CIRCOT ginning bulletin

Volume 10 October 2009 to March 2010 Issue 2

EDITORIAL

The Technology Mission On Cotton-the mini mission iv entrusted with the job of upgradation and modernisation of ginning and pressing units in the country is almost on its last lap. This Government of India programme is very close to reaching its target of modernising/ upgrading 1000 G&P factories with modern infrastructure that is capable of turning out contaminant-free, least trashy, quality bales for use not only by the domestic spinning sector but also by the global spinning industry.

A close look at what has been achieved so far clearly brings out the fact that the scheme could be of benefit to the west zone in the country and to a very little extent only the other regions could take the benefit. Be it the smaller size of the crop, the ginning capacity or lack of foresight among ginners or for whatever reasons best known only to the ginners in that region, the southern ginning industry barring a few from Andhra Pradesh, and more specifically in Karnataka and Tamil Nadu did not avail of the golden opportunity offered by the government. Now the bus has been totally missed.

Not withstanding the fact that the so called "modernisation of old ginneries" could be at best described as "partial" and "incomplete"; the modernised ginning units have improved the ginning operation and are turning out cleaner bales. An introspection into the components of modernisation in ginneries brings out the fact that the "bale press" section did not essentially change in many of the so called "TMC-modernised ginneries". The old highly energy inefficient, largely human-operated bale presses continue to do the job. The moistourisation of lint during precleaning, ginning, after ginning but before baling, and during baling is an important parameter contributing significantly to the quality of precleaning, ginning and also that of bales and their storage. This aspect also did not receive the kind of

Highlights

attention and impetus that it ought to have. Also the concept that a ginner is not a "job-worker" but is an all important link in the value chain who is a "provider" of quality bales to the spinning industry could not get the desired attention in in ginning circles. The component of "HVI Testing" that was offered in the modernisation package, albeit in an optional mode, was essentially to drive home this point to the ginner that he should equip himself to characterise the quality of bales that he produces, if need be, segregate them quality-wise say in terms of micronaire grades , and offer suitable quality bales to spinning unit as per demand and reap "commensurate benefit" for that extra effort he puts in.

It is a sad story that many of the ginneries who went for modernisation did not opt for HVI units. A few of them who went ahead and installed the HVI machines seem to be not utilising them properly."Quality of tagged bales" if offered by the ginner to a spinner as per his demand, should fetch the ginner "better price" as the arduous task of bale separation and management being performed by the spinner today is totally avoided and he is spared of this additional effort. But to do this job efficiently and effectively, the ginner should be able to thoroughly understand the concept of quality, operation of HVI ,interpretation of results of HVI measurements and above all possess a trained technician to manage the setup .Here comes the need and significance of training.

As is well known and often indicated in this news letter, CIRCOT offers a comprehensive training programme at its Ginning Training Centre at Nagpur, on ginning, maintenance and fibre quality for the benefit of the operators and managerial staff of ginneries. At its headquarters at Mumbai, the Institute offers a training module on fibre quality assessment that encompasses measurement of fibre parameters, cotton grading and other related aspects. CIRCOT also conducts special package courses for HVI training wherein highly individual- oriented training on operation of the machine, data-processing and analysis, and interpretation of results including statistical significance is provided.

A discerning ginner, particularly those from the younger generation with business management background, having modernised infrastructure should attend all these three training programmes and also get his staff including the shop-floor personnel trained at GTC , Nagpur for ginning and fibre quality assessment. This would, I am sure, empower him not only to manage and maintain his factory but more importantly enable him to change the attitude of the ginners about themselves as well as how the spinning industry thinks about them. The day has come to realize that the ginner is no more a "job worker" but is one who could help the spinning industry to source quality bales and provide the same with appropriate incentives.

S. Sreenivasan
Director

R & D GLEANINGS

On Optimal Moisture Content for Seed Cotton during Pre-processing and Ginning

Storage:

Adequate storage facilities for seed cotton on the farm or at the gin are essential so that the cotton may be harvested quickly before weathering reduces its quality. Seed cotton may be stored in piles on the ground, sheds, storage houses, trailers or modules as long as it is protected from damage due to weather and excessive ground moisture. When seed cotton is consolidated for storage, it should be in a covered area preferably with a high-quality tarpaulin. Moisture content, length of storage, duration of high moisture during storage, initial temperature of seed cotton during storage, weather factors (temperature, relative humidity, rainfall) and protection of cotton from rain and wet ground are parameters that affect seed and fibre quality during seed cotton storage. The seed cotton is compacted to a density of about 100-120 kg/m^3 in heaps.

