

Weekly Publication of



**Cotton
Association
of India**

COTTON STATISTICS & NEWS

Edited & Published by Amar Singh

2016-17 • No. 22 • 30th August, 2016 Published every Tuesday

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Cotton Season: Predicaments of 2016

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In the last week of July 2016, the World Bank released its commodity markets outlook quarterly report 2016 <http://www.worldbank.org/commodities>. According to the report India would produce 6.45 million tonnes (38 m bales of 170 kg/bale) cotton fibre this season in 2016-17. In the backdrop it is relevant to take a look at cotton yields in 2015-16. The Cotton Advisory Board had recently revised the production estimates of last year (2015-16) to 33.8 m bales (5.75 million tonnes) from an area of 11.9 m hectares. Thus the World Bank report estimates that India's cotton production would increase by 12.0% this year over the previous one. It is nice to be optimistic but it is good to be realistic. However, ground realities actually do not seem to support the hypothesis.

Cotton yields primarily depend on weather, pests, diseases and management practices. Weather in 2015-16 was good in almost all the cotton growing states of the country. Monsoon arrived on time and rains were almost evenly distributed. Ideally with such good conditions, the production should have reached at least 38.0 m bales from an area of 11.9 m hectares. Instead, cotton production halted at 33.8 m bales. Cotton lint yield was 482 kg per hectare. For the first time in eleven years the yield declined to less than 500 kg lint per hectare. The whiteflies in North India and pink bollworms in Gujarat played truant. Estimates from ICAR-

CICR, Nagpur indicate that the whitefly menace in North India may have caused production losses of 1.23 million bales equivalent to 0.21 million tonnes of fibre worth about 0.4 b US\$. The pink bollworm may have caused production losses of more than 3.5 million bales equivalent to 0.59 million of fibre worth 1.14 b US\$. Pink bollworm caused a major dent in Gujarat, because of the favourable long duration cotton crop that extends for a total duration of 7-8 months or even more in the field.

I earnestly hope that the World Bank estimates come true and farmers harvest higher yields. The prices are looking good and may continue to look skyward because of the global static consumption, decline in area, decreasing yields and the depleting stocks. With optimistic estimates, this year cotton area could reach about 10.5 m hectares to produce 5.1 to 5.27 million tonnes. The production could be affected if cotton in Gujarat is not protected well from the pink bollworm onslaught.

EXPERT'S Column



Dr. K.R. Kranthi

North India: Cotton in north India is cultivated in 1.4 to 1.5 m hectares completely under irrigated conditions. Whiteflies and leaf curl virus transmitted by whiteflies are the two major problems confronting the region. Prior to 2006, hybrid cotton area was negligible in North India. The best time for sowing is during mid-April to mid-May. This year more than 80.0% of the cotton area was sown in time before the stipulated date, 15th May in North India. However, the cotton area in North India was 30% less this year as compared to 2015-16. The cotton area was restricted to 0.26 m ha in Punjab (lowest in six decades), 0.49 m ha

in Haryana and 0.38 m ha in Rajasthan. The area was reduced in North India mainly because of the whitefly scare.

Last year, whitefly appeared in an epidemic proportion mainly in Punjab and a few other parts of North India. The insect outbreak was due to a combination of factors such as late sowing, congenial weather, excessive irrigation and urea, indiscriminate sprays of insecticide mixtures, insecticide resistance in whiteflies, weeds and other host crops such as legumes and citrus grown in vicinity. More than 50% of the cotton in Punjab was sown late by 15-30 days. Cotton sowing was delayed either because of the late release of canal water or in some cases because of delayed wheat harvest in some regions. Late sown crop has more tender foliage in July-August when the weather conditions are congenial for whitefly and leaf curl virus transmission. Early sown crop suffers less because of mature leaves which are not preferred by whiteflies. Further, our surveys showed that whitefly damage was most severe wherever farmers applied insecticides excessively, most of which were insecticide cocktails of different groups of insecticides. Insecticides worth US\$ 23 m were used indiscriminately in Punjab. Farmers of Punjab were paid compensation of US\$ 98 m in 2015.

I spent a week in North India last month. Timely sown cotton hardly showed damage symptoms from whitefly infestation. Leaf curl virus disease that is transmitted by whiteflies was negligible on timely sown cotton. To surmise, this year the whitefly menace was efficiently tackled in majority of the area in North India with simple yet effective strategies such as:

- 1) Timely sowing before 15th May
- 2) Hybrids/varieties tolerant to whitefly & leaf curl virus
- 3) Avoidance of excessive nitrogenous fertilizers
- 4) Implementation of Insecticide Resistance Management (IRM) and Integrated Pest Management (IPM) strategies.

