

Awareness, perception and acceptability of Bt cotton seeds among cotton growing farmers in India

Summary of findings



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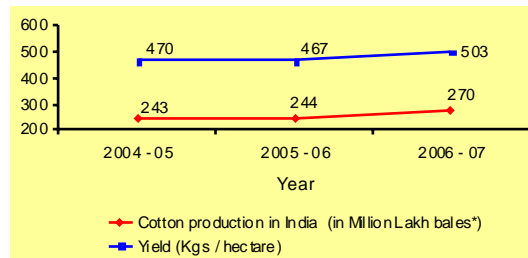
Currently, India accounts for around 18% of the world's cotton production

World Cotton Production						
Country	2002-03	2003-04	2004-05	2005-06	2006-07 October	% Share
China	22.6	22.3	29.0	26.2	29.0	24.9
United States	17.2	18.3	23.3	23.9	20.7	17.8
India	10.6	13.8	19.0	19.2	21.0	18.0
Pakistan	7.8	7.8	11.1	9.9	10.1	8.7
Uzbekistan	4.6	4.1	5.2	5.6	5.5	4.7
Brazil	3.9	6.0	5.9	4.7	5.3	4.6
Other Countries	21.6	22.9	26.8	24.8	24.8	21.3
World Total	88.3	95.2	120.3	114.3	116.4	100%

Source : US Cotton Market Monthly Economic Letter - October 2006

Production figure in bales where 1 bale = 480 pounds = 218 Kgs

Over the last year, cotton crop production and yield has increased by 11% and 6% respectively in India



Source: Cotton Advisory Board, India

* 1 bale = 170 Kg (for these production figures)

Area under Bt cotton crop cultivation as a percentage of total area under cotton crop cultivation has also increased tremendously

- ✓ Year 2004-05 : 6.2%
- ✓ Year 2006-07 : 39%

(Source: ISAAA)

Bt-cotton crop failure in some parts of India has attracted negative publicity

Cotton farmers to get compensation

New India Press, January 22 2007
<http://www.newindpress.com/NewsItems>

Five Maharashtra farmers commit suicide

Indo Asian News Service, January 15 2007
<http://www.dailyindia.com/show/103537.php/Five-Maharashtra-farmers-commit-suicide>

Five cotton-growers in Vidarbha region of Maharashtra have committed suicide after crop failure, taking the number of such to 33 since the New Year.

THE Bt [Cotton] TRAGEDY THAT STRUCK DHARMAPURI [Tamil Nadu]
 PASUMAI VIKATAN, 3/1/2007

"Looks like we have to pluck our nose with this cotton."

Farmers gaining more from growing Bt cotton

K.V. Kurmanath, The Hindu Businessline,

In this backdrop, there was a need to identify the reasons for financial distress of farmers in major cotton growing clusters

Our study sought to answer the above questions by addressing the following **key research objectives**:

- ✓ To determine the **awareness of Bt Cotton category of seeds** and various certified and non-certified Bt cotton brands
- ✓ To gauge the **farmers' perception and satisfaction** with ordinary, hybrid and Bt cotton seeds
- ✓ To identify the **factors causing financial distress** among the cotton growing farmers
- ✓ To determine the **likelihood to purchase/ continue using Bt cotton seeds** and Genetically Modified fruits and vegetables by cotton farmers in future

Research Methodology

Module 1 : Quantitative survey with farmers

- **A random selection of cotton growing farmers was undertaken as per the following sampling plan:**
 - ✓ Large cotton growing belts in Western, Central and Southern Zone of India were identified
 - ✓ Selection of farmers for detailed interview was undertaken as per the following key considerations
 - ❖ *Area under cotton crop cultivation by the farmer*
 - ❖ *Category of cotton seed cultivated by the farmer (Bt, Hybrid non-Bt, ordinary)*
 - ✓ A statistically valid sample of 911 farmers were interviewed

Area under cotton / No. of farmers	Western / Central Zone				Southern Zone	
	Maharashtra	Gujarat	Madhya Pradesh	Andhra Pradesh	Tamil Nadu	Karnataka
1 – 2 acres	49	55	56	54	46	34
2.1 – 5 acres	81	71	62	81	23	33
5.1 – 10 acres	37	43	45	38	15	23
More than 10 acres	15	19	17	8	6	0
Total	182	188	180	181	90	90

Coverage of various districts

- Overall, 23 districts were covered across 6 states. The sample size was equally distributed across various sub-clusters within each state.
- At the state level, the following sub-clusters (districts) were covered:-

