



BAJAJ STEEL INDUSTRIES LIMITED

IMAMBADA ROAD, NAGPUR- 440 018. INDIA

Tel: +91-712-272 0071 ~ 80 Fax: +91-712-272 8050 / 272 3068

email : bsi@bajajngp.com website : www.bajajngp.com

Content Sr. No. (17) Seventeenth – Page No.161-168)

*Rohit Bajaj & M.K. Sharma – Current scenario of Cotton Ginning Industry – Book of Papers,
21st International Seminar on Cotton & its Utilization in the 21st Century (Dec.1999) CIRCOT.*





BAJAJ STEEL INDUSTRIES LIMITED

IMAMBADA ROAD, NAGPUR- 440 018. INDIA

Tel: +91-712-272 0071 ~ 80 Fax: +91-712-272 8050 / 272 3068

email : bsi@bajajngp.com website : www.bajajngp.com

CURRENT SCENARIO OF COTTON GINNING INDUSTRY

Rohit Bajaj* / M.K. Sharma+

Introduction

Cotton is the world's most important textile fibre, forming almost half of all textile fibres used and it is one of the world's most important agriculturally produced raw materials. Throughout the world, about 1.1 billion bales (480 LB/Bale) are produced annually. Over 250 million people world-wide derive, some or all of their cash income from it. Everyone knows that cotton is used to make variety of clothes, domestic uses and medical uses. In India, cotton occupies eminent place among cash crops. India has made rapid strides in the production of cotton from 2.79 million bales of 170 Kgs. each in 1947-48 to 17 million bales in 1998-99. At present, India is not only self sufficient in its total requirement of different quality cotton for its flourishing textile industry but also have some exportable surplus of cotton.

The quality of cotton fibres is dependant on genetic position, conditions under which the plant is grown, picking practices, storage practices, transportation practices, pre-cleaning and moisture control, type and conditions of gins, setting / adjustment on gins, lint cleaning and handling of lint from the gin stand to the press and baling practices. Out of all these, the ginning plays a very important role in the preservation of cotton quality.

*Rohit Bajaj, Managing Director, Bajaj Steel Industries Ltd., Nagpur - 440 018

+M.K. Sharma, General Manager, Bajaj Steel Industries Ltd., Nagpur - 440 018.

(Manufacturers of Double Roller Gins and allied equipments for Modern Ginning Plants in Technical Collaboration with Central Institute for Research on Cotton Technoloty (CIRCOT) Mumbai, India)

bajaj



2

In the countries where the cotton is hand picked, ginning is the first important mechanical processing that cotton undergoes from the cotton field to the textile mills or other uses and in the countries where the mechanical harvesting of cotton is done the ginning is also first mechanical process which separates cotton seeds from fibre by which cotton is made useable for textile mills and other uses. Although the ginning is most important mechanical treatment to maintain the quality of cotton, the history of ginning in India, reveals that it is probably considered as one of the least important and neglected aspect.

By the time, the cotton enters the gin its quality in terms of fibre properties such as length, strength, maturity and fineness has already been decided. It is only the ginning practices and conditions at ginning factory which can maintain the quality of the cotton and the cotton seed with a very little scope for betterment of lint quality by lint cleaning process and baling parameters.

1PRESENT STATUS OF GINNING IN INDIA

The ideal Ginning Factory mainly should consist of following :

1. Proper Weighing facilities on arrival of cotton and on removal of ginned cotton / bales.
2. Proper Raw Cotton storage arrangements for moisture controlled contamination free storage and neat & clean surroundings.
3. Properly set Ginning Machines & well maintained conveying systems at all stages to get best out-turn & contamination free cotton.
4. Proper handling arrangements for raw cotton from storage to gin machine and for lint from gin machine to lint storage places and baling to avoid contamination / deterioration of cotton.
5. Properly maintained Baling Press & desired Packing Materials for cotton bale making for contamination free suitable bale.
6. Proper testing equipments and moisture control arrangements as required during ginning and baling.

