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KNOWLEDGE OF FARMERS, CONSTRAINTS FACED AND SUGGESTIONS OFFERED ON INTEGRATED MANAGEMENT OF PINK BOLLWORM IN COTTON: A CASE OF SAURASHTRA REGION, GUJARAT

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ABSTRACT

The present study was conducted on 200 cotton growers of Jamnagar and Devbhumi Dwarka districts to evaluate for knowledge of farmers about integrated management of pink bollworm in cotton. The respondents were middle age group (57%), educate higher secondary level, big farmers having nuclear family, main occupation was agriculture and animal husbandry. Krishi Vigyan Kendra or University level information for organic farming, printed literature and demonstration with 85.25, 37.08 and 22.71 weightage mean, respectively. They received guideline from Krishi Vigyan Kendra (53.33%) followed by Agricultural University (43.33%) and seed/pesticide dealer (30.83%). The knowledge about integrated management of pink boll worm were Grazing sheep & goat after harvest the crop (72.25%), Cotton stalk should be burned after picking (68%), Spraying of Beauveria bassiana (65.5%) and spinosad (62%), use of light trap (61%) and collection of infested flowers/ bolls and destroyed it (59.5%). Very rare farmers have knowledge on life cycle of pink bollworm (8.5%) and deep ploughing for management (6%). High cost of pesticide (96%), fragmented holding (90.5%) and heavy attack of pink bollworm (86.5%) are major constraints faced by the cotton growers. Genetic resistant variety (82%), Install pheromone & light trap near ginneries, market yard for mass trapping are the major suggestions for overcome the pink boll worm problem.

Keywords : *pink bollworm, cotton, pheromone trap, light trap, beauveria*

INTRODUCTION

India is a unique among the cotton growing countries of the world are grown commercially under diversified ecosystem. Cotton is an important fiber as well as oilseed crop. Cotton crop occupies enviable place amongst commercial crops of our country. With nearly 9.3 million hectares, India ranks first in the world in area and third in production with 13.28 million bales, and an average productivity 243 kg/ha (Singhal, 1999). About 6 million farmers cultivate cotton and about 40-50 million people are directly or indirectly employed by the cotton industry accounts for around 59% share of the raw material consumption of the Indian textile industry.

Further, Gujarat stands second in respect of area (1.479 million hectares) and first in respect of production (2.758 million bales) in India with productivity of 317 kg/ha (Singhal, 1999).

Several factors responsible for low yield. The plants suffer from the ravages of insect pests and production both in terms of quantity and quality are jeopardized. The cotton ecosystem is very complex (Sarwar, 2016; 2017) and the gelechiid moth of genus *Pectinophora* in the family Gelechiidae of order Lepidoptera may be associated with cotton (Sarwar et al., 2013). Among 162 species of insects and mites that associate with cotton (from seedling to harvest of the crop) in India (Anonymous, 1989). The average loss estimated was 38.98 to 60.42 per cent due to pest complex (Panchabhavi *et al*., 1990). Among bollworms, american bollworm (*Helicoverpa armigera* (Hubner)), spotted bollworm (*Earias vittella* (Fabricius) and *E. insulana* (Boisduval)) and pink bollworm (*Pectinophora gossypiella* (Sauders)) infesting cotton, pink bollworm (*Pectinophora gossypiella* (Sauders)) became a very serious threat to crop production. Since last three year pink bollworm is became headache for farmers. Present investigation carried out during 2018 for determination knowledge of farmer about integrated management practices of pink bollworm in cotton.

The pink bollworm *P. gossypiella* is one of the world's most destructive insect pests that causes terrible damage to cotton bolls. Moths are dirty brown in colour, about 5 mm in length and measuring almost 12-20 mm across the wings. Adults are small, greyish brown and inconspicuous moths. When their wings are folded, they have an elongated slender appearance. The wing tips are conspicuously fringed with hairs. Forewings are much longer than wide, with a fringe

of hair-like scales beginning from the middle of the posterior edge of the wing, continuing around the tip and terminating on the front edge about ¼ or 1/3 the length of the wing from the tip. The forewing terminates in a pointed tip that may be obscured by the fringe scales which may give the appearance of a flat-tipped wing. The hind wing has broad fringe about as long as the width of the wing along the hind margin and curving around the anterior margin where it is no more than half the width of the wing in length. The distal end of the hind wing has a sigmoidal or s-shaped curve producing a sharp point on the anterior edge (Silvie and Goze, 1991). Under optimal conditions, the entire life cycle is completed in 25-31 days and there may be four to six generations per year. The mature larvae are either 'short-cycle' and will go on to pupate or 'long cycle' to enter a state of diapause. Short cycle larvae pupating may cut a round exit hole through carpel wall and fall to ground and pupation is inside a loose fitting cocoon. Under cool dry conditions, *P. gossypiella* larvae may undergo diapause in a small cocoon in partially opened bolls in cotton lint, stored seed, and plant debris or in the soil (Metcalf and Metcalf, 1992). Hence the seriousness off the pink bollworm pest it is required to study the following objective for farmers.