Some colour degradation occurs (spotting) in seed cotton stored at a moisture level of about 11%. At high moisture levels, bacterial action causes temperature increase within 48 hours that results in discolouration. High moisture content causes yellowness to increase sharply at levels above 13-14%, especially when the storage period exceeds 45 days. For long storage periods, moisture should be maintained below 12%.

Yellowing is accelerated at high temperature. The rate of lint yellowing increases sharply at moisture contents at and above 13% and can increase even after the temperature of the heap drops. Temperature rise is related to the heat generated by bacterial activity. Both temperature rise and maximum temperature are important parameters in seed cotton storage. Temperature rise of 8°C or more or temperature above 49°C indicates the need for immediate ginning to minimize quality degradation.

Pre-cleaning:

Cleaning machinery removes foreign matter from the cotton. Unfortunately, these machines also remove small quantities of good quality cotton in the process of removing foreign matter and as a result, the quantity of marketable cotton is reduced during cleaning. Cleaning cotton is therefore a compromise between foreign matter level and fibre loss and damage. The trash removal efficiency and fibre damage are inversely proportional to the fibre moisture. Pre-cleaning efficiency is high when cotton is dry. Cleaners remove more trash below 6-7% moisture but not without more fibre damage. Cotton at 5% moisture results in better cleaning and has a smoother appearance, which is preferred by many classing and marketing systems. Fibres with low moisture content become brittle and will be damaged by the mechanical process required for cleaning. Appropriate drying systems can dry cotton to the desired moisture level. Drying systems are not prevalent in Indian ginneries. Sun drying is practiced in India to dry the high moisture cotton. Generally 6% moisture is better for precleaning.

Ginning:

For ginning the ideal moisture in seed cotton is 7-8% i.e. higher than at cleaners. Higher moisture levels at ginning stage will be beneficial because the fibres will be stronger and hence

breakage will be reduced. Also static electricity formation and consequent sticking of fibres on the machine parts could be averted. The breakage rate of fibre during ginning is inversely proportional to fibre moisture. It must be remembered that moisture standards for pre-cleaning and ginning are different. Dryness promotes efficient cleaning while causing fibre breakage during ginning. Ginning below 5% moisture is highly undesirable. For every 1% reduction is moisture content below 5%, fibre length may fall by 1 mm. Increasing moisture in seed cotton at the ginning stage is therefore necessary for increasing ginning efficiency and preservation of fibre quality.

Methods of Moisture Restoration in Cotton:

The most commonly used systems for moisture restoration are described below :

1. Benson fan
2. Humidifiers
3. Nozzle spray system
4. On line humidification with steam or water

Benson Fan

The most commonly used method of water application in cotton gins is by the use of Benson fans. In this, water is pumped and dropped in front of the blades of the fan, which are rotating at higher speeds. The small droplets of water are formed and thrown on the cotton mass with great velocity. In this method of water application, there is chance of water dripping from the fan as tiny droplets and hence uniform. application of water is not achieved.

Humidifiers

In this system water is passed at higher pressure generated with the aid of a compressor. Depending on the design of nozzle. It is possible to generate a fog of fine droplets of 10 microns diameter or less. In factories where a central/ side platform exists, this system of water application is quite useful.

Nozzle spray system for moisture restoration

In nozzle spray system, water is atomized and directly sprayed on the cotton. The water is atomized into superfine droplets that would settle down on the fibre. Sometimes a wetting agent is added to the moisture to hasten its distribution through the cotton. Moisturizing at pala house should preferly be done through nozzle spray system. At the pressing stage, atomized water is administered at the lint slide or at the condenser. It must be ensured that wet spots are not created in the base due to failure of atomization of water at the nozzles.