Apart from the machinery and baling arrangements it is of vital importance that the people working in the ginning factory are serious about control of contamination in the cotton and maintaining the quality of cotton. Their continuous efforts can help a lot in this direction.

bajaj

3



The settings of the gin machine and overall maintenance of all the equipments is also of vital importance.

However, in India and other countries many of above requirements are not being met, resulting in the lowering / deteriorating the cotton quality. At present, in India there are about 4000 Cotton Ginning Factories mainly situated in rural and semi urban areas out of which majority are running on double roller cotton ginning machines while the northern states i.e. Punjab, Haryana and Rajasthan are having saw gins at some of ginning factories.

The various studies conducted in India show that the most of the Indian Cotton varieties can more suitably ginned on Roller Gins. Double Roller Gins are preferable over Single Roller Gins. The Saw Gins is used only for some cotton varieties grown in the Northern States.

Though the Double Roller Ginning Machines used in India are having advantages of higher out turn without any damage to cotton fibre, and can produce excellent results if pre-cleaning, post-cleaning and contamination free Conveying Systems are used, the present status of the Cotton Ginning Factories does not meet the requirements for producing quality cotton. The majority of Ginning Factories in India are having only one building housing Ginning Machines and entire storage is in the open area. Further, no pre-cleaning or post-cleaning equipments are used. The handling of the cotton is totally manual and no automatic systems of cotton conveying are used. Very few Cotton Ginning Factories in the state of Gujarat and some other states have started using some pre-cleaning & post-cleaning and Pneumatic Conveying Systems. These Ginning Factories can be termed as Semi-Automatic Ginning Factories and the lint quality obtained in these Ginning Factories is better than conventional ginning factories. However, much is still needed to be done in respect of these ginning factories also to bring them up to the desired level. To be more specific, the various aspects affecting the ginning quality in Indian cotton ginning factories are detailed herein below :



1. PICKING

Though no other method of harvesting can produce seed cotton of higher grade than good hand picking but in case of India seed cotton coming to the market contains considerable amount of trash which can be attributed to defective collection practices, bad storage and open transportation. Most of the trash like leaves, plant parts, immature bolls, small stones, dust, sand etc. get collected with seed cotton. The pickings are done at periodical intervals and picked cotton are heaped on the ground without adequate protection from the various type of trash including sand. The deterioration also occurs due to exposure to sun, wind, dew and rain. Weight being the main criterion for paying labour as also in selling of seed cotton, care is not generally taken to remove insect attacked, immature and otherwise defective bolls & impurities.

The picking practices should be improved in a way that temptation of increasing the weight by impurities is removed and the cleaned cotton picking is rewarded.

2. TRANSPORTATION

Most of the Indian farmers have the small holdings and generally yield is quite low, they can not afford to use modern methods to transport raw cotton from the farm to the nearest market. Transport systems is quite primitive and the raw cotton is subject to vagaries of poor handling and bad storage practices by the farmers. After transporting to the market yards Seed Cotton is often unloaded on the ground in the market yards where the flooring and surroundings are not maintained clean. In the absence of covered sheds and cemented clean flooring seed cotton meant for auction get contaminated / deteriorated. The transportation from market yards to ginning factories is also done in open vehicles affecting its quality.

The collection of the cotton in fully covered cloth bags for reducing the contamination and safe transportation be encouraged to avoid addition of any contaminant / deterioration during transportation.



3. INITIAL QUALITY INSPECTION AND WEIGHMENT

The raw cotton is purchased / received at Ginning Factories on weight basis without giving proper weightage to percentage of contamination and moisture. Due to this the farmers are tempted to increase the weight by addition of water and contaminants. If the strict norms in this respect are enforced, these practices may be controlled.

4. STORAGE

In most of the cotton Ginning Factories in India, the cotton is stored in open area with surroundings full of dust and other contaminants such as dry leaf bits, plastic materials and other materials thrown up by human beings or blown by winds.

The storage should be done in fully covered concrete godowns having neat and clean surroundings. The some of the Ginning Factories have since realised the need for making covered paved warehouses which will save cotton from contaminations rains and dew etc.