OBJECTIVES

(1) To study the socio-economic character of the selected cotton growers

(2) To access the source of information by cotton growers

(3) To know the knowledge level of cotton growers on pink bollworm management and constrains faced by them

(4) To seek suggestion from cotton growers to overcome such constraints

METHODOLOGY

Krishi Vigyan Kendra, Junagadh Agricultural University, Jamnagar working in Jamnagar and Devbhumi Dwarka district. The study was under taken by the KVK in all 10 blocks, out of 10 Block six (Jamnagar, Jodia, Dhrol, Kalawad, Lalpur and Jamjodhpur) from Jamnagar and four (Jam Khambhalia, Jam Kalyanpur, Dwarka and Bhanvad) from Devbhumi Dwarka district were selected. Randomly two villages were selected from each block. Ten cotton growers from each villages were selected for the present study. Total 200 farmers were selected by proportionate random sample method. In light of the objectives, the interview schedule was prepared and respondents were interviewed at their home and field. The data collected by personal interview method were processed, tabulated, classified and analyzed in light of objectives (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

The present study was conducted on 200 cotton growers of Jamnagar and Devbhumi Dwarka districts to evaluate for knowledge of farmers about integrated management of pink bollworm in cotton. The data to statistical analysis and results are presented as per the objectives of study as below.

Socio-demographic characteristics

Table 1. Socio-demographic characters of cotton growers (n=200)

Sr. No.	Particulars	Frequency	Per cent	Mean ± S.D.
1	**Age group**			
	Young (18 to 35 Years)	29	14.50	30.85 ± 5.795
	Middle Age (36 to 50 Years)	114	57.00	
	Old Age (Above 50 Years)	57	28.50	
2	**Educational status**			
	Post Graduate	12	6.00	
	Graduate	17	8.50	
	Higher secondary	85	42.50	
	Secondry	58	29.00	
	Primari	23	11.50	
	Illiterate	05	02.50	

Sr. No.	Particulars	Frequency	Per cent	Mean ± S.D.
3	**Size of land holding (Total)**			
	Marginal (<1 ha)	08	04.00	4.44 ± 5.43
	Small (1.1 to 2 ha)	35	17.50	
	Medium (2.1 to 4 ha)	66	33.00	
	Big (>4 ha)	91	45.50	
4	**Family Type**			
	Nuclear	143	71.50	
	Joint	57	28.50	
5	**Family Income**			
	Up to ₹ 25000	17	08.50	
	₹ 25000 to ₹ 50000	12	06.00	
	₹ 50001 to ₹ 100000	114	57.00	
	Above ₹ 100000	57	28.50	
6	**Milch Animal Possession**			
	Cow	63	31.50	
	Buffalo	140	70.00	
	Others	0	0.00	
	Both (Cow + Buffalo)	105	52.50	
	Without animal	46	23.00	
7	**Occupation**			
	Agriculture	78	39.00	
	Agriculture & Animal Husbandry	108	54.00	
	Agriculture labour	12	06.00	
	Labour	02	01.00	
8	**Residence**			
	Pakka House	114	57.00	
	Kachcha House	29	14.50	
	Mix (Half Pakka + Half Kachcha)	57	28.50	
9	**Extension Participation**			
	Low extension participation (Below 0.48)	30	15.00	3.105±2.62
	Medium extension participation (0.48 to 5.73)	126	63.00	
	High extension participation (Above 5.73)	44	22.00	
10	**Social Participation**			
	Low Social participation (Below 0.68)	30	15.00	3.35±2.65
	Medium Social participation (0.68 to 5.99)	122	61.00	
	High Social participation (Above 5.99)	48	24.00	

Note : Figures in parenthesis indicates frequencies in number of participants

The results disclosed in Table 1 indicate that more than half (57 %) of farmers were from middle age group, followed by 28.5 per cent from old age and remaining 14.50 per cent of them were in young age group. The data indicated that 42.50 per cent of the farmers were educated up to higher secondary level, whereas 29 and 11.5 per cent of the farmers were educate up to secondary and primary level. However, very few were illiterate (2.5%) and very low were post graduate (6%) and graduate (8.5%).