IPM/IRM strategies included regular pest scouting and monitoring followed by interventions at economic threshold levels (ETL) of 6 whiteflies per leaf. The sequential interventions were a) Yellow sticky traps, b) water sprays, c) neem oil sprays d) neem based pesticides followed by e) sequence of softer chemistries of different modes of action such as pyriproxifen / buprofezin / spiromesifen / difenthiuron. Unlike last year, farmers hardly sprayed any chemical insecticides initially in the season. Neem based pesticides were used mostly until mid-July. Flonicamid was recommended when

leaf hoppers and whiteflies occurred simultaneously. Farmers were advised to strictly avoid insecticides to which whiteflies had developed resistance and also to avoid insecticide mixtures and any other insecticides that disrupt beneficial insects that strengthen naturally occurring biological control. The whitefly problem was significantly reduced this year in North India. The crop is relatively much healthy.

Whitefly infestation was slightly higher this year only in Abohar and Fazilka districts and that too only on hybrids that were late sown or were not listed as tolerant or were sprayed with organophosphate chemical insecticides. Whitefly infestation was more in cotton crop that was grown near orchards or paddy fields which were being frequently sprayed with chemical pesticides. However, the crop condition is good and yield reduction due to whitefly is expected to be less. The prevailing weather conditions during May to July 2016-17 were not very different from the conditions that were prevalent during the same time in 2015-16. The main difference was that the crop was sown very late last year and majority of the hybrids sown were susceptible to whiteflies and the leaf curl virus. Much of the credit for efficient management of the whitefly menace should go to the Vice-chancellors, scientists and staff of Punjab Agricultural University (PAU), Haryana Agricultural University (HAU), staff of the State Agricultural Departments of both the states, officials of the Ministry of Agriculture and scientists of the ICAR-CICR regional station at Sirsa. They truly deserve accolades for the excellent efforts that curbed the whitefly menace this year. Interestingly the area under Desi cotton (*Gossypium arboreum*) species increased suddenly to 72,280 hectares from a meagre 3000 hectares area over the past few years in North India. Desi varieties such as CICR-1, CICR-2, CICR-3, HD-123, FDR-124, LDR-949, Vijani-61, RG-8, LD-327, SV-385 etc., were in demand. The area would have been more, if seeds of the Desi varieties were available. Desi cotton varieties were preferred not just because of high yields with low inputs, but also because of their immunity to the dreaded leaf curl virus and resistance to whiteflies.

Central India: Gujarat and Maharashtra have the largest cotton acreage in the country. Cotton is grown in 4.2 m hectares in Maharashtra and in 2.9 m hectares in Gujarat. Madhya Pradesh has 0.6 m hectares under cotton. Almost all of the Bt-cotton in Gujarat is cultivated with protective irrigation, while 20% of the area which is under *Gossypium herbaceum* is rain-fed. About 90% of the cotton area in Maharashtra is rain-fed. More than 60% of cotton in Madhya Pradesh is under irrigation. Pink

bollworm has recently emerged as a major problem for Bt-cotton in Gujarat and irrigated regions of Maharashtra and Madhya Pradesh.

Gujarat: Gujarat is the largest contributor to India's cotton. During the last 10-12 years, with just about one-fourth of India's cotton acreage Gujarat's contribution was 30-36% to the country's total cotton production. Cotton sowing was slow in Gujarat. Monsoon arrived late. Water in check dams was less. Until 27th July 2016, the rainfall deficit was -50% in the state. The deficit was acute at -60 to -67% in the main cotton growing districts such as Surendranagar, Jamnagar, Rajkot, Bharuch, Ahmedabad and Vadodara which together constitute more than half of the 2.9 m hectares of cotton area in Gujarat. Reports show that at least about 50% of the area was sown timely. An area of about 1.36 m hectares was sown before 11th July and about 1.77 m hectares were sown before 18th July. Over the past three years Gujarat had sown cotton in 2.8-2.9 m hectares each year. The total area in 2016 may reach 2.1 to 2.3 m hectares. Late sown cotton is likely to get into the grip of pink bollworms.

Gujarat's cotton productivity of 622 kg lint per hectare in 2015-16 was the lowest in 12 years and 11.0% less than the 12 year average. In 2013-14, the production was 12.4 m bales from 2.52 m hectares; in 2014-15 it was 1.12 m bales from 2.77 m hectares and in 2015-16, 9.4 m bales were obtained from 2.76 m hectares. Based on the yield levels of 2013, it is estimated that 13.6 m bales should have been harvested from 2.77 lakh hectares of area in 2014-15 and 2015-16. In predominantly irrigated tracts such as the ones in Gujarat, there are no major reasons except the pink bollworm damage for the yield decline in these two years. Thus the losses on Bollgard-II due to 'Bt-Resistant pink bollworm' were estimated to be 2.8 m bales in 2014-15 and 3.5 m bales in 2015-16 in Gujarat. With Rs. 4000 per 100 kg seed-cotton, the financial losses could be US\$ 0.89 billion in 2014-15 and US\$ 1.1 billion in 2015-16.

