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Speech of Shri Dhiren N. Sheth, President, Cotton Association of India at the 93rd Annual General Meeting on Wednesday, the 30th September 2015



Dear Members,

It is my proud privilege and a great honour to extend a warm welcome to you all at this 93rd Annual General Meeting of our Association.

You already have in your hands the Directors' Report and the Audited Accounts for the year ended 31st March 2015 along with the Auditors Report thereon, bringing out the financial statements and major activities undertaken by the Association during the year under review.

OUTLOOK FOR GROWTH IN INDIA IMPROVING GRADUALLY

The economy of India is the 7th largest in the world by nominal GDP and the 3rd largest by Purchasing Power Parity (PPP).

Against the backdrop of a negative to modest positive growth of the global economy, the Indian economy clocked a healthy growth rate of 7.3% in 2014-15 and is expected to grow by 7.5% - 8.3% in 2015-16. In fact, the Indian economy became

the world's fastest growing economy by eclipsing China in the last quarter of 2013-14.

During this year, Foreign Direct Investment (FDI) inflows have increased 33% to reach USD 17.34 billion during January-May 2015 compared to the same period last year. India's foreign exchange reserves were USD 353.5 billion in the week upto 31st July 2015, an increase of USD 33.5 billion over the past one year. India's Index of Industrial Production (IIP) grew by 3.8% in June 2015 compared to 2.5% in May 2015. This growth was largely due to the boost in manufacturing growth, which was 4.6% in June compared to 2.9% in the previous month. India continues to remain at the top of Nielsen's global consumer confidence index for the fifth quarter in a row. The country's confidence score rose 1 point from the previous quarter to 131 in the three months ended June 2015 which was highest in past 4 years. India's current account deficit has reduced sharply. India's Wholesale Price Index (WPI) inflation rate remained negative at 4.05% for the ninth consecutive month in July 2015 as against a negative of 2.4% in the previous month, led by low crude oil prices. India's Consumer Price Index (CPI) inflation rate fell to a eight-month low of 3.8% in July 2015 as compared to 5.4% in June 2015, led by a fall in fuel and Beverages Price Index.

The long term prospective of the Indian economy is moderately positive. The business confidence remains strong and it is heartening to note that the outlook for growth in India is improving gradually.

CAI Wishes All Our Readers A Happy Cotton Year 2015-16



AGRICULTURE CONTINUES TO PLAY A VITAL ROLE IN INDIA'S ECONOMY

Agriculture plays a vital role in India's economy. Over 58% of the rural households depend on agriculture as their principal means of livelihood. The share of agriculture and allied sector continues to decline in the GDP from 14.6% in 2010-11 to 13.9% in 2013-14 at 2004-05 prices.

However, agriculture continues to remain one of the largest contributors to the country's GDP.

As per estimates of the Central Statistics Office (CSO), the share of agriculture and allied sector was 16.1% in the Gross Value Added (GVA) during 2015-16 at 2011-12 prices. The country is the largest producer, consumer and exporter of spices and spice products. It ranks third in farm and agriculture output. Agricultural export constitutes 10% of the country's exports and it is the 4th largest exported principal commodity.

The agriculture sector in India is expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Factors such as reduced transaction costs and time, improved port gate management and better fiscal incentives would contribute to the sector's growth.

WORLD COTTON SCENARIO

As per the latest data released by the International Cotton Advisory Committee (ICAC), world ending stocks are estimated to have risen by 9% to 22 million tons, reflecting a stock-to-use ratio of 90%. From 2010-11 to the end of 2014-15, the world has accumulated 13.4 million tons of stock due to production exceeding consumption. In 2015-16, stocks are projected to decrease 5% to just under 21 million tons reducing the excess volume by around 1 million tons.

In 2014-15, the production was higher than consumption. However, in 2015-16, ICAC expects world cotton consumption to overtake production for the first time in five seasons. World production in 2015-16 is forecast down 9% to 23.8 million tons while the world consumption is projected to rise by 2% to 24.9 million tons in 2015-16.