According to land holding 45.5 per cent of the farmers were big farmers. However, the farmers were medium, small and marginal having 33, 17.50 and 4 per cent,

respectively. In this era of nuclear family, farming business were done on cooperative basis of their cousins and siblings. Though, joint farmer's family type were found 28.50 per cent whereas only 71.50.50 per cent were farming in nuclear type. The same way 57 per cent farmers of them were in annual income between ₹ 50000 to 100000, followed by 28.5 per cent (above ₹ 100000), 8.5 per cent (below ₹ 25000) and 6 per cent (₹ 25000 to 50000). Majority of the farmers (70 %) were kept buffalo, 31.50 per cent farmers kept cow, 52.5per cent having cow and buffalo and only 23 per cent farmers having no any animal keeping. According to occupation along with 54 per cent farmers having both agriculture and animal husbandry to gather, 39 per cent farmers have alone farming business. The category of residence 57 per cent of the farmers having pakka house, 28.50 per cent have mix (half pakka + half Kachcha) house and 14.50 per cent have kachcha house.

According to participation of above half of farmers (63%) of them were medium extension participation, 22 per cent were high extension participation and very few (15%) of them were low extension participation. Same way, in social participation, 61 per cent of them were medium, 24 per cent were high and 15 per cent were low participation.

Mass media exposure

The majority of farmers were using tools of mass media. The following table 2 show the results about the use of mass media means for communication for the management of pink bollworm management.

Table 2 : Mass media exposure (n=200)

Sr. No.	Mass media exposure	Regularly (3)	Frequently (2)	Once in a week (1)	Not at all (0)	Wt. Mean	Rank
1	**Radio**	03	19	60	118	26.75	VI
2	**Television**	06	31	71	92	37.75	IV
3	**News paper**	02	22	65	111	28.75	V
4	**Printed literature**	26	63	66	45	67.5	II
5	**Agril. Exhibition**	0	18	47	135	20.75	VIII
6	**Demonstration**	02	35	85	78	40.25	III
7	**University level (KVK)**	34	95	49	22	85.25	I
8	**Kisan call centre**	07	11	50	132	23.25	VII
9	**Any other**	0	04	40	156	12	IX

It can be concluded from table 2,KrishiVigyan Kendra or University level information for cotton cultivation practices on pink boll worm management were rank first (85.25%), followed by second printed literature (67.5%), third demonstration (40.25%), fourth television (37.75%), fifth newspaper coverage (28.75%), sixth radio (26.75%), seventh kishan call Centre (23.25%), eighth agricultural exhibition (20.75%) and lastly any other means (12%).

Use of information sources

Majority farmers having different source of information according to their requirement for pink boll worm management in proper way studied in table e were presented below

Table 3 : Information Source (n=200)

Sr. No.	Sources of information	Wt. Mean	Per cent	Rank
A	**Formal sources**			
1	Village level worker Agril. Extension officer	46.00	23.00	IV
2	SMS/Sub-divisional officer	10.00	05.00	XII
3	Service of co-operative society	17.33	08.67	X
4	Agricultural University	86.67	43.33	II
5	Agricultural Research Stations/KVK	106.67	53.33	I
B	**Informal sources**			
6	Neighbors	37.33	18.67	VI

Sr. No.	Sources of information	Wt. Mean	Per cent	Rank
7	Fertilizer Depot	45.67	22.83	V
8	Progressive farmers	22.67	11.33	VIII
9	Local leader	16.67	08.33	XI
10	Seed/pesticide dealer	61.67	30.83	III
11	Demonstrations	21.67	10.83	IX
12	Self-experience/experimentation	35.00	17.50	VII

Pink boll worm management proper guideline were taken from KrishiVigya Kendra or Agricultural Research Station and it come on first rank of information provide to farmers (53.33%) followed by Agricultural University (43.33%) Rank II. However, seed/pesticide dealer (30.83%) stand on third rank, village level worker/Agricultural Extension officer (23.00%) stand on fourth position. The subsequent information source decrease chronologically were fertilizer depot (22.83%), Neighbors (18.67%), Self-Experience/experimentation (17.50%), progressive farmers (11.33%), demonstration (10.83%), Service of cooperative society (8.67%), local leader (8.33%) and lastly SMS/Sub divisional officers (5.00%).