Maharashtra	Gujarat	Madhya Pradesh
Buldhana	Baroda	Dhar
Yeotmal	Rajkot	Khargone
Jalgaon	Bhavnagar	Khandwa
Akola	Jamnagar	Harda
Wardha	Khera	
Nagpur		
Tamil Nadu	Karnataka	Andhra Pradesh
Salem	Bijapur	Warangal
Coimbatore	Gadag	Guntur
		Kumool
		Adilabad

Qualitative insights were generated by way of in-depth interviews with key stakeholders

Module 2: Expert interviews with cotton farmers and other stakeholders

- Out of the total 29 expert interviews, twentyfour interviews were conducted with Bt cotton farmers. Two interviews with seed shops and three interviews with Scientists and Professors were also conducted
- The key issue addressed through these interviews was obtaining deep understanding of the reasons for financial distress amongst farmers

Zones Covered	States Covered	Sample Size
Western / Central Zone	Maharashtra	16
	Gujarat	6
Southern Zone	Andhra Pradesh	7
	TOTAL	29

Study Findings

1	Awareness of Certification
2	Perception for various seed categories
3	Satisfaction levels with seed categories
4	Reasons for financial distress
5	Productivity Expectations & Returns
6	Concept test for Bt fruits/v egetables

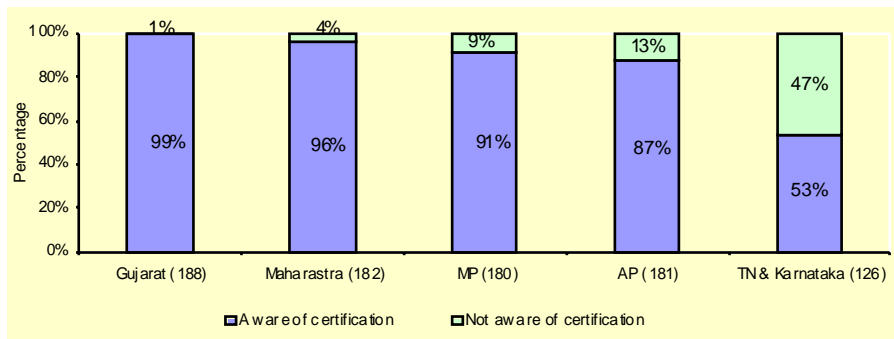


Awareness of Bt cotton seeds

- ✓ In TN-Karnataka cluster, awareness level of Bt cotton category was an issue with around 30% of the farmers were not even aware of the Bt cotton category.
- ✓ Across other clusters, almost all the farmers were found to be aware of 'Bt cotton' seed category, as shown in the table below :-

	Maharashtra	Gujarat	MP	AP	TN & Karnataka
Base	182	188	180	181	180
Aware of Bt cotton seeds	100%	100%	100%	100%	70%
Not aware of Bt cotton seeds	0%	0%	0%	0%	30%

Awareness of certification of Bt Cotton seeds is a cause of concern in the Southern Zone



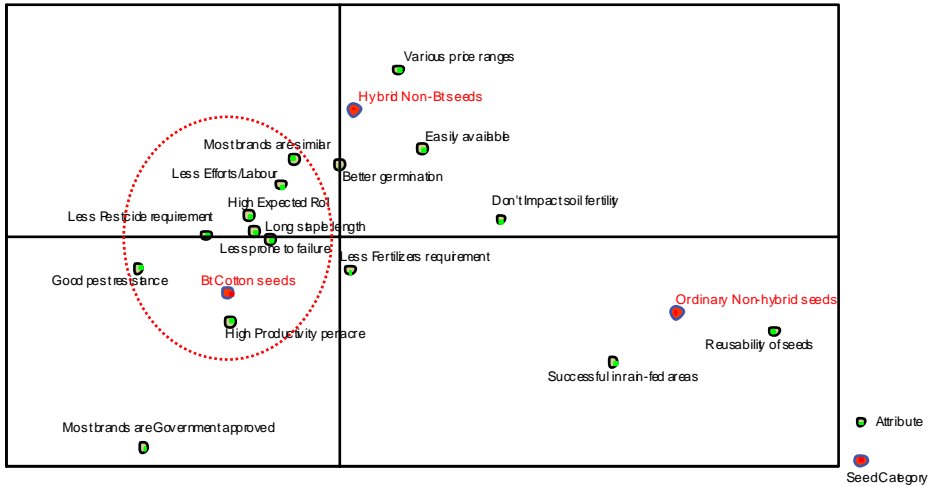
- ✓ Low level of awareness of certified Bt Cotton seeds results in farmers purchasing spurious brand Bt cotton seeds which leads to lower yield

