

KNOWLEDGE ABOUT FALL ARMY WORM AMONG MAIZE GROWERS

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ABSTRACT

Maize (Zea mays L) is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. In India, maize is the third most important food crops after rice and wheat. Area under maize crop in India is 7.7 million ha and production is 19.5 million ton in kharif 2017-18 which covers 80% area, contributes nearly 9 % in the national food basket. The study was carried out in Sabarkantha and Aravali District of Gujarat state. Two taluka of Sabarkantha District viz;Khedbrahma and Vadali and Two taluka of Aravali District viz;Bhiloda and Megharaj were randomly selected for the present study. Five villages from each taluka were selected randomly further from each village eight maize growers were selected randomly. Thus, total 160 maize growers were selected for the present study. Multi stage random sampling technique was used for the present study. The results of the study indicated that more than half of the maize growers were having medium level of knowledge about fall army worm. Majority of the maize growers possess knowledge about damage of the fall army worm while they do not possess knowledge regarding identification, life cycle, chemical, cultural, mechanical and biological control of fall army worm. Whereas, main important constraints perceived by the maize growers to control fall army worm were; lack of knowledge about lifecycle, insufficient knowledge about IPM practices and difficult to control insect.

Keywords: knowledge, fall army worm, maize growers

INTRODUCTION

Maize (*Zea mays L*) is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. Globally, maize is known as queen of cereals because it has the highest genetic yield potential among the cereals. In India, maize is the third most important food crops after rice and wheat. Area under maize crop in India is 7.7 million ha and production is 19.5 million ton in kharif 2017-18 which covers 80% area, contributes nearly 9 % in the national food basket. The area, production and productivity in Gujarat in the year 2017-18 was 3.02 lakhs ha, 4.69 lakhs MT and 1550.75 kg/ha, respectively (Anonymous, 2018). In addition to staple food for human being and quality feed for animals, maize serves as a basic raw material as an ingredient to thousands of industrial products that includes starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceutical, cosmetic, film, textile, gum, package and paper industries etc.

Maize production is effected by the many factors; among these pests is also play important role in decreasing the yield. Recently, maize crop was affected through fall army worm in Sabarkantha and Aravalli District and major loss occurred in the crop. Therefore, Awareness about the fall army worm among farmers is essential to ascertain as it is a

new pest in the crop. Hence, to study the knowledge about fall army worm among maize growers was undertaken.

OBJECTIVES

- (1) To know the attributes of maize growers
- (2) To measure the knowledge level of fall army worm among maize growers.
- (3) To identify constraints perceived by the maize growers to control of fall army worm

METHODOLOGY

The study was carried out in Sabarkantha and Aravali District of Gujarat state. Two taluka of Sabarkantha District viz;Khedbrahma and Vadali and Two taluka of Aravali District viz;Bhiloda and Megharaj were randomly selected for the present study. Five villages from each taluka were selected randomly further from each village eight maize growers were selected randomly. Thus, total 160 maize growers were selected for the present study. Multi stage random sampling technique was used for the present study.

To measure the knowledge level of fall army worm among maize growers teacher made test was developed with help of Department of Entomology, C.P.C.A, SDAU,

Sardarkrushinagar and consultation with Maize Research Station, Bhiloda. Total 28 statements of knowledge about fall army worm among maize growers were finalized for measurement. The responses of maize growers were obtained against each item with yes (1) and no (0) answer. Data was collected through use of structured interview schedule and descriptive statistics (Frequency, Percent, Mean and Standard Deviation) were used for tabulating and interpreting the data.

RESULTS AND DISCUSSION

Attributes of maize growers

Keeping in the view the objectives of study, the relevant variables were selected on the basis of an extensive review of literature related to the study, in consultation with experts and members of advisory committee. Only those variables which are found most relevant to the present investigation were finally selected. The results of the same are presented in Table.1

Table 1 : Selected attributes of maize growers

(n=160)