DOMESTIC COTTON SCENARIO

The cotton sector in India has been making a steady progress. The acreage under cotton is estimated to have risen by over 10 lakh hectares to 129.71 lakh hectares in 2014-15 from 119.60 lakh hectares estimated in 2013-14. However, the acreage under cotton is expected to be lower in the 2015-16 season due to the lower realisation of prices by farmers for their produce in 2014-15. As per the CAI estimates, cotton crop for the 2014-15 season was 382.75 lakh bales as against 407.25 lakh bales in 2013-14. The crop for the ensuing 2015-16 season is also expected to be at the same level as in 2014-15. Cotton consumption in India is estimated to have grown by over 4% to 315 lakh bales in 2014-15. Export performance of the country in 2014-15 was below par and the country is estimated to have exported about 60 lakh bales in 2014-15 against 112 lakh bales in 2013-14. The country is estimated to have witnessed one of the largest closing stocks in the history as at the close of cotton season 2014-15.

Friends, it is a matter of pride for all of us that our country has surpassed China in terms of the production of cotton for the first time in 2014-15 to become the world leader. As per the data released by ICAC, production of cotton in China in 2014-15 is estimated at 6.48 million metric tons as against India's cotton production of 6.51 million metric tons for that year.

The cotton economy in India has witnessed depressing trends in 2014-15. The cotton prices ruled substantially lower during 2014-15 than those prevailing in the previous cotton season and the country witnessed a massive support price operation. The Government agencies have procured about 93 lakh bales under MSP operations.

CAUSE OF COTTON CONTINUES TO REMAIN SUPREME FOR CAI

Friends, 2014-15 was a special year for our Association since it was during this year that we have succeeded after years of hard work in launching the Pilot of our dream project, 'School Contact Programme (SCP)' in Mumbai with a target of 20 English medium schools. Of these 20 schools, we have already conducted SCP in 12 schools so far and it is a matter of gratification that the SCP



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has received an overwhelming response from the students, teachers and parents alike. The idea behind this initiative is to do our bit in arresting the declining trend of cotton consumption. The world-over, consumption of cotton is declining steadily compared to polyester and other manmade fibres. The SCP is aimed at inculcating in the students at an early stage a preference for the cotton fibre. SCP is an educational yet entertaining programme titled "Cottonology" wherein the school children are explained the History, Geography, Science of cotton and benefits of using the natural fibre cotton. The CAI has plans to expand this programme in Hindi and other regional languages also in future.

As a part of its cotton promotion initiative, the CAI also launched during 2014-15 a premium brand called 'Suvin Ratna' - The Jewel of Cottons! to support the production of Suvin cotton in the country. Suvin Ratna is a carefully selected shirting fabric made from Suvin cotton conscientiously cultivated by M/s. Appachi Eco-Logic Cotton Pvt. Ltd., Pollachi and expertly spun and woven by M/s. Morarjee Textile Limited by both its warp and its weft and containing 2/200s count yarn, which is one of the most exquisite count of yarn produced in the country. The CAI has taken care to ensure that the entire chain right from the farm to the fabric is fully traceable so that the end product can be certified to be made from authentic Suvin. Although, at present, Suvin Ratna is available only in white, CAI plans to incorporate other colours as well as checks and stripes in the fabric.

The CAI has also succeeded in conducting an international conference on cotton, Cotton India 2014 in Mumbai from 24th - 26th November 2014 after a gap of 8 years. With the participation of over 350 delegates from 21 countries and renowned speakers from India and abroad, Cotton India became an instant hit and established itself firmly in the international cotton calendar.

The Cotton Museum Project initiated by the CAI with a view to portray the rich and varied history of cotton and the development and promotion of cotton trade in India has also started gaining momentum. The CAI has engaged the services of an expert Dr. Nayana Tadvalkar, the Cotton Museum Associate to speed up the process of setting up of the proposed Museum. The CAI is in the process of identifying suitable space for Museum, setting up of a library and procurement of artefacts.

Friends, it is heartening to note that the continued efforts put in by the CAI in cotton developmental activities for the benefits of cotton farmers in Chopda (Maharashtra) and Raichur (Karnataka) through its research and extension wing, "COTAAP (Cotton and

Allied Products) Research Foundation" have started getting recognition and more importantly, financial assistance from the Government of Maharashtra. During the year, the CAI has successfully conducted Field Level Demonstrations (FLDs) of advanced technologies in cotton cultivation and post harvest handling. The area under cotton development in Chopda particularly High Density Planting of cotton undertaken under the PPP-IAD Project of the Government of Maharashtra in association with M/s. Mahyco Seeds and M/s. Arvind Mills Ltd. has increased to 1000 acres as against 350 acres in the last year. This has enabled the CAI to cover larger area under its cotton development programme and provide benefits to more number of farmers. Further, the CAI has implemented FLDs on Integrated Soil and Nutrition Management with a view to conserve soil fertility, COTAAP online to provide weather alerts and market rates of cotton to the farmers by sending daily SMS and various other activities like farmers rally, village meetings, Farmers Field Schools (FFS), etc. for the benefit of cotton farmers.