On line humidification with stem or water

For on line humidification, either steam or humid air is used to moisten the cotton. The air is heated to carry sufficient moisture to the cotton fibre. The vapour pressure of the humid air must be higher than that of the fibre, and this requires higher air temperature to make the vapour flow to the fibre. Humid air is introduced at various locations with the pneumatic suction lines. Sometimes steam is injected in the conveying line to moisturize the cotton. Addition of an appropriate quantity of wetting agent is necessary to ensure quick absorption of water by the fibres. This system of water application is quite expensive and so far not indigenized.

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RESEARCH ABSTRACTS

I. Influence of grid bar shape on field cleaner performance

Previous research has shown that the performance of sling-off type cleaning machines designed to remove foreign matter from harvested seed cotton is influenced by design factors such as grid bar to saw cylinder clearance, grid bar spacing, saw cylinder speeds, and saw cylinder arrangement. However, very little research has been done to address the influence of grid bar cross sectional geometry on machine performance. The objective of this research is to quantify the influence of grid bar cross sectional geometry on foreign matter removal, seed cotton loss, and fibre quality preservation. Screening tests were conducted on a John Deere field cleaner at the USDA-ARS Cotton Production and Processing Research Unit in Lubbock, TX. Twenty-eight grid bar treatments were evaluated in the study under a completely randomized design with three replications per treatment. Seed cotton samples were collected before and after the cleaner for fractionation analysis. Samples of the material removed from the seed cotton by the cleaner were also taken for fractionation analysis. The cleaned seed cotton was ginned and lint samples were sent for HVI and AFIS analysis at Cotton Incorporated. The results of these analysis will be used to select two grid bar treatments to evaluate against the control treatment in a multi-variety field scale test during the 2008 harvest season.

Wanjura, John, Hold, Gregory, Carroll, Jeffery (Abstract of the National Cotton Council Beltwide Cotton Conference. January 8, 2009)

II. Picker Versus Stripper Harvesters on the High Plains of Texas

A break even analysis based on Net Present Value (NPV) was conducted to compare picker-based and stripper-based harvest systems with and without field cleaners. Under no conditions analysed was the NPV of a stripper system without a field cleaner greater than a stripper system with a field cleaner. Break even curves relating yield to harvested-area-per-machine were developed to compare picker-based systems with both stripper-based systems. The break even yield decreases as the area harvested per machine increases. Furthermore, the yields required for picking to be more profitable than stripping are achievable on the High Plains if a producer has sufficient area to harvest per machine. The results of a sensitivity analysis of the NPV model demonstrate that the model is most sensitive to changes in the difference between picked and stripped lint, which is most influenced by growing conditions rather than harvest method. The model is relatively insensitive to level changes in the price of lint. The model is relatively sensitive to changes in seed turnout and machinery purchase price. It is expected that the break even yield for a given harvested area will decrease with more adverse growing conditions (leading to less mature fibers) and increase with more ideal growing conditions (leading to more mature fibers).

Faulkner, W.B., Wanjura J.D., Shaw, B.W. (Proceedings of the National Cotton Council Beltwide Cotton Conference. January 5-8, 2009, San Antonio, TX, p.291-298, 2009)

III. Effect of Harvesting Method on the Fibre and Yarn Quality from Irrigated Cotton on the High Plains

In recent years, Texas cotton production has represented almost half of all the US cotton production, with most of that production coming from the High Plains. Due to the harsh weather conditions, cotton on the High Plains is of more storm-proof varieties that are harvested using

stripper harvesters. Unlike picker harvesters which use spindles to remove seed cotton from the boll of the plant, stripper harvesters use brushes and bats that indiscriminately remove seed cotton, bolls, leaves, and branches from the plant. As a result, stripper harvested cotton contains more foreign matter than picked cotton and generally contains more immature fibres that are left on the plant by spindle harvesters. Stripper harvesters have several advantages with regard to maintenance requirements, and greater efficiency in low yielding cotton. Picker harvesters, however, pick cleaner cotton, are perceived to maintain fibre quality better than strippers, and are able to harvest at higher speeds in high yielding stands. Foreign textile mills continue to raise their standards for fibre quality as cotton spinners are forced to compete with synthetic fibres. Increased yields in the region and higher quality demands have the potential to make harvesting High Plains cotton with pickers an attractive option. The objective of this research is to compare fibre and yarn quality from four varieties of cotton harvested on the High Plains using modern picker and stripper harvesters.