Sr. No.	Selected attributes of maize growers		Frequency	Percent
1	Age	Young age (up to 35 years)	19	11.87
		Middle age (36 to 50 years)	95	59.38
		Old age (above 50 years)	46	28.75
2	Education	Illiterate	12	07.50
		Functionally literate	15	09.37
		Primary school (1 st to 8 th std)	30	18.76
		Middle school (9 th to 10 th std)	44	27.50
		High school (11 th to 12 th std)	28	17.50
		Under-Graduate and Post-Graduate (UG/PG)	31	19.37
3	Land holding	Marginal (upto 1.00 ha.)	11	06.87
		Small (1.01 to 2.00 ha.)	30	18.75
		Medium (2.01 to 4.00 ha.)	71	44.38
		Big (above 4.01 ha)	48	30.00
4	Maize crop Area	Marginal (upto 1.00 ha.)	118	73.75
		Small (1.01 to 2.00 ha.)	23	14.38
		Medium (2.01 to 4.00 ha.)	16	10.00
		Large (above 4.01 ha)	03	01.87
5	Size of family	Small size (Up to 4 members)	42	26.25
		Medium size (5 to 8 members)	107	66.88
		Big size (More than 8 members)	11	06.87
6	Occupation	Farming alone	10	06.25
		Farming and Animal Husbandry	118	73.75
		Farming, Animal Husbandry and Business	20	12.50
		Farming, Animal Husbandry and Service	12	07.50
7	Annual income	Up to ₹ 2.00 lakh	24	15.00
		₹ 2.01 to ₹4.00 lakh	60	37.50
		₹ 4.01 lakh to ₹ 6.00 lakh	28	17.50
		₹ 6.01 lakh to ₹ 8.00 lakh	32	20.00
		More than ₹ 8.00 lakh	16	10.00
8	Social participation	No participation	92	57.50
		Membership in one organization	46	28.75
		Membership in more than one organization	13	08.13
		Membership with office bearer	09	05.62
9	Extension participation	Low participation (below 22.35 score)	25	15.62
		Medium participation (between 22.35 to 41.59 score)	103	64.38
		High participation (above 41.59 score)	32	20.00
		Mean=31.97	S.D=9.62	

Sr. No.	Selected attributes of maize growers		Frequency	Percent
10	Training received	Private institute (pesticide, seed, fertilizer company)	15	09.38
		Research station / SDAU	18	11.25
		Krushi Vigyan Kendra (KVK)	47	29.38
		Agriculture department	23	14.38
		Non-Government Organizations (NGOs)	14	08.75
		Co-operative institute	12	07.50
11	Cropping pattern	Maize -wheat-fallow	86	53.75
		Maize- potato-fallow	49	30.62
		Maize-wheat-Groundnut	28	17.50
		Maize-wheat-vegetable	22	13.75
		Maize-potato-groundnut	21	13.12
		Soyabean-maize-fallow	20	12.50
		Maize-potato-vegetable	19	11.87
		Cotton-maize-vegetable	16	10.00
Cotton-maize-fallow	13	08.12		

The data presented in Table.1 indicates that nearly three fifth (59.38 per cent) of the maize growers were belongs to middle age group, had above high school level of education (64.37 per cent), had medium to big size of land holding (74.38 per cent), were growing maize in marginal size of land (73.75 per cent), had medium size of family (66.88 per cent), having Farming and animal husbandry as a main occupation (73.75 per cent), had annual income below Rs. 6.00 lakhs (70.00 per cent), had no participation in any organization (57.50 per cent), had medium level of extension participation (64.38 per cent), were received training from krushi vigyan kendra, agriculture department and research station (55.01 per cent) and followed by maize-wheat-fallow (53.75 per cent) and maize-potato-fallow cropping pattern (30.62 per cent).

Knowledge level of fall army worm among maize growers

Knowledge is the cognitive behaviour of an individual. Knowledge plays an important role in covert as well as overt behavior of an individual. The data in this regards are presented in Table 2.

Table.2 : Distribution of respondents according to their level of knowledge about fall army worm (n=160)

Sr. No.	Categories	Frequency	Per cent
1	Low level of knowledge (up to 09.09 score)	47	29.38
2	Medium level of knowledge (09.10 to 23.27 score)	86	53.75
3	High level of knowledge (above 23.27 score)	27	16.87

Mean=16.18

S.D=07.09

The data presented in Table 2 shows that more than half (53.75 per cent) of the maize growers were having medium level of knowledge about fall army worm followed by 29.38 per cent and 16.87 per cent of maize growers had low and high level of knowledge about fall army worm, respectively.