With a view to providing state-of-art cotton testing facilities in all cotton growing regions in the country in a cost effective manner, the CAI continues to expand its network of laboratories. The CAI has so far set up 10 laboratories and three new laboratories are in the pipeline.

THE ROAD AHEAD

THE NEED TO ADOPT NEW TECHNOLOGIES FOR IMPROVING COTTON PRODUCTIVITY

Despite a remarkable success story of cotton in India, productivity continues to remain a grey area. Although the productivity of cotton in India has achieved considerable growth from 278 kgs./ha in 2001-02 to over 500 kg./ha in 2014-15, the country has not made any notable progress and the productivity of cotton has somewhat stagnated during the last few years. The world average productivity of cotton in 2014-15 was 784 kgs./ha. The main reason for increase in productivity was the large scale adoption of GM technology in India and Technology Mission on Cotton. In order to provide impetus for further growth in productivity, the country needs a White Gold Revolution like the Green Revolution, which spurred a growth in the agriculture sector and enabled the country to achieve self-sufficiency, the White Revolution which made India the largest producer of milk in the world and played a leading role in improving the living standard of the rural poor and consequently, the rural economy and the Blue Revolution, which the country has launched for all round improvement in the fisheries sector.

Given the correlation between improvement in agriculture and reduction of poverty in rural India, the Government has planned several steps for the sustained development of agriculture. 'Soil health card' scheme to improve soil fertility on a sustained basis, improved access to irrigation through 'Pradhan Mantri Gram Sinchai Yojana', enhanced water efficiency through 'per drop more crop' are some of the welcome steps by the Government which are expected to give a boost to agriculture in general and the cotton sector in particular. Bollgard II Roundup Ready Flex (BGIIRRF) and High Density Planting (HDP) are two new technologies which if adopted in right earnest, can improve productivity of cotton in the country substantially.

BETTER INFRASTRUCTURE NEEDED TO CATER TO THE INCREASES CROP

With an increased crop size of about 400 lakh bales, India requires a huge infrastructure. The modernization of Ginning and Pressing factories, which was carried out under the Technology Mission on Cotton, now needs immediate follow up. Adequate warehousing facilities coupled with appropriate financing schemes also need to be provided across all the ten cotton growing states. Facilities for instrument testing of quality parameters of the entire crop also need to be critically looked at keeping in mind that the sampling for the purpose of testing, which is very low in India as compared to other countries like the USA where 100% sampling is the norm. Thus, testing facilities need to be increased substantially albeit in a gradual manner.

ACKNOWLEDGEMENTS

In the CAI 's progress during the year, it has been our privilege to be the recipient of the support and cooperation from the cotton fraternity from India and abroad and I would like to take this opportunity to acknowledge their valuable time. We are indebted to Shri. Santosh Kumarji Gangwar, the Hon'ble Minister of State for Textiles (Independent Charge) for his wise counsel to the CAI from time to time and the visits that he paid to the CAI on several occasions. Shri. Radha Mohan Singh, the Hon'ble Union Minister of Agriculture and Cooperation and Smt. Nirmala Sitharaman, Hon'ble Minister of State (Independent Charge), Ministry of Commerce & Industry have always been supportive to the cause of cotton and provided guidance to the CAI whenever needed. I indeed owe a debt of gratitude to them.

Shri. Siraj Hussain, Secretary, Ministry of Agriculture and Co-operation, Shri. Sanjay Kumar Panda, Secretary, Ministry of Textiles, Smt. Rita Tiotia, Secretary, Ministry of Commerce and

Industry, Smt. Anu Garg, Joint Secretary, Ministry of Textiles, Smt. Rani Kumudini, Joint Secretary, Ministry of Agriculture and Co-operation, Shri. Ravindra Singh, Secretary and Shri. Pramod Kumar Jain, Joint Secretary, Ministry of Culture have also been very helpful to the CAI and I can't thank them enough for their kind gesture.