Knowledge of farmer about integrated management of pink bollworm in cotton

The respondents were asked to show their opinion for the following listed area of information of pink boll warm management.

Table 4 : Knowledge of farmer about integrated management of pink bollworm in cotton (n=200)

Sr. No.	Areas of Information	Frequency	Percentage	Rank
1	Identification of Pink Bollworm	39	19.5	XXIII
2	Life cycle of Pink Bollworm	17	8.5	XXVIII
3	Nature of damage of Pink Bollworm	21	10.5	XXVI
4	Control measures for Pink Bollworm			
	(1) Cultural Practices			
	(i) Deep ploughing	12	6.0	XXIV
	(ii) Timely sowing	72	36.0	XVIII
	(iii) Using refugia crop	84	42.0	XIV
	(iv) Removal of weeds/Wild okra weed	107	53.5	VIII
	(v) Cotton stalk should be burned after picking	136	68.0	II
	(vi) Collection of infested flowers, bolls and destroyed it	119	59.5	VI
	(vii) Grazing sheep & goat after harvest the crop	145	72.5	I
	(viii) Selection of early mature variety/Short duration variety	90	45.0	XI
	(ix) Avoiding ratooning of crop	31	15.5	XXV
	(x) Following dense cropping system	20	10.0	XXVII
	(xi) Using drip irrigation system	76	38.0	XVII
	(2) Mechanical measures			
	(i) Use of pheromone trap @ 5/ha for monitoring of pink bollworm	109	54.5	VII
	(ii) Use of pheromone trap @ 40 /ha for mass trapping of male adult of pink bollworm at the time of August month/initiation of flowering	97	48.5	X
	(iii) Use of light trap	122	61	V

Sr. No.	Areas of Information	Frequency	Percentage	Rank
	(3) Biological measures			
	(i) Release of *trichogramma* @ 1.5 lacs/ha five times at weekly interval	34	17.0	XXIV
	(ii) Release of *crysoperla* larvae @ 10000/ha two times at weekly interval when 8 to 9 male moth catch/trap	68	34.0	XIX
	(iii) Spraying of *Beauveria bassiana* @ 60-80 g/10 lit. of water at the time of egg laying of pink bollworm	131	65.5	III
	(4) Chemical measures			
	(i) Spraying of quinalphos 25 EC 20 ml/10 lit of water OR	42	21.0	XXII
	(ii) Spraying of profenophos 50 EC 10 ml/10 lit of water OR	66	33.0	XX
	(iii) Spraying of thiodicarb 75 WP 10 gm/10 lit of water OR	90	45.0	XII
	(iv) Spraying of carbaryl 50 WP 40 gm/10 lit of water OR	46	23.0	XXI
	(v) Spraying of fenvalrate 20 EC 10 ml/10 lit of water OR	82	41.0	XV
	(vi) Spraying of deltamethrin 1 EC + trizophos 35 EC 20 ml/10 lit of water OR	100	50.0	IX
	(vii) Spraying of beta cyfluthrin 2.5 SC 10 ml/10 lit of water OR	80	40.0	XVI
	(viii) Spraying of spinosad 45 SC 3 ml/10 lit of water OR	124	62.0	IV
	(ix) Spraying of chlorantraniliprole 20 SC 3 ml/10 lit of water	86	43.0	XIII

