

Promotion of Bt cotton through Institutional approach in Perambalur district

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Introduction

Perambalur district, location in the central part of Tamil Nadu State is well known for its cotton cultivation since 1990. During that time the area under cotton was around 19000 ha and the same had reduced to 1000 ha during 2002 due to severe incidence of pink boll worm and white fly due to indiscriminate use of synthetic pyrethroids that might have built resistance and resurgence in pests. The cotton farming society of Perambalur had no other option but to take the decision of changing their cropping pattern by switching over to maize and hence the area under cotton in Perambalur had drastically reduced. During 2003-04, KVK Perambalur played a pivotal role in addressing the pest's problem in cotton through strategic approaches which paved way for regained prospects of cotton crop and the area under cotton gradually increased to 20273 ha in 2008-09 with an average productivity of 20 to 22 q / ha.

Problem scenario

KVK Perambalur took proactive role by making field level study to understand the ground realities of cotton production in the district. Series of field visits, interaction meetings with farmers, studies involving Participatory Rural Appraisal (PRA) techniques were done to gain insight on the problems and the opportunities for initiating development interventions. The series of efforts taken by the KVK team found out the following problems associated with cotton production at field conditions.

- 1) Severe incidence of pest especially the boll worms attack during critical crop growth phases.
- 2) Nutritional disorders in plants due to the low fertility status of soil that could not support for better crop stand.
- 3) Lack of awareness among cotton farming community about alternative options like Bt technology to address boll worm problems.
- 4) Non availability of quality seeds or better pest resistance varieties.
- 5) Lack of knowledge on strategizing effective pest control measures by farmers

Varieties used in Perambalur district

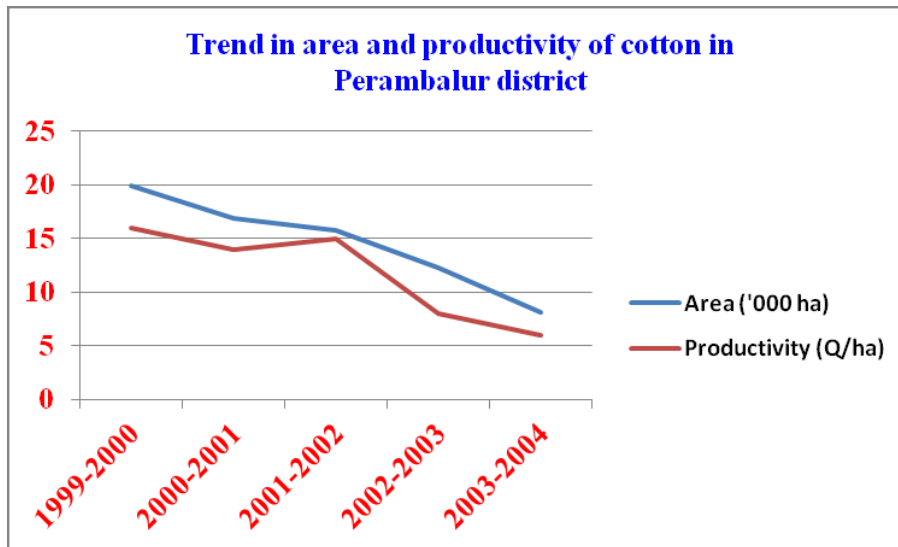
Before introduction of Bt

Many farmers were growing cotton year after year and they used hybrid seeds too, but realized only marginal amount of additional yield and income. The return was non remunerative due to poor yield (12 q /ha) and higher cost of pesticides. Such situation resulted in change of their decision not to go for cotton cultivation due to its low return and higher expenditure. Pesticides occupied more share of expenditure and the same became reason for disintegration of farm. The average cost of cultivation was Rs. 30000 / ha. But the net income they realized was only Rs. 5000 / ha. Finally they decided to shift to maize crop. During that period the following varieties of cotton viz., MCU 5, MCU 7,9,10,11, LRA 5166, K9,10,11,Suvin,Jayalakshmi,TCHB213, SVPR1,2,Paiyur 1, Savitha, Hp 224, KC2 were widely cultivated by the farmers.