I am also greatly indebted to Shri. Pravir Kumar, DGFT and Smt. Kavita Gupta, Additional DGFT for their wholehearted support to the CAI in general and me in particular in resolving several trade related issues.

I also take this opportunity to place on record my sincere thanks on behalf of the CAI and on my personal behalf to the Ministry of Consumer Affairs, Food and Public Distribution, Ministry of Shipping, Central Institute for Research on Cotton Technology, Central Institute for Cotton Research, Directorate of Cotton Development, Cotton Corporation of India, Textile Committee and the Office of the Textile Commissioner for their continued support to the cause of Indian cotton.

I am indeed indebted to all our members without whose valuable contributions, support and encouragement, it would not have been possible to overcome the various challenges faced during my tenure as the CAI President. I urge all our members to continue to lend similar support to the CAI in future.

Our thanks are also due to all our Upcountry Cotton Trade Associations and the Co-operative Cotton Marketing Societies, which have extended their wholehearted support and assistance from time to time.

I would also like to convey my sincere thanks to my fellow office bearers Shri. Bhadrash V. Mehta, our Additional Vice President and Shri. Rishabh J. Shah, Honorary Treasurer for sharing my responsibilities and making my task easier. I would not have succeeded in discharging my responsibilities as the President without the support of our Vice President, Shri. Nayan C. Mirani. Friends, it gives me immense pleasure to recognise his invaluable contribution. I am indeed thankful to you all.

I also express my appreciation of the hard work put in by our Secretariat. Last but not the least, it gives me a great pleasure to express my sincere thanks to the media for the timely coverage given to various activities of the CAI.

Thank you.

CAI extends a warm welcome to the office bearers for the year 2015-16



Shri Dhiren N. Sheth,
President



Shri Nayan C. Mirani,
Vice-President



Shri Bhadresh V. Mehta
Addl. Vice-President



Shri Rishabh J. Shah
Hon. Treasurer

CAI also extends a warm welcome to the newly elected members on its Board of Directors



Shri Amit M. Thakker



Shri Arvind S. Jain

Stable World Cotton Trade Expected in 2015/16

World cotton area is projected to fall 7% to 31.1 million hectares in 2015/16 due to significantly lower cotton prices in 2014/15. The world average yield is expected to decrease by 2% to 766 kg/ha due to disparate impacts of El Niño. As a result, world cotton production is expected to fall by 9% to 23.8 million tons. India's cotton area is estimated down 5% to 11.6 million hectares. India's average yield is forecast up 3% to 547 kg/ha, due to more timely monsoon weather, and production down 2% to 6.4 million tons. China's cotton production is set to decline by 16% to 5.4 million tons due to a 12% reduction in area and a 5% decrease in the average yield as a result of unfavorable weather in its largest cotton producing province, Xinjiang. After a 24% expansion in 2014/15, cotton area in the United States has receded 13% to 3.3 million hectares with production declining 11% to 3.2 million tons. Pakistan's production is projected down 11% to 2.1 million.

World cotton imports are projected to remain unchanged at 7.6 million tons in 2015/16. A decrease in imports by China is expected to be offset by increases in other countries. While China is likely to remain the world's largest importer in 2015/16, its imports are forecast to fall by 12% to 1.6 million tons. This represents 30% of its peak volume of imports in 2011/12. In 2015, the Chinese government restricted imports to the minimum volume required by the World Trade Organization to encourage mills to purchase domestic cotton. It also sold cotton from its reserve in July and August 2015, and total sales reached nearly 60,000 tons. However, the government still holds 11 million tons. Given the large volume of production and reserves, imports are likely to be restricted again in 2016. Meanwhile, imports by other countries are expected to grow 4% to 5.8 million tons. Imports in Bangladesh, Vietnam, and Indonesia, the next three largest importing countries, are all projected to grow in 2015/16. Mill use in these three countries has been steadily growing, but their sectors must rely on imports since all three produce

little to no cotton. Bangladesh imports are forecast to increase 1% to 972,000 tons while Vietnam's imports are forecast up 2% to 956,000 tons. After decreasing in 2013/14, Indonesia's imports recovered 13% to 735,000 tons in 2014/15, and are expected to increase 6% to 782,000 tons in 2015/16.