The respondents were scheduled interviewed and asked to opine their views about the management of pink boll worm in cotton. The area of information were on the management, identification, life cycle of pink boll worm. The date presented in table 5 concluded that Cultural management practice with grazing sheep and goat after harvest the crops were stand first rank (72.5%) as knowledge of the farmers. It was followed by Cotton stalk should be burned after picking (68%) Rank-II, Spraying of Beauveria bassiana @ 60-80 g/10 lit. of water at the time of egg laying of pink bollworm(65.5%)Rank-III, Spraying of spinosad 45 SC 3 ml/10 lit of water OR (62%) Rank-IV, Use of light trap (61%) Rank-V, Collection of infested flowers, bolls and destroyed it (59.5%) Rank-VI, Use of pheromone trap @ 5/ha for monitoring of pink bollworm (54.5%) Rank-VII, Removal of weeds/Wild okra weed (53.5%) Rank-VIII, Spraying of deltamethrin 1 EC + trizophos 35 EC 20 ml/10 lit of water OR (50%) Rank-IX, Use of pheromone trap @ 40 /ha for mass trapping of male adult of pink bollworm at the time of August month/initiation of flowering (48.5%) Rank-X, Selection of early mature variety/Short duration variety (45%) Rank-XI, Spraying of thiodicarb 75 WP 10 gm/10 lit of water OR (45%) Rank-XII, Spraying of chlorantraniliprole 20 SC 3 ml/10 lit of water (43%) Rank-XIII, Using refugee crop (42%) Rank-XIV, Spraying of fenvalrate20 EC 10 ml/10 lit of water OR (41%) Rank-XV, Spraying of beta cyfluthrin 2.5 SC 10 ml/10 lit of water OR (40%) Rank-XVI, Using drip irrigation system (38%) Rank-XVII, Timely sowing (36%) Rank-XVIII, Release of crysoperla larvae @ 10000/ha two times at weekly interval when 8 to 9 male moth catch/trap (34%) Rank-XIX, Spraying of profenophos50 EC 10 ml/10 lit of water OR (33%) Rank-XX, Spraying of carbaryl 50 WP 40 gm/10 lit of water OR (23%) Rank-XXI, Spraying of quinalphos 25 EC 20 ml/10 lit of water OR(21%)Rank-XXII, Release of trichogramma @ 1.5 lacs/ha five times at weekly interval (17%) Rank-XXIV, Identification of Pink Bollworm (19.5%) Rank-XXIII, Avoiding ratooning of crop (15.5%) Rank-XXV, Nature of damage of Pink Bollworm (10.5%) Rank-XXVI, Following dense cropping system (10%) Rank-XXVII, Life cycle of Pink Bollworm (8.5%) Rank-XXVIII, and Deep ploughing (6%) Rank-XXIX. This findgs are also supported by Ochou (1990), Patel (2002), Biradar *et al.* (2013), Yadav *et al* (2017), Katke (2011) and Himadri *et al* (2018).

Constraints faced by cotton growers for pink boll worm

The respondents were asked to show the problem or constraints for management of pink boll worm in cotton cultivation. On the basis of frequency and percentage were ranked and asigne as for interpretation.

Table 5 : Constraints faced by cotton growers (n=200)

Sr. No.	Constraints	Frequency	Percentage	Rank
A	**Technical**			
1	Lack of information regarding pink bollworm identification	39	19.5	XIV
2	Lack of crop specific scientific recommendations	113	56.5	IX
3	Heavy attack of pink bollworm	173	86.5	III
4	Difficult to control of pink bollworm	121	60.5	VIII
B	**Institutional**			
1	No Govt. subsidies for control of pink bollworm	124	62.0	VI
2	Lack of awareness	54	27.0	XIII
3	Lack of technical guidance	86	43.0	XI
4	Less exposure of training	82	41.0	XII
C	**Economic**			
1	Require high investment to control of pink bollworm	156	78.0	IV
2	High labour requirement	142	71.0	V
3	High cost of pesticide	192	96.0	I
D	**Situational**			
1	Small holding	122	61.0	VII
2	Fragmented holding	181	90.5	II
3	Inadequate transport facility	90	45.0	X

The respondents mentioned some problem in management of pink boll worm in cotton cultivation. The problems suggested by majority of cotton farmers were : High cost of pesticide 96per cent (Rank-I), Fragmented holding 90.5 per cent (Rank-II), Heavy attack of pink bollworm 86.5 per cent (Rank-III), Require high investment to control of pink bollworm 78 per cent (Rank-IV), High labour requirement 71 per cent (Rank-V), No Govt. subsidies for control of pink bollworm 62 per cent (Rank-VI), Small holding 61 per cent (Rank-VII), Difficult to control of pink bollworm 60.5 per cent (Rank-VIII), Lack of crop specific scientific recommendations 56.5 per cent (Rank-IX), Inadequate transport facility 45 per cent (Rank-X), Lack of technical guidance 43 per cent (Rank-XI), Less exposure of training 41 per cent (Rank-XII), Lack of awareness 27 per cent (Rank-XIII) and Lack of information regarding pink bollworm identification 19.5 per cent (Rank-XIV). Similar results also supported by Bhati *et al* (2010) and Dilts, R. (1990).