Study Findings

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Farmers perceive Bt cotton seeds better than other seed categories on most attributes



Perception of Bt cotton seeds

Return Related		Bt cotton is associated better with return related factors, e.g. Return on Investment and Quantity of output per acre.
Input Related		Bt cotton seed is perceived to be a high yield seed category if sufficient quantities of inputs e.g. fertilizers and water are provided
Quality Related		Perceived to be a good cotton quality producing seed with a long staple length as the size of the cotton fruit is better. Is seen to have better pest resistance than other seed categories.
Availability Related		Has positive association in terms of its availability. Also, perceived to be lesser prone to crop failure vis-à-vis other seed categories.

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Overall Satisfaction levels with various seed categories

Clusters	Mean Satisfaction Scores (Out of 5)		
	Ordinary	Hybrid Non-Bt	Certified Bt
All 5 clusters	4.14	3.96	4.36
M.P.	4.72	4.33	4.78
A.P.	4.33	3.8	4.66
Gujarat	-	4.41	4.64
TN-Kar	3.79	4.33	4.60
Maharastra	-	3.29	3.33

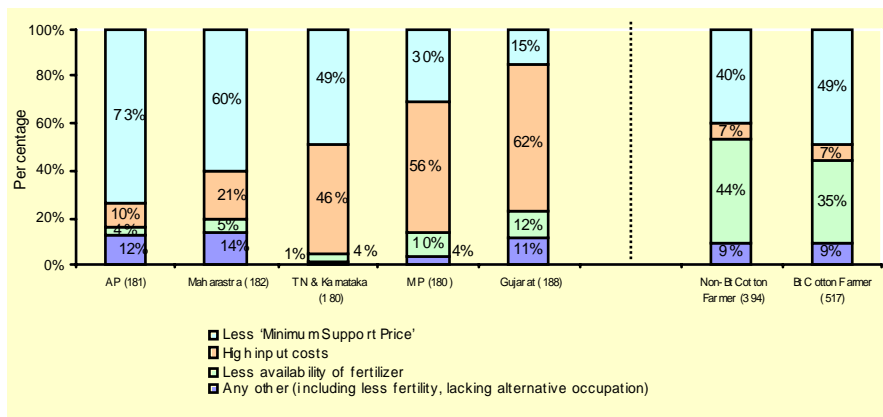
- Across all the states, mean satisfaction scores of the farmers using Bt cotton are considerably higher than those of non-Bt hybrid and ordinary seed users.

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Reasons for financial distress



- In AP & Maharashtra, low Minimum Support Price is the most important reason for financial distress, as cited by the cotton growing farmers.
- In contrast in Gujarat and MP, farmers consider high input costs to be the major reason for distress.

Reasons for financial distress – What farmers say?

"Suicides happen because of :-

1. Improper financial planning
2. Family/personal conflicts
3. Loan waivers off; farmer considers it as an easier exit option
4. Family gets ex-gratia payment of Rs 1 Lacs."

"There was a suicide case... the reason highlighted was 'Bt cotton crop failure'. But the actual reason was something else..."

"... this village is less prone to suicide as here farmers have two occupations - farming and cattle farming (milk selling)."

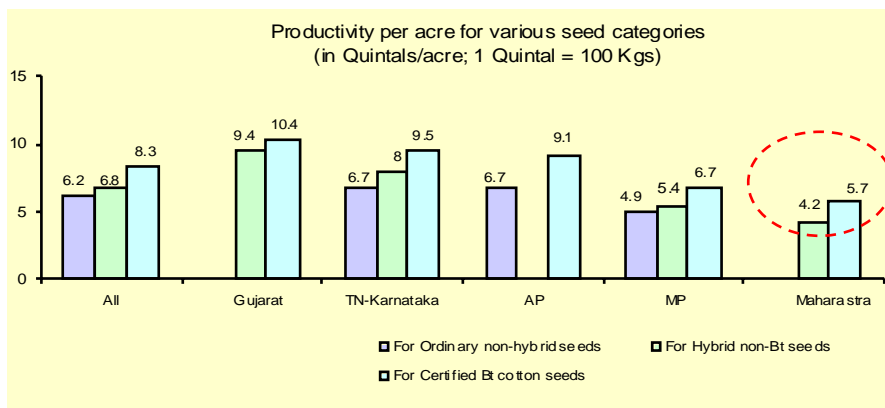
".. I know a person... The reason for suicide was inability to pay last years' Rs 15000. On the top of that he took Rs 20000 this year."