The United States is forecast to lead in export volume, although its exports are projected down 9% to 2.2 million tons due to a smaller volume of production in 2015/16. After declining 48% in 2014/15, India's exports may recover 34% to 1.2 million tons. Exports in the next three largest exporting countries are all likely to decrease due to reductions in their exportable surplus. Brazil's exports are forecast down 10% to 766,000 tons, Uzbekistan's down 5% to 565,000 tons and Australia's down 10% to 467,000 tons.

World cotton consumption could grow 2% in 2015/16 to 25 million tons with consumption growth remaining flat or slowing in many countries compared with last season. Consumption in China, the largest cotton consuming country, is expected to remain flat in 2015/16 at 7.7 million tons. India's consumption growth is expected to slow to 3%, reaching 5.6 million tons, while Pakistan's consumption growth remains steady at 2%, reaching 2.6 million tons. Turkey's consumption declined 2% in 2014/15 due to financial losses in some of its larger textile companies, but it is projected to recover 5% to 1.4 million tons in 2015/16. Consumption in Bangladesh rose by 6% to 937,000 tons in 2014/15, and is forecast to increase by 4% to 974,000 tons in 2015/16. Similarly, Vietnam's consumption rose by 22% to 847,000 tons in 2014/15, and is expected to increase by 13% to 953,000 tons in 2015/16.

World ending stocks may decrease by 5% to 20.6 million tons after 5 seasons of growth. After an 11% increase in 2014/15, stocks held outside of China are also projected to decrease by 5% to 8.7 million tons.

Source: ICAC Cotton This Month, October 1, 2015

The Three Mistakes in Cotton's Life

(Dr. K.R. Kranthi, Director of Central Institute for Cotton Research (CICR), Nagpur has completed his Ph.D in Entomology from IARI, New Delhi. He has more than 20 years of experience in the field of cotton research.)

Are there just three mistakes? Certainly not! How many I don't know, but in my perception this list of three is a recipe for disaster. You may not agree with me. Many may even strongly feel that this list of three actually holds the secret for successful cotton farming in India. But, discuss, we must, and argue, we will. This is an attempt to highlight at least three commonly known factors, which I am referring to, as mistakes, primarily with an intention to trigger a new way of thinking that may find new remedies. I must mention here that amongst the three mistakes the first one 'long duration varieties' is the actual monster and other two nurture the devil.

The three mistakes in tandem

1. Long duration varieties
2. Excess urea
3. Early use of systemic insecticides

Long Duration Varieties: The average crop duration in India is 210 days, which is about 30-50 days more than other major cotton growing countries. Long duration varieties (210-240 days) suffer from two major disadvantages. 1. The crop suffers moisture stress during boll formation and 2. The crop has a long vulnerable flowering window that invites bollworms. The long duration varieties also have excess foliage that serves as an excellent host for the sap-sucking insects. Cotton crop needs about 2 mm water and 0.5 to 1.0 kg/ha Nitrogen per day during vegetative phase and needs about 6-7mm water and 3-4 Kg/ha Nitrogen per day during flowering and boll formation stage. Thus longer the duration of fruiting phase, more is the demand for water and nutrients. In rain-fed regions of central India, when the crop is sown in July, flowering and boll formation stage in late duration varieties extends from mid-September to the end of November and sometimes even into December. Water and nutrient requirement is most crucial during this period. Nutrient uptake depends on the availability of soil moisture. In rain-fed regions of central India, rains recede by the second week of September and the soil becomes almost dry, especially in shallow soils, by the beginning of October. The crop suffers moisture and nutrient stress all through October and November and does not retain bolls properly. The

long 60-80 day flowering period from September to mid-November also invites bollworm moths continuously. Indeterminate varieties have excessive foliage all through until harvest. Sap sucking pests which are generally limited to early vegetative phase, continue into the flowering and fruiting phase if the crop continues to put forth fresh leaves, as it happens with indeterminate long duration varieties. Farmers are forced to spray insecticides all through the season. No other country has had to suffer insecticides in cotton as much as India did. Clearly this happened due to India choosing long duration varieties and farmers having to use more fertilizers and also spraying 14-28 applications per season.