Suggestions from cotton growers to overcome the constraints faced by them in adoption of better integrated management of pink bollworm

The respondents were asked to give suggestion to overcome the constraints and minimize the problem of pink boll worm in cotton cultivation.

Table 6 : Suggestions from cotton growers to overcome the constraints faced by them (n=200)

Sr. No.	Suggestions	Frequency	Percentage	Rank
1	Grow short duration and pink boll worm resistant variety	80	40.0	XI
2	Require crop rotation with non-host crop	27	13.5	XV
3	Use of bio-logical control measure for pink bollworm management	98	49.0	VI
4	Use mass media and mass campaign for awareness at proper indication and time bound service provide	116	58.0	V
5	Avoid ratoon cropping	58	29.0	XIV
6	Recycling of plant stalks with the help of waste decomposers	86	43.0	IX
7	Avoid direct rotavator for recycling of cotton stalk	68	34.0	XII

Sr. No.	Suggestions	Frequency	Percentage	Rank
8	Required genetic resistant variety for the pink bollworm	164	82.0	I
9	Refuge (20% non Bt seeds) should be planted along with Bt cotton, if provided in separate packet.	26	13.0	XVI
10	Install pheromone 5 /ha and light trap 5/ha	124	62.0	II
11	Use off mating disruption paste (MDP) Technology for reduce pest incidance	60	30.0	XIII
12	Inspect the crop at squaring and flowering stage for presence of PBW larvae within flowers.	119	59.5	IV
13	Chemical control measures should be initiated when pink bollworm crossed Economic Threshold Level (ETL)	82	41.0	X
14	Destroy residual stalks and partially opened bolls	93	46.5	VIII
15	Collect and destroy fallen squares, flowers and bolls in the field	95	47.5	VII
16	Install light traps and pheromone traps near ginneries, market yards for mass trapping of adults.	120	60.0	III

For the management of pink boll worm different suggestion were given by different faremrs and it were ranked as per :-Required genetic resistant variety for the pink bollworm 82per cent (Rank-I), Install pheromone 5 /ha and light trap 5/ha 62per cent (Rank-II), Install light traps and pheromone traps near ginneries, market yards for mass trapping of adults. 60per cent (Rank-III), Inspect the crop at squaring and flowering stage for presence of PBW larvae within flowers. 59.5per cent (Rank-IV), Use mass media and mass campaign for awareness at proper indication and time bound service provide 58per cent (Rank-V), Use of bio-logical control measure for pink bollworm management 49per cent (Rank-VI), Collect and destroy fallen squares, flowers and bolls in the field 47.5per cent (Rank-VII), Destroy residual stalks and partially opened bolls 46.5per cent (Rank-VIII), Recycling of plant stalks with the help of waste decomposers 43per cent (Rank-IX), Chemical control measures should be initiated when pink bollworm crossed Economic Threshold Level (ETL) 41per cent (Rank-X), Grow short duration and pink boll worm resistant variety 40per cent (Rank-XI), Avoid direct rotavator for recycling of cotton stalk 34per cent (Rank-XII), Use off mating disruption paste (MDP) Technology for reduce pest incidence 30per cent (Rank-XIII), Avoid ratoon cropping 29per cent (Rank-XIV), Require crop rotation with non-host crop 13.5per cent (Rank-XVI), Refuge (20% non Bt seeds) should be planted along with Bt cotton, if provided in separate packet. 13per cent (Rank-XVI). Similar results also supported by Bhati *et al* (2010) and Dilts, R. (1990), Rathwa *et al*. (2021 & 2022) and Patel *et al*. (2022).

CONCLUSION

It can be concluded that the cotton growers were medium in extension as well as social participation. They usage Krishi Vigyan Kendra as a knowledge hub for the source of information as well as mass media exposure. The knowledge level of farmers were very poor in identification of pink boll worm and its life cycle. For the management of pink bollworm sheep and goat grazing after harvest were most important according to the farmers knowledge. They also know different cultural, mechanical, biological and chemical measures for the management of pink boll worm in cotton.

Heavy attack of pink boll worm, small holding and high cost of pesticides were major constraints of the cotton growers. To overcome the constraints faced by farmers were development of genetic variety, use of pheromone and light trap in mass at farmers field as well as ginneries, market yards for mass trapping of adults of pink boll worm.

IMPLICATION

Government should banned ratoon crop, early sowing of cotton. Every people should aware about use of light trap by TV programmes and advertisements. Support to farmers for growing cotton.

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CONFLICT OF INTEREST

There is no conflict between author.

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