



## SEASONAL INCIDENCE OF *SPODOPTERA LITURA* (F) ON SOYBEAN

K RAJASHEKAR<sup>1\*</sup>, SREEDHAR CHAUHAN<sup>1</sup> AND K SANTHOSH<sup>1</sup>

<sup>1</sup>Agricultural Research Station, Ram Nagar, Adilabad 504002, Telangana, India

\*Email: kanjarlarajashekar@gmail.com (corresponding author): ORCID ID 0000-0002-1539-5688

### ABSTRACT

An investigation was carried out to “Study on seasonal incidence of *Spodoptera litura* (F.) on soybean” at Agriculture Research Station (ARS), Adilabad, Professor Jayashankar Telangana State Agricultural University during kharif, 2017 and 2018. The pooled results indicated that among different sowing dates viz., 15<sup>th</sup>-18<sup>th</sup> of June (sowing I), 25<sup>th</sup>-28<sup>th</sup> of June (sowing II), 5<sup>th</sup>-7<sup>th</sup> of July (sowing III), 15<sup>th</sup>-17<sup>th</sup> of July (sowing IV) and 25<sup>th</sup>-27<sup>th</sup> of July (sowing V) sowing I recorded minimum incidence (2.81 larvae/ meter row length) of *S. litura* population and maximum incidence in sowing II (4.34 larvae/ meter row length), similarly sowing I recorded minimum incidence (2.97 larvae/ meter row length) and maximum incidence in sowing II (4.34 larvae/ meter row length) during kharif, 2017 and 2018, respectively.

**Key words:** Seasonal incidence, *Spodoptera litura*, soybean, Kharif, sowing dates, minimum incidence, population.

In India, soybean is cultivated in an area of 113.98 lakh ha. during 2019-20 (SOPA., 2020). Nearly 48% of soybean cultivated area is contributed by Madhya Pradesh and is called as ‘Soya-state’. Previous researchers’ findings concluded that seed yield and seed quality are being adversely affected by major insect pests viz., girdle beetle, tobacco caterpillar, green semi looper, jassids and whitefly (Ahirwal et al., 2015). The infestation varied with date of sowing (Kalyan and Ameta, 2017). Understanding the fluctuations in weather parameters over a period of time and adjusting the management practices towards achieving better yields for improvement of social economic status. Hence the study was carried out to know the damage of various insect pests of soybean in relation to weather parameters.

### MATERIALS AND METHODS

The present experiment was carried out at Agriculture research station, Adilabad, during kharif, 2017 and 2018. Adilabad is situated in Northern zone of Telangana state (19° 40 12.00” N, 78° 31 48.00” E with an altitude of 264 m from Mean Sea Level (MSL). The experimental field represented medium black soil with good drainage and possessed low to medium organic matter as well as potash contents. The pH and soluble salts were normal. Fertilizers were applied at the time of sowing as basal dose of 30 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 40 kg K<sub>2</sub>O/ ha in the form of Urea, Diammonium phosphate and Murate of potash, respectively.

Soybean, variety JS 335 was sown in an area of 1250

m<sup>2</sup> with a plot size of 50 x 5 m. Five such sowings were taken up on different dates during kharif, 2017 viz., on 18.06.17, 28.06.17, 07.07.17, 17.07.17 and 27.07.17 and similar sowing were taken up during kharif, 2018 on 15.06.18, 25.06.18, 05.07.18, 15.07.18 and 25.07.18. Spacing of 45 x 5 cm was followed between rows and plants of soybean. The experiment was conducted under unprotected conditions. The data obtained were analysed and transformed to corresponding angular transformed values with one factor analysis with OPSTAT Statistical Software Package of Chaudhary Charan Singh Haryana Agricultural University, Hisar.

The observation on tobacco caterpillar (No. of larvae/ meter row length) was recorded once in a standard week at three locations of one meter row length (meter row length) from vegetative stage of the crop till harvesting stage of the crop.