EXPERT'S Column



Dr K.R. Kranthi

All cotton hybrid varieties in India are of indeterminate habit with a long duration that extends from 6 to 8 months at least. Hybrids inherently are endowed with hybrid vigour which makes them grow in a prolific manner during the vegetative phase, which makes them respond to fertilizers and water to put forth luxuriant and excessive foliage. This generally results in wastage of nutrients. This is also one of the reasons as to why cotton hybrids in India are planted at only 4000 to 6000 plants per acre. The plant density in major cotton growing countries across the world is 40,000 to 60,000 plants per acre. Hybrid cotton seed is very expensive at Rs. 0.15 per seed and is therefore planted at the low density. Because of the low plant density, each plant is expected to produce a large number of bolls per plant as opposed to a few number of bolls per plant in other countries. For example, each plant in India has to produce 100 bolls of 4g each to produce 1600 kg seed-cotton from 4000 plants in one acre. Whereas, in other countries where the plant density is 10 times higher at 40,000 plants per acre, each plant is expected to produce only 10 bolls of 4g each for a similar production of 1600 kg seed-cotton per acre. Plants in such systems take a short time of 15-20 days to complete flowering that is adequate to produce 8-10 bolls per plant. Thus the flowering phase is short and reduces the challenge of insect pests. The flowering in India is at least of 60-80 days duration which is in contrast to a much shorter flowering period in other countries. The short duration in other parts of the world has enabled countries to achieve higher per day productivity. They produce more cotton in a short time with less pest problems, due to a short flowering window and less need for fertilizers and water in a short reproductive window. There is no doubt that the long duration of cotton in India has

resulted in moisture and nutrient stress, more insect pests, diseases, need for more insecticides and low yields.

It is interesting that irrespective of India's low average national yields, many experts still believe that long duration varieties are best for India. The theory was that, if the early fruiting parts were damaged by bollworms, the crop would recover to produce new flush and thus continue to produce in an indeterminate manner, thus enabling risk aversion. The duration of such varieties extends beyond six months and can go on and on, even up to a full year, especially if water and nutrients are made available. In line with this theory, almost all the varieties developed in India were designed to be indeterminate. Needless to mention, cotton is basically an indeterminate crop. It has a perennial habit and many varieties can grow like trees, if left to survive. However in stark contrast, almost all the major cotton growing countries of the world, developed short duration varieties of 150-180 days, with determinate habit of synchronous boll formation especially to suit machine picking. Experts in India also believe that drip irrigation can solve India's problem of low yields, not just in rain-fed regions, but also in irrigated states of north India. Undoubtedly, drip irrigation saves water and fertilizers, in addition to enabling controlled application of water and fertilizers as and when needed by the plant. However, drip irrigation systems are expensive despite subsidies and need maintenance. How well these systems suit the marginal rainfed conditions of Vidarbha and Telangana is a matter of debate. Experts agree that countries which are harvesting 3-4 times higher yield than India have achieved high productivity levels not necessarily by using drip irrigation in their countries. The main technology that they have adapted to get high yields is 'Adjust Cotton Flowering Window to Fit into the Soil Moisture Regimen'.

Beyond doubt, India MUST develop short duration cotton varieties of 150-160 days duration, with synchronous boll formation of 8-10 bolls. Such varieties, if sown at a density of 40,000 to 50,000 plants per acre, earliest with the onset of monsoon in central India, can complete the short flowering and boll formation window for 8-10 bolls within a short span of time, before soil moisture become limiting, with the least requirement of water, nutrients and insecticides.

Urea Delays Flowering and Invites Insect Pests and Diseases: A sequence of events happen with urea application that actually push the crop into a problem that is not easily realised by farmers. When applied at the initial reproductive stage of 45-60 days after sowing, urea switches off the reproductive phase, triggers excessive foliage, delays flowering,

delays crop maturity and makes the crop conducive to sap sucking insects. These effects get aggravated when the crop suffers from deficiency of phosphorus (P) and potash (K). Studies across the globe clearly show that the uptake of water and nutrients in cotton plants is highest at 90-110 days after sowing, which is generally the peak boll formation stage. However in India, almost all fertilizer recommendations for cotton make a mention that at sowing time or at 20-25 days after sowing, half the recommended N+K and full dose of P₂O₅ should be applied as basal dose followed by application of the remaining half N+K at 45-60 days after sowing. About 5 tonnes of farm yard manure or 1.0 ton of compost per acre is recommended at sowing time. Since urea is heavily subsidised, it is cheaper and farmers use it extensively. There is a misconception in India, especially in north India that a lush green cotton crop at vegetative phase will produce high yields.