Thus, it can be concluded that great majority (83.13 per cent) of the maize growers had medium to low level of knowledge about fall army worm. The findings are supported by the findings of Prajapati *et al.* (2015), Niak and Deshmukh (2016) and Rathod *et al.* (2020).

Table 3 : Practice wise knowledge level of maize growers about fall army worm (n=160)

Sr. No.	Practices	Total knowledge score	Obtained knowledge score	Per cent
1	Damage of fall army worm	320	296	92.50
2	Cultural control	640	388	60.62
3	Chemical control	800	420	52.50
4	Mechanical control	640	264	41.25
5	Identification of fall army worm	800	242	30.25
6	Life cycle of fall army worm	640	168	26.25
7	Biological control	640	158	24.68

It is evident from the data presented in Table 3 that great majority (92.50 per cent) of the maize growers had knowledge regarding damage of fall army worm followed by 60.62 per cent and 52.50 per cent maize growers had knowledge about cultural and chemical control of fall army worm, respectively. Whereas, knowledge of maize growers

about mechanical control, identification, life cycle and biological control of fall army worm was 41.25 per cent, 30.25 per cent, 26.25 per cent and 24.68 per cent, respectively.

It can be concluded that vast majority of the maize growers possessed knowledge about damage of fall army worm followed by cultural and chemical control of fall army worm while majority of the maize growers do not possess knowledge regarding mechanical control, identification, life cycle and biological control of fall army worm.

Table 4 : Knowledge level of General information regarding fall army worm (n=160)

Sr. No.	General information	Frequency	Per cent
1	Local name	118	73.75
2	Total numbers of stage	62	38.75
3	Name of stage	52	32.50
4	Damaging stage (larvae)	152	95.00

The data presented in Table 4 shows that in case of general information vast majority (95.00 per cent) of maize growers had knowledge about damaging stage of fall army worm followed by nearly three fourth (73.75 per cent) of the maize growers had knowledge of its local name. While 38.75 per cent maize growers having knowledge about number of stages of fall army worm. Whereas, 32.50 per cent maize growers had knowledge regarding name of different stages of fall army worm.

Table 5 : Knowledge level of life cycle and damage regarding fall army worm (n=160)

Sr. No.	Life cycle and damage	Frequency	Per cent
1	Place of eggs placement	38	23.75
2	Colour of eggs	29	18.12
3	Period of egg stage (days)	08	05.00
4	Colour of larvae	107	66.87
5	Period of larvae stage	78	48.75
6	Damage of larvae	152	95.00
7	Period of pupa stage	21	13.12
8	Colour of Adult	61	38.12
9	Period of adult stage	15	09.37

It is evident from the data presented in Table 5 regarding knowledge of life cycle and damage of fall army worm indicates that vast majority (95.00 per cent) of the maize growers had knowledge about damage of larvae

followed by larvae colour (66.87 per cent) and period of larvae stage (48.75 per cent). Whereas, 38.12 per cent, 23.75 per cent and 18.12 per cent maize growers had knowledge about adult colour, place of eggs and eggs colour regarding fall army worm, respectively. While only 13.12 per cent, 9.37 per cent and 5.00 per cent maize growers having knowledge about period of pupa stage, period of adult stage and period of egg stages of fall army worm, respectively.

Table 6 : Knowledge level of cultural control of fall army worm (n=160)

Sr. No.	Cultural practices	Frequency	Per cent
1	Ploughing	132	82.50
2	Crop rotation	108	67.50
3	Inter cropping	77	48.12
4	Use of irrigation and fertilizer as per recommendation	63	39.37

The data presented in Table 6 regarding knowledge of cultural control of fall army worm shows that great majority (82.50 per cent) of maize growers had knowledge of ploughing followed by 67.50 per cent of the maize growers had knowledge of crop rotation. While 50.62 per cent maize growers having knowledge about intercropping. Whereas, 39.37 per cent maize growers had knowledge regarding Use of irrigation and fertilizer as per recommendation.

Table 7 : Knowledge level of mechanical control of fall army worm (n=160)

Sr. No.	Mechanical control	Frequency	Per cent
1	Light trap	52	32.50
2	Pheromones trap	73	45.62
3	Bird scraper	25	15.62
4	Hand picking of eggs and larvae	47	29.37

It is evident from the data presented in Table 7 regarding knowledge of mechanical control of fall army worm indicates that 45.62 per cent had knowledge regarding use of pheromones trap followed by light trap (32.50 per cent) and hand picking of eggs and larvae (29.37 per cent). Whereas, 15.62 per cent maize growers had knowledge about bird scraper to control fall army worm.