Faulkner, W.B., Wanjura J.D., Shaw, B.W., Hequet, E.F. (Proceedings of the Beltwide Cotton Conference. January 5-8, 2009, San Antonio, TX, p.449-461, 2009)

IV. Optimal Substitution of Cotton Burr and Linters in Thermoplastic Composites

A study was conducted to evaluate various substitutions of cotton burr and linter fractions of cotton gin waste (CGW) as a natural fibre source in ligno-cellulosic polymer composites (LCPC). Samples were fabricated with approximately 50% natural fibre, 40% of high-density polyethylene (HDPE) powder, 4% mineral filler and 6% of lubricant, by weight. The composition of the fibre filler was varied from 0, 25, 50, 75 and 100% by weight of either cotton burr (CB), or cotton burr with 2% of second cut linters (CBL), with the remaining fraction as wood flour. Samples were extruded into cotton rectangular profiles with a 31.7 x 6.3 mm die, and tested for physical properties such as specific gravity, water absorption and thickness swelling, and mechanical properties such as flexural strength, flexural modulus, hardness, screw withdrawal strength, and coefficients of linear thermal expansion (CLTE). Both CB and CBL improved the surface hardness of the LCPC, but deteriorated water absorption as well as strength properties such as modulus of elasticity (MOE), modulus of rupture (MOR) and compressive strength. A favourable property of CBL was its effectiveness in decreasing CLTE of LCPC.

Bajwa, S., Bajwa, D., Holt G.A., (Forest Products Journal, 59(10); 40-46, 2009).

V. Development of a High-capacity Extractor Cleaner for Cotton Stripper Harvesters - Machine Design and optimization

Cotton strippers have used extractor type cleaners for many years to remove large foreign material from harvested seed cotton. These machines are commonly referred to as "field cleaners" and are similar in design and operation to stick machines used in gins. The field cleaners used on modern cotton strippers are capable of processing burr cotton at the harvesting rate of four row strippers but are overloaded when used on strippers with six and eight row wide headers. The objective of this work is to report on the design and optimization of a new field cleaner with improved cleaning performance and processing capacity. A 0.305 m (1 ft) wide prototype machine was constructed and used in a response surface experiment to optimize cleaning performance and lint loss. Predictive equations were developed using five configuration factors; loading rate per unit width, primary saw cylinder speed, reclaiming saw

cylinder speed, primary saw grid spacing, and reclaiming saw grid spacing. As observed in previous work, the results indicate that a balance must be reached in the trade-off between maximizing cleaning performance and minimizing lint loss. The results also indicate that the experimental machine is capable of reaching 60% cleaning efficiency but that additional design modifications and testing are necessary for the machine to reach the lint loss design goal of less than or equal to 1%.

Wanjura, J.D., Holt, G.A., Byler, R.K., Brashears, A.D., Baker Jr., R.V. (Transactions of the ASABE. 52(6): 1821-1829, 2009)

VI. Cotton Fibre Moisture Measurement - From the Bale to the Laboratory

Moisture is an important attribute for processing and marketing of cotton fibre. The accurate and precise measurement of fibre moisture continues to be an issue of importance in the global market place. There are several commercially available moisture measurement instruments for fibre moisture measurements in the laboratory, at line, and in the bale (at-line and on-line). These moisture units typically use the ASTM oven method (thermal gravimetric) as the reference method for moisture. Several at-line and bale (at-line and on-line) moisture measurement systems are reviewed, and their technical capabilities discussed. Most often, it is desired for these at-line and on-line systems to agree closely with laboratory fibre moisture measurements. There are several forms and types of laboratory fibre moisture measurements and measurement systems, each with their own advantages and disadvantages. Moisture measurements and systems can generally be divided into thermal, chemical, spectroscopy and "electric" categories. Several of the more common fibre moisture measurement systems were compared on a set of domestic and international cottons, using the oven method as the reference method. Most of the fibre moisture measurements and systems yielded acceptable/good agreement to the oven method (within + 0.5% moisture with the oven method for greater than 90% of the samples analysed.) However, few of these systems agreed to the much tighter" and desired" method agreement of within + 0.3% moisture for greater than 80% of the samples analysed. A comprehensive Comparison Matrix was developed that combines both non-technical and technical attributes so as to assist the potential purchaser in selecting the best overall moisture measurement system for his/her needs. The commercial moisture units typically use the ASTM oven method (thermal gravimetric) as the reference method for moisture. New research is focusing on a chemical method as the reference method for fibre moisture, and the status of this research is reviewed. In general, the chemical method yields lower moisture compared to the oven method.