Table 1: Area and productivity of cotton in Perambalur district

Before introduction of Bt cotton		
Year	Area ('000 ha)	Productivity (Q/ha)
1999-2000	19.96	16
2000-2001	16.85	14
2001-2002	15.78	15
2002-2003	1.23	8
2003-2004	0.809	6

Table 1 indicated a reduction in trend of cotton area and productivity levels in Perambalur district. Field visits and constant interactions with the farmers confirmed that the area came down drastically every year due heavy incidence of pest like boll worm resulting in drastic reduction in productivity levels and the expenditure incurred for plant protection significantly increased and hence cotton growing farmers decided to adopt for alternative cropping pattern.



Intervention by KVK Perambalur

KVK Perambalur carefully analyzed the situation and assessed the options available for immediate interventions. Accordingly, it was decided to adopt Bt cotton as technological option to address the major problem of boll worms infestation. It took its first level of effort in building awareness among cotton farmers about the menace of boll worm infestation and its management. Along with that a package of practices like seed treatment, soil test based fertilizer application, sucking pest management, nutrient management, growth hormone application and other agronomic practices were also emphasized to adopt so as to ensure integrated effort in addressing cotton production related problems simultaneously. Field days and media focus were given more intensively to ensure Bt technology to spread across cotton farmers through their society.

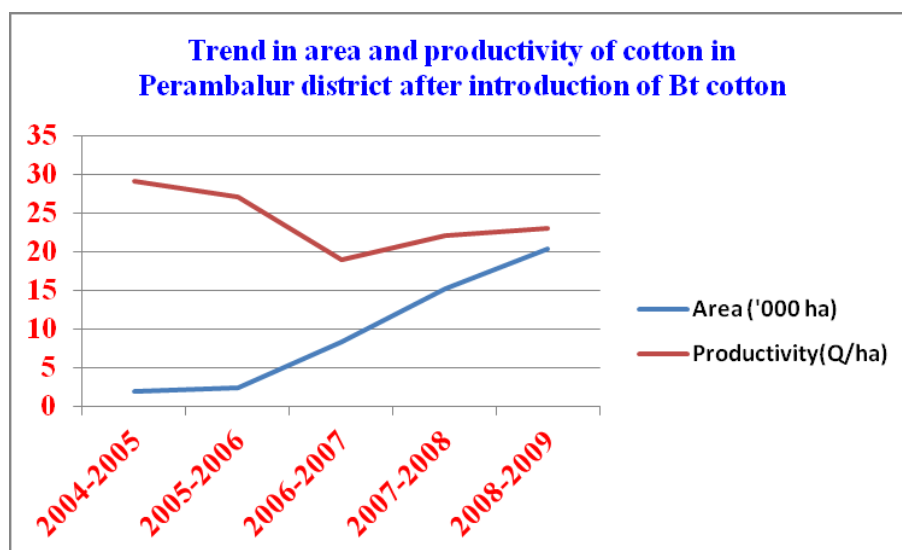
Change in farmer's decision in varietal use

After the entry of Bt

The series of efforts taken through training, demonstrations, awareness program, building awareness vide mass media by KVK Perambalur supported the farmers to decide upon alternate varieties to tackle the boll worm problems. They started using Bt cotton on trial basis to test verify its performance and later entered into full adoption. Farmers of the district started adopting the following varieties. RCH Bt -2, RCH Bt 20, MRC 6918, MRC 7918, RCHB708BG2, MRC7351, JK, Durga, GK-207, G209, Brama, Ankur, Akka Bt, Ajit-BG-2 etc.