5. HANDLING OF COTTON WITHIN GINNING FACTORY

At present majority of the cotton Ginning Factories are handling raw cotton as well as lint cotton and cotton seeds manually. The hygienic conditions in the Ginning Factories have much to be desired, the cleaning of gin house is not done properly, dirty cotton lint, oil and grease stains, nut bolts, metal pieces, broken wooden pieces, broom pieces, wire, raw cotton and seed entangled in gin or other places etc. find its way to lint. The majority of the Ginning Factories are not having efficient / adequate supervision which leads to negligence or carelessness on the part of the labourers working in Ginning & Pressing Factories and consequential increase in the presence of foreign materials such as human hair, coir pieces, cloth pieces, jute threads, wood pieces, pieces of cigarettes, bidis, tobacco pouches, dusts and stone etc.



Since, the gins and presses are situated at considerable distances and since there is a belief that the storing of lint increases the staple length the lint is first accumulated before each gin stand and rolled on to the next stand in the row and likewise it is rolled from one stand to other for number of times before being filled in bags. The repeated rolling of lint reduces the grade and the lint gets contaminated with trash and stains (oil etc.) from the floor. The bags used are made of jute which also causes contamination.

Some of the ginning factories have now started use of pneumatic conveying / mechanical conveying of raw cotton as well as lint cotton and composite ginning and pressing plants are being preferred over Conventional Ginning Factories. This needs to be further encouraged to improve the quality of cotton. The Pneumatic / Mechanical Conveying and maintaining of cleanliness can only reduce contamination in cotton. The Cotton Ginning Factories should install necessary equipments for Pneumatic / Mechanical handling of cotton within Ginning Factories and the floor and surroundings should be kept clean.

6. CLEANING

The Indian Lint is notorious for the high trash contents ranging from 4% to 10% as against 3% to 4% found in America and Egyptian Cotton. The International Textile Manufacturers Federation, Zurich has listed India as having most contaminated cotton in the world. It is important to note that trash removal is relatively an easy job if attempted before ginning. Once the cotton is ginned and pressed, the adherence of impurities to the fibre becomes stronger. Moreover, certain classes of trash like leaf bits and motes get further fragmented during Ginning and Baling process. Thereby rendering subsequent cleaning at spinning mills more difficult. The Indian Cotton reaches Ginning Factories in highly contaminated condition and it is more difficult to have the controls at the pre-ginning aspects of harvesting and transportation to reduce contamination as the spread is quite wide, hence it would be best to reduce the contamination by pre-cleaning at Ginning Factories. However, the most significant aspect of ginning in India is that cleaning of Seed Cotton is rarely done by the Ginning Factories as they do not have mechanical pre-cleaning machinery.



It is therefore essential that all Seed Cotton in the Ginning Factory should under go some mechanical pre-cleaning apart from manual removal immature insect attacked and damaged bolls. Pre-cleaning not only helps in getting clean cotton but also improves gin productivity and reduces power consumption at the gin. The Central Institute for Research on Cotton Technology has designed a Pre-cleaner called CIRCOT Raw Cotton Pre-cleaner which is being manufactured by M/s.Bajaj Steel Industries Limited, Nagpur under technical collaboration agreement.

7. GINNING MACHINES

Because of the major contribution of ginning to lint quality one should be extremely careful in the selection of Ginning Machinery. The details about the lint quality obtained on the ginning machine is of prime importance apart from the productivity. The advantages and disadvantages of low production ginning machine as well as high production ginning machine should be carefully compared.

As far as the Indian Cotton varieties are concerned the test result have shown that the Double Roller Gins are most suitable hence almost all the ginning factories in India use double roller gins except few Cotton Ginning Factories in the states of Punjab & Haryana where Saw Gins are used for short staple cotton. Roller Gins are manufactured in India and the cost is very low as compared to that of Saw Gins. Their mechanism being easy, they have less number of moving parts and the machines can be adjusted and successfully work by less experience fitters. Test results shows that Roller Gins give about 1% higher lint percentage and the lint produced is less neppy and has very little fibre damage. Though some old model Single Roller Ginning Machines are being used by various Indian Ginning Factories but due to their being un-economical as compared to double roller these single roller gins are being replaced by Double Roller Ginning Machines.