Radogers III. J.E., Delhom, C.D., Montalvo Jr., J.G., Thibodeaux, D.P., Cui, X, (Proceedings of 30th International Cotton Conference. Bremen, 190-198, 2010)

VII. White Speck, a Dye Defect in Mechanically and Hand Picked Cottons

The textile industry is often caught off guard by white specks showing up in dyed fabrics. The current grading system does not always pick up the level of maturity that causes white specks. Research using International cottons is aimed at finding high-speed measurement systems that can be used to predict the white speck potential of bale cotton. Cottons were gathered from the following countries: Australia, Brazil, China, Pakistan, Turkey, Uganda, the United States, Uzbekistan and Zimbabwe. Ultimately a White Speck Potential (WSP)

measurement could be included in the HVI data that the mills currently use to buy cottons. By knowing the WSP, mills could eliminate white speck dye problems and still use those cottons for their other fibre properties and produce whites or pastels where the dyeability of the cotton is not a problem. The cottons with a high WSP can also be combed or rotor spun to minimize white specks. This will also be a useful tool for breeders so that they can eliminate new varieties that are prone to high WSP early on in the breeding process.

Bel, P., Xu, B. (Proceedings of the National Cotton Council Beltwide Cotton Conference. February 8, 2010)

VIII. Seed-Coat Fragment in Fibre and Fabric Quality in World Cottons

Seed Coat Fragments (SCF) can be neps that can cause spinning problems and fabric defects, which ultimately cause losses to the cotton industry. 12 US and 10 International Cottons were processed with AFIS and compared to the fabric samples. Fabrics were tested on the new Autorate (for dark specks) system and then compared to the hand-counted fabric data. The AFIS data showed promising relationships to the fabric data.

Bel, P., Xu, B. (Proceedings of the National Cotton Council Beltwide Cotton Conference. February 8, 2010)

IX. Fibre properties of Saw and Roller Ginned Naturally Coloured Cottons

Naturally coloured cottons have economic and environmental appeal because they do not require dyeing, but their fibres are not as long as white cottons. To determine the best ginning process, two Upland (G. hirsutum) colour cottons were roller and saw ginned following a complete block experimental design. HVI and AFIS analysis favoured roller ginning. It resulted in 0.7 mm greater HVI fibre length and 33% fewer AFIS fibre neps compared to saw ginning. This increase in fibre value may justify the higher cost of roller ginning.

Funk, P.A., Gamble, G.R. (Journal of Cotton Science, 13:166-173, 2010)

Ongoing Research Projects in the area of Ginning:

(1) Performance Evaluation of Cyclones Used in Modern Ginneries

(2) Design and Development of Barcode Technology for Tagging Cotton Bales

(3) Design and Development of Axial Flow Cotton Pre-cleaner

(4) Design and Development of Pneumatic Loading System for Double Roller Gin

(5) GIS Based Development of Spatial Fibre Quality Maps for Cotton Grown in Nagpur and Vidharbha Region of Maharashtra

GINNING SCENARIO

TECHNOLOGY MISSION ON COTTON

TMC - A Mission Partially Unfinished ?

Modernisation of ginneries has been a spectacular event in the history of the Indian ginning industry. Nearly 1000 G&P units have been modernized or newly set up under TMC's Mini Mission IV being implemented by the Ministry of Textiles through CCI. The scheme launched in February, 2000 is slated to come to a close by December, 2010. Factories, thus modernized through TMC together with around 200 units upgraded through TUF scheme will be ble to process about 240 lakh bales which constitute 80% of the cotton produced annually in India.