Application of excessive urea at the peak vegetative stage of 45-60 days after sowing, forces the crop to become lush green with excessive foliage. Under normal circumstances, a majority of the varieties or hybrids start producing squares from 45-60 days. This first part of the reproductive phase is disrupted due to urea application. With urea, the plants switch off 'squaring-flowering' and return back to the leafy vegetative phase. This delays flowering and maturity by at least 15-20 days. Phosphorus deficiency also causes delayed flowering and maturity. A combination of more urea and less phosphorus can result in a prolonged vegetative phase and delay in the initiation of squaring and flowering window. Further, urea application in a crop that suffers from deficiency of potash invites sap sucking pests such as leaf hoppers, thrips, whiteflies and aphids. Also, there are a few diseases that get triggered with urea application. With urea induced vegetation, sap sucking pests proliferate more rapidly in varieties / hybrids that are susceptible to sucking pests.

Many Systemic Insecticides Induce Crop Vegetative Phase and Delay Flowering: Insecticides that are absorbed by the plant and translocated to other parts of the plant are known as 'systemic insecticides'. Majority of the insecticides belonging to the organophosphate group, for example monocrotophos and acephate and the neonicotinoid group of insecticides, are systemic in nature and induce the crop towards the vegetative phase. Insecticides belonging to the 'organophosphate' group and the 'neonicotinoid' group are the ones that are recommended mainly for the control of sap sucking insect pests. Sap sucking pests occur in the early vegetative phase of the crop especially in varieties or hybrids that are susceptible. As mentioned earlier, urea application in 45-60 days



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ASSOCIATES THROUGHOUT THE WORLD

old crop triggers vegetative phase, delays flowering and invites sap sucking insects. Spraying some of the systemic insecticides during the early crop stage further induce 'vegetative leafy phase' and delay flowering and crop maturity. Early application of some insecticides induces insect pest outbreaks and necessitates repeated application of systemic insecticides for pest control, which further delays the flowering phase and crop maturity.

There are three ways in which some insecticides and tank mixes can cause insect pest resurgence.

1. Broad spectrum insecticides and mixtures kill naturally occurring biological control of insect pests.
2. Insecticide induced vegetative phase and physiological changes in plants that suit insect pests
3. Insecticide induced physiological changes 'hormoligosis' in surviving insects which lay fertile eggs in excess. Nature is endowed with many insect species that are known as parasites, parasitoids and predators which kill insects that feed on the crop. These insects are useful to the farmer and are generally referred to as 'natural enemies' or 'naturally occurring biological control'. Except a few insect growth regulators (IGR), botanical pesticides and biological insecticides, majority of the synthetic insecticides have a broad spectrum toxic action on naturally occurring biological control in fields. Some insecticides have a mild effect on natural enemies whereas a few have very strong effects. Insecticide tank mixes can have devastating effects on natural enemies that can easily result in insect pest resurgence. When natural enemies are destroyed by the insecticide and if the populations do not revive, insect pests get an advantage of easy survival, which results in insect pest resurgence. There are cases where a few insecticides alter the physiology of plants, which suits some insect species thus resulting in pest outbreaks. Yet another mechanism known as 'insecticide induced hormoligosis' also can result in insect pest outbreaks. Hormoligosis is a phenomenon whereby some insecticides cause physiological changes in surviving insects to an extent that the survivors lay fertile eggs in excess which leads to outbreaks. Application of broad spectrum systemic organophosphate and neonicotinoid insecticides to control the resurgent insect pests further delays flowering and crop maturity.

Conclusion : Cotton crop benefits most when it can take up nutrients at flowering and peak boll formation stage. Nutrient uptake happens only if the soil contains adequate moisture at the flowering and peak boll formation stage. In rainfed regions of Vidarbha and Telangana, soil moisture is generally available until end of September or mid October depending on the soil type. Deep black cotton soils retain more moisture compared to shallow soils.

