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## Occurrence of the fall armyworm, *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera, Noctuidae), a new pest on bajra and sorghum in the fields of agricultural research station, Ananthapuramu, Andhra Pradesh, India

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### Abstract

Occurrence of fall armyworm on bajra and sorghum was noticed during October, 2018. The damage was to the extent of 30 percent in bajra and 70 percent in sorghum in the fields of Agricultural Research Station, Ananthapuramu. The marks of identification of the larvae and damage symptoms in the leaf whorl are useful tools to identify the larvae of fall army worm. The pest is gradually spreading to other millets of Ananthapuramu district in Andhra Pradesh, India.

**Keywords:** Fall armyworm, *Spodoptera frugiperda*, marks of identification, damage, bajra, sorghum

### 1. Introduction

*Spodoptera frugiperda* (J.E. Smith) is a polyphagous pest indigenous throughout the America [1, 2] which has recently appeared in Africa [3] and Ghana [4]. The caterpillars of this moth feed on leaves, stems and reproductive parts of many plant species preferably Gramineae family including maize, millet, sorghum, sugarcane, rice, wheat etc. [5]. In Brazil fall army worm considered as the major insect pest for the maize [6] causing upto 34% reduction in the grain yield and annual losses of US \$ 400 million [7]. The notorious pest was recently entered in India in 2018 and caused damage to maize fields of Karnataka state [8]. Heavy damage was noticed in Bangalore rural and Chikkaballapur districts and were devastated by caterpillars during May and June, 2018 [9]. Its occurrence very severe in South Indian state Karnataka followed by Tamil Nadu and Andhra Pradesh states that are major regions for hybrid maize [9]. The migration of fall army worm from Chikkaballapur district to Ananthapuramu district of Andhra Pradesh was noticed in the month of August, 2018 and devastating of the maize fields was noticed between the age of 15- 60 days, respectively [10]. From July, 2018 onwards, this pest is being identified on maize crop in different parts of Andhra Pradesh and Telangana states. And it was also observed in Anantapuram district in maize crop during *kharif*, 2018 in Hindupur division. It was spread to other millet crops like bajra and sorghum in the district among which Anantapuram rural and ARS, Anantapuram. Hence, a study was conducted under late *kharif*, 2018 for studying the damage of fall army worm in bajra and sorghum at ARS, Anantapuram.

### 2. Materials and methods

Field trials were sown during late *kharif* 2018 on 28<sup>th</sup>, September, 2018 at Agricultural Research Station, Ananthapuramu with ABV 04 of Barja variety in an area of 352 m<sup>2</sup>. The crop was raised by following all agronomic practices formulated by ANGRAU, Lam, Guntur for growing bajra crop. Crop was supervised for pest and disease attack at regular intervals from germination. Similarly sorghum crop was sown during *kharif*, 2018 for the multiplication of seed material was regularly monitored for the incidence of insect pests.

The incidence of fall army worm was observed from one week after germination at a low level. The crop was supervised for the incidence of fall army worm under unprotected conditions. For this purpose, the plants in an area of one metre was observed for the incidence. Incidence was recorded in terms of damaged plants to the total number of plants in area of one m<sup>2</sup>.

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### 3. Results and discussion

The occurrence of the fall armyworm, *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae) was noticed for the first time on bajra and sorghum in Agricultural Research Station, Ananthapuramu and Rekulakunta village, Andhra Pradesh in the month of October, 2018. The fall armyworm damage was observed in bajra and sorghum crops in experimental plots of Agricultural Research Station, Ananthapuramu and farmer's field of Rekulakunta village, respectively [10]. The larval incidence and damage symptoms were recorded.

The incidence was observed from first week of October (40<sup>th</sup> standard week) in a sporadic manner, incidence was low during that week in both bajra (figure. e) and sorghum crops (figure. f). There was gradual increase in damage on both crops with the advance of larval instar. The damage was reached maximum during last week of October, 2018 (30 percent in bajra and 70 percent in sorghum).

**Table 1:** Damage caused by fall army worm in bajra and sorghum crops during 2018 at ARS, Ananthapuramu.

S. No	Standard week	Percent damage	
		Bajra	Sorghum
1	40 <sup>th</sup> (1-7, October, 2018)	3.50	15.5
2	41 <sup>st</sup> (8-14, October, 2018)	13.8	27.0
3	42 <sup>nd</sup> (15-21, October, 2018)	21.5	43.5
4	43 <sup>rd</sup> (22-28, October, 2018)	30.0	70.0

**Damage symptoms:** The early instar larvae showed pin hole symptoms on the leaves. Early instars scrape the chlorophyll which lead to white elongated patches. Later instars cause windows on leaves because of voracious feeding and faecal pellets in whorls (figure.a). Later larval instars caused the foliar damage by cutting down by leaves.

#### Marks of identification of the larvae and pupa

The mature larva is with a typical inverted 'Y' on head capsule and four dark spots on 2nd segment from posterior end of abdomen (four black spots arranged in a square on the last but one abdominal segment) (fig. b and fig. c). The pupa is reddish brown in colour and pupates in the soil [11]. They were compared with the original available identification keys specific to *Spodoptera* spp. for confirming the genus and species. All the larval characters resembled those of *S. frugiperda*. The above larval characters were compared with the taxonomic literature and the species was confirmed as *Spodoptera frugiperda* (J.E. Smith) and conclude that new pest *S. frugiperda* incidence was noticed on bajra and sorghum in the fields of Agricultural Research Station, Ananthapuramu, India and it is possible to spread other millets [12, 13].

### 4. Conclusion

The occurrence and incidence of fall army worm spreads from maize to bajra and sorghum to other millet crops in Ananthapuramu district, Andhra Pradesh, India because it attacks mainly maize, but it has the ability to survive on many graminaceous plants like millets (Sorghum, Bajra, finger millet etc.). The Fall Armyworm adults can fly long distance i.e. 100km per night and 2000km during its lifetime, Egg hatches in 2-3days, larva period is usually 14-28 days. (Summer 14 days, winter 28days) and female adults lay eggs in clusters of 50to 200 on young leaves or base of the tender plants. Larval stages (from 3<sup>rd</sup> instar to 6<sup>th</sup> instar larvae) cause severe damage on the crops where fall armyworm incidence

and damage was notice [11].

The marks of identification of the larvae and damage symptoms inside the leaf whorl are useful tools in identification of fall army worm at field level [8].

Fall armyworm incidence on bajra and sorghum at ARS, Ananthapuramu and Rekulakunta village



Larva causing damage in the whorls



4 distinct spots on last abdominal segment



Inverted white "Y" shaped suture on the head



Brown colour pupa



Damage of the bajra crop at ARS, Ananthapuramu



Damage of sorghum at Rekulakunta village

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