Impact of TMC: Modernisation of ginneries has had its beneficial effect on Indian Cotton which is now acknowledged by the textile industry as much cleaner, with acceptable levels of trash and contamination. Cotton trade is pleased to receive premium price for bales and ginners are delighted to get enhanced processing rates. TMC has encouraged indigenous manufacture of ginning and allied machines of innovative and energy-efficient designs.

Task Unfinished : The flip side of modernization reveals certain inadequacies that warrant further Government interventions. The TMC Scheme needs to be extended both in time and scope with specific objectives as noted below:

i) Northern States of Punjab, Haryana and Rajasthan as well as most parts of Andhra Pradesh that could not join the TMC bandwagon for certain region-specific reasons could be given another chance to modernize and rise to the level of Gujarat, Maharashtra and Madhya Pradesh, which have taken full advantage of TMC benefit.

ii) Southern states like Tamil Nadu, Karnataka and parts of Andhra Pradesh have small ginneries for which modernization of the scale contemplated by TMC was not affordable. A special package for tiny ginneries with 6-8 DR gins must be offered for the benefit of these states.

iii) Although many of the new G&P factories set up through TMC in Gujarat and Maharashtra were of a high technological level, existing units that underwent modernization through the scheme settled for a lower level of infrastructutal quality, having taken advantage of certain concessions in technical specifications offered by TMC to maximize participation. Such "Imperfectly modernized" G& P units can be given a chance to further upgrade themselves and become fully automated, world class ginneries.

The quanta of financial incentives, technology levels for upgradation and targeted number of units for each of the above three cases as well as the tenure for the fresh scheme can be decided after considering the country's overall requirements and taking due note of various constraints. It must be recognized that there are at least 2000 old ginneries in a primitive state deserving improvement or closure. The Textile Ministry should take a bold initiative in favour of the farmer.

Dr. K.R. Krishna Iyer, Consultant, TMC, MM-IV, Mumbai.

MEETINGS

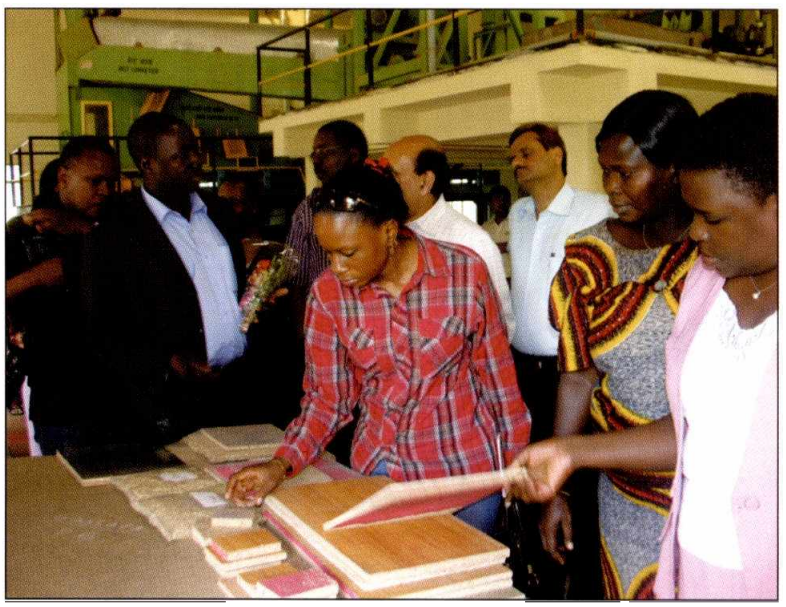
TRAINING AT GTC :

A training programme was conducted for trainees from the Cotton Corporation of India at GTC, Nagpur from 22.03.2010 to 26.03.2010 on Ginning and Quality Evaluation.

VISITS:

(1) Dr. M. M. Pandey, Deputy Director General (Engg.), Dr. S.K. Tandon, Asstt. Director General (Engg.), ICAR, New Delhi and Dr. Pitam Chandra, Director, CIAE, Bhopal visited GTC, Nagpur. Dr. T.S. Manojkumar, Scientist-in-charge explained the research activities of GTC and functioning of the Auto Grooving Machine.