In India, at present almost 75% of raw cotton is being ginned on double roller cotton gins. The ginning out turn and average 2.5 % staple length obtained on these roller ginning machines are on higher side as compared to saw gins. However, the other requirements of ginning factories, such as pre-cleaning and post-cleaning, proper storage, moisture control are not being met by Indian Ginning Factories which is affecting out turn as well as cotton quality.



Further, the owners of cotton ginning factories in India, do not give due consideration to use good quality ginning machines with desired literature and quality parts from suppliers of proven track record. Also old and out dated machineries with worn out parts are being used. The bad quality machines results in deterioration of fibre quality. The efforts are being made by Central Institute for Research on Cotton Technology (CIRCOT), Mumbai, to improve quality of double roller ginning machines and improved Double Roller Ginning Machines are being made under their technical collaboration agreement at Bajaj Steel Industries Ltd., Nagpur. The population of Bajaj Double Roller Cotton Ginning Machines have grown to over 25,000 covering about 75% of the total ginning capacity requirement in India. The other Ginning Factories which are having Single Roller Ginning Machines as present are fast replacing them with Double Roller Ginning Machines and all new Ginning Factories are being established with Double Roller Ginning Machines only. If these Ginning Factories, gin cotton in contamination free conditions on Double Roller Ginning Machines the quality of cotton can be one of the best in world.

The Composite Ginning and Pressing Factories having Double Roller Ginning Machines with Cleaning and Automatic Conveying Systems can only give best out turn and fibre quality, hence Ginning Factories should be established on these lines.

8. CONDITION AND SETTING OF GINNING MACHINES

The condition of the ginning machine is also an important factor affecting the lint quality. The various Ginning Factories in India used old and out- moded machinery with worn out parts results in bad ginning. In case of Roller Gins the worn out parts should be replaced periodically, the knives should be sharpened at regular intervals, the rollers should be grooved every day and the proper attention should be paid to the settings of knives for better performance. Proper overlap adjustment, Grids selection, Roller and Beater speed, Feeding rate of raw cotton are important aspects of machine adjustment. The services of trained and experienced gin fitters are required. The ginning being a seasonal work most of the factories do not employ qualified fitters for the whole year and no attention is paid to the machines



during off season. The untrained fitter casually employed during the season often do not set the gins properly. The defective settings results in poor quality ginning with cut and whole seeds and lower fibre length etc.

The better maintenance of the machines with proper adjustments will give better performance.

9. MOISTURE

The suggested range of the moisture contents is 6.75-8.25% during the ginning, however, for increasing the weight some time farmers add water to raw cotton. Improper storage / rain and the atmospheric conditions affect the moisture contents. In India. No testing of fibre quality is normally done at Ginning Factory level. Further, moisture control equipments are also not used. The excess moisture as well as lower moisture affects the fibre quality. The need to install moisture control equipments is being realised by ginning factories now and some Ginning Factories have already started using moisture control equipments, this needs to be encouraged.

10. BALING

In India, very few factories are Composite Ginning & Pressing Factories. The Ginning Factories which do not have baling presses fill the lint in jute bags (Bondri) to transport the same to the baling units, further, the Ginning and Pressing Factories which have the baling presses also fill the lint in jute bags for shifting and weighing purposes. These jute bags are tied by a jute thread. The surroundings of the baling press is full of spillage of oil etc. These practices add contamination. During last 2-3 years few Ginning Factories have started using pneumatic / mechanical conveying systems for lint from gin house to baling press. This has given improved lint quality. However, a lot needs to be done in this regard by a large number of cotton ginning factories. The composite Ginning and Pressing factories with fully automatic cotton handling systems needs to be encouraged.



