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## Survey of insect pests of summer pearl millet in Gujarat

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### Introduction:

Pearl millet is a major cereal crop in northwestern India. The crop is grown in very harsh, arid, dry climatic areas having high temperature and low and erratic rainfall. Its use as food is declining but its use as cattle feed, poultry feed and source of starch in the alcohol industry is increasing. Its fodder is an important source of animal feed particularly in dry months when alternative sources of feed are not available. In the last decade, pearl millet was also grown under irrigation in the summer months. Gujarat state has the highest area under summer pearl millet not only among the northwestern states but also at the all-India level. Yields of summer pearl millet are much higher since it is grown under irrigation and its grain quality is also superior.

It is generally believed that pearl millet, either grown as mono crop or mixed crop or in relay cropping system has hardly had any serious problems. However, perusal of literature on insect pest of this crop gives quite a different picture. Twenty six insects and two non-insect pests were found feeding on pearl millet (Balikai, 2010). Out of these, shoot fly, *Atherigona varia socata*, stem borer, *Chilo*

*partellus* Swinhoe and ear head worm, *Helicoverpa armigera* are comparatively more serious pests attacking the crop. Now a day's fall army worm (*Spodoptera frugiperda*) is also emerging as a new pest in pearl millet (Patange *et al.*, 2021) in Aurangabad and Jalna districts of Maharashtra in *kharif* pearl millet. The literature on insect-pest incidence in *kharif* pearl millet is available. However, no study of pest situation in summer pearl millet is available. Sometimes minor pest becomes major pest. Hence, the study was under taken during summer 2021.

### Material and methods

The study/survey was conducted in pearl millet at farmer's fields (72 field visits and 8 virtual (video calling), total 80 fields) during summer 2021. It was carried out in 7 districts/blocks viz., Jamnagar, Junagadh, Rajkot, Surendranagar, Kheda, Anand and Banaskantha covering 21 tehsils by the team of scientists consisting of entomologist of Pearl Millet Research Station, Junagadh Agricultural University, Jamnagar, all in Gujarat, India. The survey was conducted at vegetative as well as at ear head stage. The date of survey, name of village, name of tehsil,

name of district/block was noted. The area and variety of pearl millet sown by the farmer was also recorded. Incidence of insect-pest was worked out from taking the observations of 20 plants. The population of insect pests infesting pearl millet crop was recorded from 5 randomly selected plants or ear heads per field. For shoot fly, stem borer & fall army worm, per cent damage was worked out. Whereas, for *Helicoverpa armigera* the larval counts were taken into consideration per five ear heads. The grey weevil damage score was done by scaling 0 to 10.

## Results and discussion

The details of incidence have been given in table-1.

**a. Shoot fly (*Atherigona approximata*, Malloch):** The shoot fly per cent incidence ranged from 0.0 to 10.00% with an average of 1.93%. The highest incidence was recorded at Aya (Tehsil- Sayla, District-Surendranagar) in pearl millet variety Pioneer at ear head stage.

**b. Stem borer (*Chilo partellus*, Swinhoe):** The stem borer per cent incidence ranged from 0.0 to 10.00% with an average of 0.73%. The highest incidence was recorded at Moti banuagar (Tehsil & District Jamnagar) in pearl millet variety Akshay kranti at ear head stage.

**c. *Helicoverpa armigera*:** The larval population ranged from 0.0 to 5.0 larvae/ 5

ear heads with an average of 0.70 larvae/5 ear heads at ear head stage. The highest larval population was recorded at Mahelav (Tehsil & District-Anand) in pearl millet variety Manglam 252 and at Jhakhhar (Tehsil- Lalpur, District-Jamnagar) in pearl millet variety Rasi 502 at ear head stage.

**d. Fall army worm (*Spodoptera frugiperda*):**

The FAW damage incidence ranged from 0.0 to 20.00% with an average of 2.28%. The highest incidence (20.00%) was observed at Sunav (Tehsil-Petlad, District-Anand) in variety MP 7333.

**e. Grey weevil [*Mylocherus subfasciatus* (Guerin-Meneville)]:** The grey weevil damage score ranged from 0.0 to 5.0 with an average of 0.84. The highest damage (5.0 Damage score) was observed at Sandesar (Tehsil & District-Anand) in variety Avani 444.

The overall incidence of various insect-pests was low to moderate. Shoot fly incidence was observed in all the districts and it was highest in Jamnagar district (2.17%) with an average of 1.93%. Stem borer incidence was also observed in all the districts and it was again highest in Jamnagar district. The number of *Helicoverpa armigera* larvae per 5 ear heads was higher in Jamnagar & Junagadh district. During summer 2021, fall army worm was observed at farmer's fields in Anand (5.21%), Junagadh (7.50%) and Kheda (2.08%) districts. The overall average incidence of fall

army worm was 2.28%. Grey weevil damage was observed high in Jamnagar district (1.44).

### Conclusions

From the above study done on survey of major insect-pests in pearl millet during summer 2021 it was found that there was huge difference in the intensity of different insect pests at different locations. In summer pearl millet, apart from shoot fly, stem borer and *Helicoverpa armigera*, fall army worm and grey weevil damage were observed. Hence, it is important to monitor these pests from time to time in summer season.

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**Table-1: Showing the details of District-wise/Block-wise insect-pest situation at farmers fields (Summer pearl millet, 2021)**

Districts	GPS locations		No. of Tehsils	No. of fields surveyed	Shoot fly %	Stem borer %	<i>Helicoverpa</i> larvae /5 EH	FAW % damage	Grey weevil damage score
	Latitude	Longitude							
1. Anand	22.554029	72.948936	2	24	<u>2.17</u>	0.21	0.79	5.21	0.96
2. Banaskantha	24.415827	72.635379	1	1	1.00	1.00	0.00	0.00	0.00
3. Jamnagar	22.470701	70.057732	5	9	1.56	<u>2.22</u>	<u>1.00</u>	0.00	<u>1.44</u>
4. Junagadh	21.515471	70.456444	2	2	1.00	1.00	<u>1.00</u>	<u>7.50</u>	1.00
5. Kheda	22.750650	72.684669	3	12	1.67	0.25	0.83	2.08	0.17
6. Rajkot	22.308155	70.800705	2	5	1.40	1.80	0.60	0.00	1.40
7. Surendranagar	22.728392	71.637077	5	27	1.92	0.35	0.35	0.00	0.62
			<b>Overall Mean</b>		<b>1.93</b>	<b>0.73</b>	<b>0.70</b>	<b>2.28</b>	<b>0.84</b>

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