(2) A seven member team from Uganda, comprising Mr.Olumn R. Reaagan MP, Chairman, Standing Committee on Commissions, Statutory Authorities and State Enterprises, Republic of Uganda, Mr. Samuel Semanda, Mrs.Jolly Sabunae visited CIRCOT, Mumbai and then GTC, Nagpur on December 21, 2009. The dignitaries were taken around the Centre and also to the demonstration plant for manufacture of Particle Board from cotton stalk. Dr. T.S. Manojkumar, Scientist-in-charge of the Centre gave demonstration of the particle board manufacture using cotton stalks and other research activities going on at GTC, Nagpur.



GINNERS SPEAK

Mr. Bharat Agarwal is one of the partners in M/s.Geeta Ginning and Pressing Industries, Dhule. Basically a commerce graduate tuned entrepreneur , Mr. Agarwal has vast experience in the field of cotton ginning and trading. Currently he is also working as the secretary of Khandesh Gin Press Karkhandar and Traders Development Association.

To begin with Mr. Bharat Agarwal started his business with an oil mill. During 2000 he happened to visit Gujarat with some ginners from Khandesh to look into the developments in the ginning factories. He was impressed with the infrastructure and ginning facilities available in those ginning factories. Besides this during that period there was large arrival of cotton in Khandesh and not enough ginning facilities were available. With that impetus he decided to start the ginning factory. He established a ginning factory with 24 DR gins with complete automation and a fully automatic baling press. This factory has been modernized under TMC.

Mr. Agarwal appears to be happy with the improved cotton quality currently produced by his ginnery in terms of contaminant free raw material with reduced trash and saving of labour. According to him the cotton bales are getting sold faster and supplemented by good premium. Mr. Agarwal hastens to add that proper and timely maintenance ensured lesser machine breakdown Proper monitoring of receipts and payments also helped him to run the unit smoothly and profitably.

According to Mr. Agarwal, the present ginning and auxiliary systems need to improve for efficient utilisation of power, fire related safety aspects and V Belts failures. He was of the opinion that use of V-belts in machines should be reduced to avoid the break down of the machines. Also there is an urgent need for use of automated fire control systems. He has also raised his concern about the increased power utilization at ginnery. Mr. Agarwal felt that research should be directed towards developing a DR gin machine that would have higher productivity with lower power consumption thereby reduce ginning cost but at the same time would have lesser break down incidents.

Mr. Agarwal emphasized on preserving and enhancing quality of cotton as the modern spinning mill is very keen on this issue. Quality cotton enables timely sale with premium in rates. For improvement in cotton quality use of pre-cleaners and lint cleaners is necessary and he was of the firm opinion that ginners should not bypass cleaners. The best management practices at ginneries along with display boards of do's and don'ts help in creating awareness among the workers for quality improvement.

Mr. Agarwal feels that research efforts to find simple and viable solutions for, moisturisation of cotton in Pala house, reduction in trash at farm level, reduction in power consumption in ginneries would go a long way in improving the viability of ginning as an occupation, and there is a felt need to reduce investments in plant and machinery.

Mr. Agarwal is of the opinion that the government should encourage specifically modernization of older ginning units with higher subsidy because a huge investment to the tune of two crores of rupees is required for establishing a ginning and pressing unit. A scheme similar to technology mission on cotton is to be formulated for establishing delinting plants and oil mills should be encouraged to do so. Mr. Agarwal has plans for the future for establishing a spinning mill and an oil mill. His message to the other ginners is to remain united for the betterment of the industry and be with the association.

During modernization of his factory; Mr. Agarwal had come in contact with CIRCOT Scientists and since then he has been closely associated with CIRCOT. In his opinion CIRCOT has played the role of a guide to perfection for the ginners about providing appropriate ginning technology, optimum modernization and has been able to create awareness on importance of cotton quality and training. He expressed his concern about the transient nature of trained ginnery staff members who keep on changing their job due to the seasonal nature of the vocation.

In his farewell remark, Mr. Agarwal urged all ginners to adopt newer technologies and work together for the betterment of the ginning industry.

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Published by Dr. S. Sreenivasan, Director, CIRCOT, Mumbai and Printed by Unity Printers, Wadala, Mumbai