The packing material used for baling of cotton is very often short to cover the bale fully and is made of jute. This needs to be changed by a full cover of good quality cotton cloth.

The bales in India are made at a very high pressure to make them smaller in size to reduce transportation space requirement. This creates problems at the time of opening of bales at textile mill level and also affects the fibre quality. The baling should be with universal pressure for which proper Baling Presses needs to be used. Further, the weight of the bales is found to be different in various Pressing Factories i.e. either 170 Kgs. bale or 220 Kgs. bale etc.

The different weight and sizes of bale create lot of problem in the marketing, handling, blow room machinery designing and International Trading of Cotton. Therefore, the weight and sizes of Cotton Bales should be standardised Internationally.

11. TRAINING OF GINNING FITTERS

Gin Setting & Gin Maintenance are critical operations. The ginning operation by a skilled fitters are necessary for production of quality lint even if machines are new and modern. The proper operation of gins with proper settings and adjustments of various parts such as fixed knife, moving knife, overlap, grid, rate of feeding, running speed of roller and beater, timely lubrication and replacement of worn out parts have to be attended to depending upon the quantity and variety of cotton to be ginned. The need for trained fitters is much felt by the Ginning Factories in India. The Central Institute for Research on Cotton Technology (CIRCOT) has set up a ginning training centre at Nagpur to help the availability of trained ginning fitters for Ginning Factories. The centre has all the infra-structural facilities necessary for ginning fitter / grader / factory owner training including all type of ginning machines, cleaning equipments, fibre testing equipments, micro spinning units, HVI Testing Equipments and Trained staff. The centre is conducting regular training programs for the benefit of ginning units in private and public sector. Special Courses are conducted for up-gradation of knowledge of senior staff of marketing organisation also.

Bajaj



BAJAJ STEEL INDUSTRIES LIMITED

IMAMBADA ROAD, NAGPUR- 440 018. INDIA

Tel: +91-712-272 0071 ~ 80 Fax: +91-712-272 8050 / 272 3068

email : bsi@bajajngp.com website : www.bajajngp.com

1 CHANGING SCENARIO OF GINNING IN INDIA

Now the Ginning Industry has realised that the Composite Cotton Ginning & Pressing Factories based on Double Roller Ginning Machines with Modern Cleaning and Conveying Equipments can only give best ginning results and all the efforts are being made to up-grade the existing Ginning Factories to meet the requirement.

The Government of India has realised that it is essential to give some incentive to modernise the cotton Ginning Factories in India and promote only composite cotton Ginning and Pressing Factories with modern mechanical / pneumatic cotton handling systems having proper storage arrangements. For the purpose Government has announced the scheme called, “Technology Up-gradation Fund” where the 5% interest burden for the loans taken by Cotton Ginning Factories is born by Central Government. This scheme has been made applicable w.e.f. 01.04.1999.

The Government of India is also considering a separate fund for “Technology Mission on Cotton” where 25 % cash subsidy is proposed for acquiring modern ginning equipments used for reduction of contamination in cotton by Ginning Factories. The Ginning Factories have started up-gradation of their facilities which is the need of the hour and the schemes announced by Government of India are encouraging more and more Ginning Factories to take up modernisation. Some of the new ginning factories have already installed Fully Automatic Cotton Ginning Factories having 24 or more Double Roller Cotton Ginning Machines, Automatic Cotton handling systems, and automatic baling presses. These Cotton Ginning Factories have also constructed cemented platforms with covered sheds for Raw Cotton Storage and many more Cotton Ginning Factories are pursuing the path. The days are not far away when most of the Indian Cotton Ginning Factories will have all the necessary infrastructure i.e. 24 or more Double Roller Ginning Machines, Proper cemented and covered Raw Cotton Storage Godowns, Pre & Post-cleaning Machinery and Automatic Conveying Systems at all necessary stages. Such Ginning & Pressing Factories will produce contamination free better quality lint and the Indian cotton would get its due place in International Quality Cottons. The bales produced in Indian Ginning & Pressing Factories will have lowest contamination and better fibre quality.

bajaj