This year, Gujarat's cotton crop must essentially be protected from the pink bollworm to ensure good yields in the state.

Maharashtra: Cotton is a major crop in the state with about 4.2 m hectares. More than 90% of the area is under rain-fed conditions. Production depends mainly on the timely arrival of monsoon, distribution of rainfall and management interventions. Monsoon arrived in Maharashtra on 23rd June, considered to be 10-15 days late. Rainfall was evenly distributed for the subsequent 20 days. Thus far as on 27th July 2016, cotton sowing was completed in 3.7 m hectares

in the state. More than 80% of the crop was timely sown before the stipulated date 15th July. Good rains are predicted across the State through the season and good yields can be expected. However, pink bollworm in central Maharashtra may cause yield losses albeit to a minor extent. The intensity of pink bollworm was more in the irrigated tracts of central Maharashtra. Last year, pink bollworm damage was high in Jalgaon and severe in Dhule and Nadurbar. Yield losses in these districts could have been close to 20-25% due to the boll damage in the second-third pickings of cotton, which was estimated at 40,000 bales worth US\$ 12 million in the three districts. The cotton in Vidarbha region was terminated by mid December in the majority of the region. Therefore losses due to pink bollworm were very less.

The state may contribute 8.0 m bales this year from an area of 3.6 to 3.8 m hectares.

Madhya Pradesh: Monsoon arrival was delayed by about 20 days. Good showers were received only after the last week of June. The cotton area ranges from 0.5 to 0.7 m hectares in the state. This year sowing was almost normal and reached 6.0 lakh hectares. Production may be about 1.5 to 1.6 m bales from 0.5 m hectares.

South India: Historically, prior to 2007, the cotton area was about 1.3 to 1.8 m hectares in the southern region, including Orissa. The area started increasing from 2007 onward and doubled to 3.0 to 3.6 m hectares over the past four years. Concomitantly, production also doubled to more than 10.0 m bales after 2012.

Telangana: Monsoon arrived on 24th June in the state. More than 95% of cotton in the state is grown under rain-fed conditions. Rainfall distribution has been reasonably good so far in the state. Official communications were issued to discourage farmers from taking up cotton sowing in the state. Until 30th July, a total area of 1.16 m hectares was sown under cotton. This year, the total area reached 1.25 m hectares as against the normal 1.77 m hectares. Last year, cotton production was 5.8 m bales from 1.77 m hectares. Pink bollworm did not cause much concern in the state thus far. This year, Telangana may contribute about 3.8 m bales from an area of about 1.3 m hectares.

Karnataka and Andhra Pradesh: The two states grow cotton in 0.6 to 0.7 m hectares each. Karnataka and Andhra Pradesh experienced a slightly erratic distribution of rains, but sowing started in time. Sowing continues until mid-August in some parts

of the region. As on 26th August, 2016, cotton area touched 0.37 m ha in AP and 0.49 m ha in Karnataka, because of the shift towards pulses. Pink bollworm is likely to cause damage mainly in the irrigated regions, especially in the hybrid seed production regions where the crop is extended for 3-4 months beyond the normal 6 month duration. Cotton is cultivated in about 0.13 m hectares each in Orissa and Tamil Nadu (TN). Cotton production in the two states may reach 0.3 m bales. Production from the southern region may reach about 10 m bales from the total combined area of 3.0 m hectares including Karnataka, AP, TN and Orissa.

Conclusion: “A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty” –Winston Churchill.

Cotton is at a very crucial stage in the country where difficulties are slowly mounting and yields are declining gradually irrespective of the presence of some of the best technologies. At this point of time

it is very important that we search for answers in the difficulties themselves. What kind of break-through is India’s cotton waiting for? Our highway looked smooth over the past 10-15 years. We were thirsty and thought that we had found water everywhere. If we do not understand the mirage we will only be destined to run and run thirsty all along.

Albert Einstein once remarked. “Only those who attempt the absurd can achieve the impossible.” Looking towards our own native “Asiatic cotton varieties for long term sustainable answers for our problems” may appear absurd at this point of time but it is our surmounting difficulties that would pave the way towards nature’s own remedies, as it happened in North India this year. Desi cotton is making a come-back. I earnestly look forward to some exciting changes in the near immediate future.

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