Therefore in these rainfed regions, flowering in August and boll formation in September to mid October can help the crop to take up nutrients when applied, thereby leading to good boll setting, good retention and good yields. If the flowering gets delayed and happens over a long window that is spread over 50-80 days during September to November, boll formation gets further spread over during October to December. Flowers and bolls that form after mid-October suffer moisture and nutrient stress thus resulting in poor boll setting and low yields. Therefore any decisions and interventions that lead towards late flowering and late boll setting in cotton are to be considered as mistakes.

The first mistake is the choice of a system that aims at achieving more bolls per plant. More bolls per plant, means longer time of flowering and boll setting and long duration. The second mistake is the application of urea without adequate P and K. This intervention delays flowering further and extends the reproductive phase further into a weak soil moisture phase. Application of urea during the early squaring phase also invites sap-sucking insect pests. The third mistake is the sprays of systemic organophosphates and neonicotinoid insecticides which induce leaves, further delay flowering and in some cases, trigger insect pest resurgence thus necessitating more sprays and more delay in flowering and boll setting.

Therefore the keys to the success of cotton cultivation in the dry rainfed regions of Vidarbha and Telangana are:

1. Early sowing of early maturing varieties in June.
2. High density planting at 44,000 plants per acre with a target of 8-10 bolls per plant for an early narrow flowering window.
3. Intercropping with nitrogen fixing short duration legume crops such as green gram or black gram or cow pea or soybean. Legume crops fix nitrogen and support integrated pest management.
4. Application of balanced nutrients at peak flowering and boll setting stage.
5. Careful choice of ecologically acceptable pest management interventions mostly with bio-pesticides to ensure that the crop reproductive phase is uninterrupted and that the natural enemies are least disrupted.

Thus a narrow short flowering window of 15-20 days in August can help the squares and flowers to escape American bollworm that generally starts in September and also crop harvest before November helps the crop escape pink bollworm which starts in mid-November.

(The views expressed in this column are of the author and not that of Cotton Association of India)

UPCOUNTRY SPOT RATES (Rs./Qtl)												
Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]							Spot Rate (Upcountry) 2014-15 Crop SEPTEMBER-OCTOBER 2015					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	28th	29th	30th	1st	2nd	3rd
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	8548 (30400)	8548 (30400)	8464 (30100)	8464 (30100)		8464 (30100)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	8689 (30900)	8689 (30900)	8605 (30600)	8605 (30600)	H	8605 (30600)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	6889 (24500)	6889 (24500)	6889 (24500)	6833 (24300)		6805 (24200)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	7283 (25900)	7283 (25900)	7283 (25900)	7227 (25700)	O	7199 (25600)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	8239 (29300)	8239 (29300)	8239 (29300)	8183 (29100)		8155 (29000)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	9139 (32500)	9055 (32200)	8970 (31900)	9026 (32100)		8998 (32000)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	8127 (28900)	8070 (28700)	8070 (28700)	8070 (28700)	L	8070 (28700)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	8548 (30400)	8492 (30200)	8492 (30200)	8380 (29800)		8352 (29700)
9	P/H/R	ICS-105	Fine	27mm	3.5-4.9	26	9223 (32800)	9139 (32500)	9055 (32200)	9111 (32400)	I	9083 (32300)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	8352 (29700)	8295 (29500)	8295 (29500)	8295 (29500)		8295 (29500)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	8773 (31200)	8717 (31000)	8802 (31300)	8717 (31000)		8689 (30900)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	9364 (33300)	9280 (33000)	9195 (32700)	9251 (32900)	D	9223 (32800)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	8858 (31500)	8830 (31400)	8914 (31700)	8858 (31500)		8830 (31400)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	9139 (32500)	9055 (32200)	9139 (32500)	8942 (31800)	A	8914 (31700)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	9055 (32200)	8998 (32000)	9083 (32300)	8942 (31800)		8914 (31700)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	9476 (33700)	9280 (33000)	9364 (33300)	9083 (32300)		9055 (32200)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	9083 (32300)	9026 (32100)	9111 (32400)	8998 (32000)	Y	8970 (31900)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	9336 (33200)	9280 (33000)	9364 (33300)	9139 (32500)		9111 (32400)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	9645 (34300)	9589 (34100)	9673 (34400)	9420 (33500)		9392 (33400)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	12513 (44500)	12513 (44500)	12513 (44500)	12513 (44500)		12513 (44500)

(Note: Figures in bracket indicate prices in Rs./Candy)