Table 2: Area and productivity of cotton in Perambalur district

After introduction of Bt cotton		
Year	Area (ha)	Productivity(Q/ha)
2004-2005	1.89	29
2005-2006	2.40	27
2006-2007	8.38	19
2007-2008	15.19	22
2008-2009	20.27	23



It is quite evident from above that the area under cotton, exhibited an increasing trend due to introduction of Bt cotton. The Bt technology worked well as these varieties did not attract boll worms, pesticide spray reduced, the yield and net return increased and the same motivated farmers to continue the use of Bt cotton in their farm which led them to lead healthy life.

The following details reflect on various efforts taken by the KVK in resuming cotton cultivation in Perambalur district.

Table 3: Year-wise Training programme organized by KVK Perambalur (2006-2009)

S.No	Year	Activities	No of programmes	Total no of participants
1	2006-2007	(a) Training	2	60
		(b). Radio announcement	2	Mass
		(c). Demonstration	4	114
2	2007-2008	(a.) Training	7	167
		(b). Radio announcement	4	Mass
		(c). Demonstration	4	98
		(d).Field Day	1	55
3	2008-2009	(a.) Training	10	219
		(b). Radio announcement	5	Mass
		(c). Demonstration	6	57
		(d).Field Day	7	Mass
		(e).Newspaper coverage	5	128
		(f).Group meeting	6	58
		(g).Diagnostic visit	6	88
		(h).Advisory service	1	21
		(i).Field visit	25	55
		(j).T.V.programmes	2	Mass
		(k).Film show	2	Mass
(l)Popular activities	1	Mass		
(m)Publication	1	Mass		

During the early phase of Bt cotton entry, people were reluctant to accept the innovation and adopt the same in their field. The scientists from the KVK created the awareness about Bt hybrids. The continuous efforts taken by the KVK paved way for changing the mind sets of farmers and they got convinced about the technology. Now they

are getting an average seed cotton yield of 22 q / ha and realize better net return /ha due to lesser expenditure for the pesticides.

Impact

During the awareness stage, demonstration, on farm testing, etc were done and laid down the trials on Bt cotton to involve farmers to experience its reliability and performance. There were also series of interactive sessions held to bring the farmers to the stage of conviction and thereon to adopt the Bt technology. Slowly farmers started adopting such Bt

Success story: Mr. L. Srinivasan is a marginal farmer living in V.R.S.S. Puram village use to cultivate cotton in his farm years together which was his main livelihood crop. But, of late he could not realize sufficient income through cotton cultivation, the mainly due to intensive boll worms attack. He tried many ways but could overcome the situation and left cotton cultivation without any option. But his income earning opportunity became remote and the income earning status became very low. He had a very important responsibility of sending his son for B.Pharm studies. He left with no other option but to sell his 2 acres of rainfed land to tide over the situation and met out his son's educational expenditure. Of late, he was selected as one of the FLD farmers under KVK plan and had participated in various training activities on Bt cotton conducted by KVK. The Bt technology became a perfect solution for his problems and used it to circumvent his recession period. He started cultivating Bt cotton in his lands and reaped bumper yield of 16 to 17 q/ha realizing good net return. Of late, this helped him to support his son's higher study of M.Pharm, his agriculture scenario changed with purchase of more farm support systems like Tractor, Rotovator etc. Bt cotton cultivation has helped him to recover from dwindling living status towards income stabilization and prosperous livelihood condition.

variety in small scale during trial stage seeing the relative advantage in terms of pest attack and the incurred expenditure. Due to the introduction of Bt the area under Bt cotton in Perambalur district has increased to 20273 ha which would also increase further in future.

