buyers Following standards have been found to be appropriate for Strict Middling Grade Cotton of staple 1.3/32".

Staple Length (2.5% Spun Length) - Minimum 1.08" or 27.4 mm

Micronaire : Minimum 3.8, Maximum-4.6 Variation within bulk sample should not be more than _ 0.1

Colour : Rd not less than 75 not more than 10

Nep Content: Less than 150 per gram

Strength : More than 30 grams/tex

Length Uniformity Ratio: Not less than 85%

Elongation : More than 8%

Short Fiber Content: Less than 5%

Seed Count Fragments : Less than 15 per grams

Commercial Bench marks can be given as follows:

Price Competitiveness

Price Stability

Easy Availability throughout year

Uniform Classing and Grading system

Even- running Cotton in all Characteristics

Reliable deliveries or Respect for sanctity of contract.

QUALITY EVALUATION:

The need for quality evaluation is for following purposes

a) To get optimum quality at lowest price.

b) To decide whether cotton bought will can be processed to spin Yarn of desired specifications.

c) To check the quality of sample cotton with quality of delivered cotton.

d) To decide about correct machine settings and speeds for processing the cotton

e) To estimate profitability of purchase decisions.

Knowing the cotton properties is only half the battle for profits. It needs expertise to know how to get best of its value.

Currently popular instrument called HVI gives ready information on various parameters to make correct purchase decisions.

If may not be possible to get all the desired qualities in one variety or one lot of Cotton. In such case, an intelligent decision to select best combination of different varieties or lots to get desired Yarn quality is necessary to get optimum yarn quality at optimum cost.

If correct evaluation is made, profits are large. Hence, evaluation of quality is essential for optimum profit making and also make the customers happy with supply of correct quality of Yarn.

Expert classers can manage to achieve reasonable level of correct evaluation. Now, with availability of better instruments, it is better to check qualities to make sure that desired quality of cotton is procured. These details should give cotton buyer reasonable guidance to make correct evaluation of cotton quality and ensure its suitability for producing required quality of yarn.

QUALITY EVALUATION	CHARACTERISTICS CO-RELATION TO YARN
1. Staple Length	Spinning Potential
2. Fiber Strength	Yarn strength, less Breakages
3. Fineness	Finer Spinning Potential
4. Maturity	Yarn Strength and even ness, better dyeing
5. Non-Lint.content (Trash)	Reduced Waste
6. Uniformity Ratio	Better productivity and Evenness
7. Elongation	Less end Breakages
8. Friction	Cohesiveness
9. Class	Yarn Appearance
10. Stickiness	Spinning problem by lapping & Dyeing quality
11. Grey Value	Yarn lustre
12. Yellowness	Yarn Appearance
13. Neppiness	Yarn neppiness
14. Moisture Content	8.5% moisture content optimum for spinning at 65%

QUALITY TESTING INSTRUMENTS:

Instrument	Measurements
Fibrogaph	Length
Pressley Apparates	Fiber Bundle Strength
HV I Instrument	Length, Strength, Uniformity, Elongation, Micronaire, Color and Trash
Stelometer Instrument	Strength, Elongation
Micronaire	Combined test of fineness & maturity
Shirley Trash Analyser	Trash Content
Manual Test	Class & staple length
Moisture Meter	Moisture
Colorimeter	Grey value & yellow ness. Brightness
Polarised light Microscope or Casricaire test	Maturity
Photographic film	Neppiness