Study Findings

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- 4 **Reasons for financial distress**
- 5 **Productivity Expectations & Returns**
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Productivity expectations per acre – Bt cotton vs non-Bt seeds



- Across all the 5 states, productivity expectations with certified Bt cotton were higher than non-Bt hybrid and ordinary cotton seeds.
- But only higher productivity won't provide the true picture. Expenditure incurred is also critical. Hence, it is important to see productivity in the light of total expenditure incurred.

Return on Investment (RoI) is higher with Bt cotton seeds when compared with other seeds

Activities	Maharashtra		Gujarat		Andhra Pradesh		TN & Karnataka	
	Hybrid non-Bt seeds	Bt cotton seeds	Hybrid non-Bt seeds	Bt cotton seeds	Ordinary non-Bt seeds	Bt cotton seeds	Hybrid non-Bt seeds	Bt cotton seeds
Total expenditure per acre	4156	5271	8370	9348	7453	9290	9020	10228
Return in Rupees per acre	6720	9120	15040	16640	10720	14560	12800	15200
(Assuming average rate of Rs 1600 per quintal between Nov 06 to March 07)								
Profit per acre	2564	3849	6670	7293	3268	5270	3780	4973
Profit as percentage of investment	62%	73%	80%	78%	44%	57%	42%	49%

- Return on Investment of certified Bt cotton seeds is much higher than non-Bt hybrid seeds.
- Total expenditure head includes cost of seeds, fertilizer, pesticide and labour which account for 80% of the total expenditure

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Concept test for Bt fruits/ vegetables

In this survey, we also probed the farmers' intention to purchase and likelihood to recommend certified Bt seeds (with the farmers who are using it presently).

About Bt Technology:

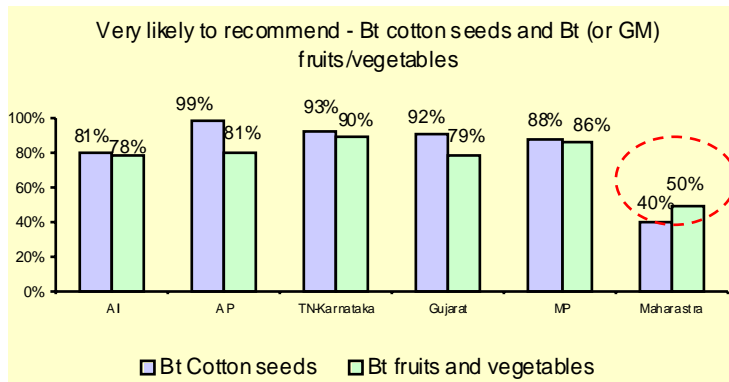
In this technology of seed production, a gene is injected to the seed for breeding. This gene is either naturally present in the environment or further modified by various companies to provide desired benefits according to the crop where it has been injected. This technology can be used to develop the seeds of various fruits and vegetables. Hence, the desired benefits can be brought to various fruits and vegetables. These fruits & vegetables are similar to ordinary fruits and vegetables in looks and taste and are certified by Government of India for safer use.

Benefits of Bt fruits and vegetables:

- Better nutritional value
- Better shelf life
- Homogeneous and better looks

However, Bt fruits and vegetables may be available at 10% - 20% higher prices of the prevailing fruits and vegetables.

Likelihood to recommend – Bt cotton and Bt fruits/vegetables



- In Andhra Pradesh, an overwhelming 99% farmers were 'Very likely' to recommend Bt Cotton to other farmers in the coming crop cycles.
- As far as purchase of 'Bt (or GM) fruits and vegetables' is concerned, TN-Karnataka and Madhya Pradesh clusters lead with 90% and 86% of the farmers 'Very likely' to recommend it respectively.

In a nutshell...

- ✓ There is a need to build awareness and educate farmers about the benefits of certified/ genuine Bt cotton seeds
- ✓ More awareness of correct farming practices (especially in the pest resistance area) needs to be built
- ✓ Better minimum support price from the Government and easier availability of credit at reasonable interest rates from nationalized and co-operative banks shall lead to lowering of distress among farmers
- ✓ Other measures such as introduction of crop insurance shall also be effective
- ✓ The government should emphasize the need for alternate sources of income for farmers and support farmers in developing alternative occupation opportunities such as cattle farming

Thank you!