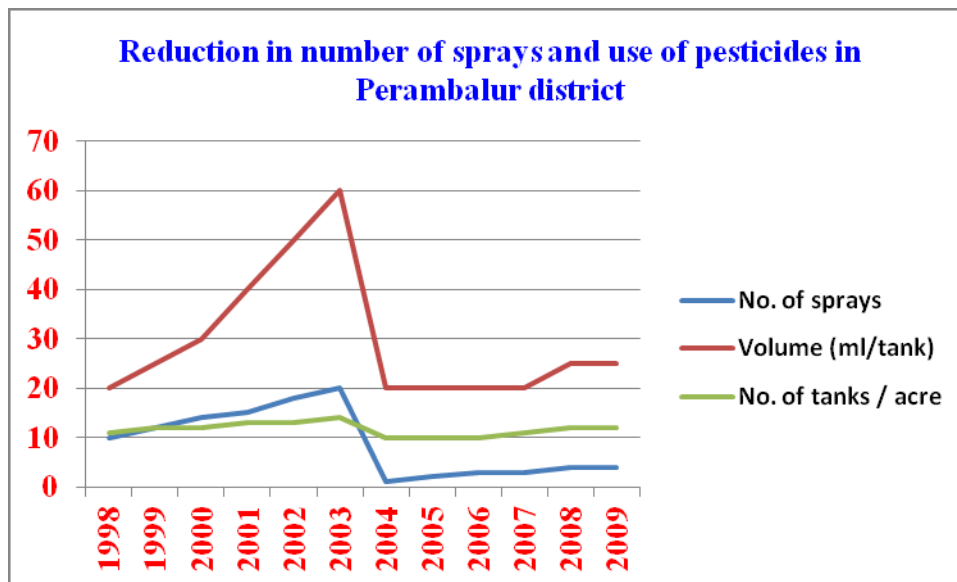
Then the message from fellow farmers spread to their peer groups on its own and through KVK's field day efforts as well. Now-a-days cotton farmers become so proficient in deciding upon specific hybrids among Bt innovation based on their performance. The reduction in pesticide spray not only reduced their expenditure but also its load to the environment and deleterious effects on human being. In addition net income from Bt cotton hybrids has increased which enabled the farmers to purchase new farm implements, land and animals also. The cost of cultivation is reduced to 35%, number of pesticide spray and quantity of chemical also declined, nutrient deficiencies have been overcome and the yield is increased to 61%. The income increase realized was Rs.40000 – 50000 / ha

Achievements under cotton production technology rainfed conditions

Year	Varieties		No .of demo	Area (ha)	Average seed cotton yield (Q/ha)		% increase in Yield	Cost of cultivation (Rs)		BCR	
	Demo	Check (non Bt)			Demo	check		Demo	Local check	Demo	Local
2006-07	RCH Bt-2	RCH2	25	10	31.52	19.50	61.64	21115	26780	2:90	1:42
2007-08	RCHB-708	RCH-708	45	18	22.77	15.34	48.43	19150	18765	3.38	2.23
	BG-I Suvin	BG-I Suvin	5	2	8.11	6.18	31.22	13758	16308	1.68	1.08
2008-09	MRC6918	RCH 708	25	10	19.10	12.26	55.79	25450	22720	2.04	1.50

Pesticide reduction status of Perambalur district

Year	No. of sprays	Volume (ml/tank)	No. of tanks / acre
1998	9-10	20	11
1999	10-12	25	12
2000	12-14	25-30	12
2001	12-15	30-40	13
2002	14-18	40-50	13
2003	18-20	50-60	14
2004	1	20	10
2005	2	20	10
2006	2-3	20	10
2007	2-3	20	11
2008	3-4	20-25	12
2009	3-4	20-25	12



Summary

Cotton cultivation was widely adopted in Perambalur district during 1999 -2000. But the same had significantly reduced due to heavy incidence of boll worms reducing the productivity and profitability. Efforts were taken by KVK Perambalur for introduction promotion of Bt cotton through strategic research and extension measures adopting the principles of Technology Assessment and Refinement and the same had led to increase in area under cotton in the district and the economic prospects of cotton farmers had increased significantly in Perambalur district in Tamil Nadu.