Table 8 : Knowledge level of biological control of fall army worm (n=160)

Sr. No.	Biological control	Frequency	Per cent
1	Use of neem cake	68	42.50
2	Use of neem base insecticide	29	18.12
3	<i>Bacillus Thurengensis</i> (B.T)	31	19.38
4	<i>Buveria Besiana</i>	35	21.87

The data presented in Table 8 shows that 42.50 per cent maize growers having knowledge of neem cake followed by *Buveria besiana* (21.87 per cent) and *Bacillus thurengensis* (19.38 per cent). While 18.12 per cent maize growers had knowledge of neem based insecticide for control of fall army worm.

Table 9 : Knowledge level of chemical control of fall army worm (n=160)

Sr. No.	Chemical control	Frequency	Per cent
1	Use and preparation of poison bait	05	03.12
2	Application of chlorpyrifos	95	59.37
3	Application of chlorantraniliprol	57	35.62
4	Application of amamaktin benzoate	128	80.00
5	Application of spinosad	46	28.75

The data presented in Table 9 regarding knowledge about chemical control of fall army worm reveals that four fifth (80.00 per cent) of the maize growers had knowledge of application of amamaktin benzoate for fall army worm control followed by application of chlorpyrifos (59.37 per cent), chlorantraniliprol (35.62 per cent) and spinosad (28.75 per cent) to control fall army worm. Only 3.12 per cent maize growers had knowledge regarding use of poison bait to fall army worm control.

It is apparent from Table 10 that main important constraints perceived by the maize growers to control fall army worm were; lack of knowledge about lifecycle (88.75 per cent), insufficient knowledge about IPM practices (85.62 per cent), difficult to control (84.37 per cent) and poor knowledge about recommended dose of insecticide (80.00 per cent) were ranked first, second, third and fourth, respectively. Whereas, other constraints perceived by the maize growers were; high price of insecticide (63.75 per cent), lack of timely technical guidance (55.00 per cent) and Unavailability of labour in time (52.50 per cent) were ranked fifth, sixth and

seventh, respectively.

The findings are in agreement with those reported by Damor (2016).

Table 10 : Constraints perceived by the maize growers to control fall army worm (n=160)

Sr. No.	Constraints	Frequency	Per cent	Rank
1	Lack of knowledge about lifecycle	142	88.75	I
2	Insufficient knowledge about IPM practices	137	85.62	III
3	Difficult to control	135	84.37	II
4	Poor knowledge about recommended dose of insecticide	128	80.00	IV
5	High price of insecticide	102	63.75	V
6	Lack of timely technical guidance	88	55.00	VI
7	Unavailability of labour in time	84	52.50	VII

CONCLUSION

Nearly three fifth of maize growers belonged to middle age group, had educated middle school and above, possessed more than 2.00 ha. land, had area under maize crop up to 1.00 ha land, having medium size of family i.e; 5 to 8 members, engaged in farming and animal husbandry occupation, having annual income from Rs. 2.01 lakh to 8.00 lakh, had no member in any organization, had medium to high level of participation in extension activities, had received training from the Krushi Vigyan Kendra and had followed maize-wheat-fallow cropping pattern.

More than half of the maize growers were having medium level of knowledge about fall army worm. while practice wise knowledge vast majority of the maize growers had knowledge regarding damage of fall army worm followed by knowledge of cultural and chemical control of fall army worm.

Knowledge level of fall army worm among the maize growers with regards to practices were; having knowledge about damage stage of fall army worm, possessed knowledge about damage of larvae, had knowledge of ploughing and crop rotation and possessed knowledge about application of amamaktin benzoate and chlorpyrifos to fall army worm control. Whereas, majority of the maize growers do not possessed knowledge regarding identification, life cycle,

mechanical control and biological control of fall army worm.

Main important constraints perceived by the maize growers to control fall army worm were; lack of knowledge about lifecycle, insufficient knowledge about IPM practices, difficult to control insect and poor knowledge about recommended dose of insecticide.

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