### RESULTS AND DISCUSSION

The incidence of *S. litura* in soybean crop was observed in all the dates of sowing during kharif, 2017 where it started during 28<sup>th</sup> Standard Meteorological Week (1.10 larvae/ meter row length). The population increased gradually and reached peak during 36<sup>th</sup> SMW (4.30 larvae/ meter row length). Similarly, during sowing II, the incidence started from 29<sup>th</sup> SMW (0.40 larvae/ meter row length) with an overall larval population ranging from 0.40 to 7.80 larvae/ meter row length. Likewise in the sowings III, IV and V the larval population ranged between 1.82 to 6.24, 1.00 to

Table 1. Seasonal incidence of *S. litura* (F.) on soybean

Sowing I		Sowing II		Sowing III		Sowing IV		Sowing V	
SMW	Larva (No./ meter row length)	SMW	Larva (No./ meter row length)	SMW	Larva (No./ meter row length)	SMW	Larva (No./ meter row length)	SMW	Larva (No./ meter row length)
Kharif, 2017									
28	1.10	29	0.40	30	2.86	31	1.10	32	1.90
29	1.52	30	1.60	31	6.14	32	1.52	33	2.20
30	1.90	31	1.60	32	6.24	33	1.90	34	2.50
31	2.85	32	2.20	33	5.32	34	2.85	35	2.65
32	2.92	33	4.80	34	5.21	35	2.92	36	3.20
33	3.20	34	5.40	35	4.20	36	3.20	37	3.54
34	3.24	35	4.20	36	3.80	37	3.24	38	2.52
35	4.21	36	6.60	37	3.40	38	4.21	39	2.20
36	4.30	37	6.60	38	2.80	39	4.30	40	1.90
37	2.90	38	7.80	39	2.44	40	2.90	41	1.70
38	2.80	39	6.54	40	1.82	41	1.00	42	1.04
Mean	2.81	Mean	4.34	Mean	4.02	Mean	2.65	Mean	2.30
Kharif, 2018									
28	0.90	29	0.50	30	0.84	31	0.95	32	0.52
29	1.25	30	1.56	31	1.24	32	1.00	33	1.25
30	1.40	31	1.78	32	1.36	33	1.20	34	1.80
31	2.00	32	2.00	33	1.58	34	1.40	35	2.12
32	2.56	33	2.45	34	1.94	35	2.00	36	2.40
33	2.58	34	3.20	35	2.16	36	2.15	37	2.63
34	3.00	35	3.95	36	3.54	37	3.00	38	3.50
35	3.90	36	4.50	37	4.54	38	3.20	39	3.90
36	4.20	37	5.20	38	4.62	39	4.00	40	2.68
37	5.00	38	5.00	39	5.42	40	4.20	41	4.20
38	5.90	39	5.60	40	5.90	41	5.00	42	4.25
Mean	2.97	Mean	3.25	Mean	3.01	Mean	2.55	Mean	2.68
(Kharif 2017, 2018)									
Treatments	Larva (No./mrl)	Treatments	Larva (No./mrl)						
(Sowing I)	2.81	(Sowing I)	2.97						
18-06-17	(1.97)	15-06-18	(1.99)						
(Sowing II)	4.34	(Sowing II)	3.25						
28-06-17	(2.33)	25-06-18	(2.07)						
(Sowing III)	4.02	(Sowing III)	3.01						
07-07-17	(2.25)	05-07-18	(2.01)						
(Sowing IV)	2.65	(Sowing IV)	2.55						
17-07-17	(1.91)	15-07-18	(1.89)						
(Sowing V)	2.30	(Sowing V)	2.68						
27-07-17	(1.83)	25-07-18	(1.92)						
SE m±	0.007	SE m±	0.003						
CD at 5%**	0.02	CD at 5%**	0.008						
CV %	0.718	CV %	0.292						

mrl = meter row length; Figures in parenthesis angular transformed values

4.30 and 1.04 to 3.54 larvae/ meter row length with the highest larval population during 32<sup>nd</sup> SMW (6.24 larvae/ meter row length), 39<sup>th</sup> SMW (4.30 larvae/ meter row length) and 37<sup>th</sup> SMW (3.54 larvae/ meter row length), respectively (Table 1).

During kharif, 2018, the incidence of *S. litura* ranged between 0.90 to 5.90, 0.50 to 5.60, 0.84 to 5.90, 0.95 to 5.00 and 0.52 to 4.25 larvae/ meter row length with the highest population during 38<sup>th</sup> SMW (5.90 larvae/ meter row length), 39<sup>th</sup> SMW (5.60 larvae/ meter row length), 40<sup>th</sup> SMW (5.90 larvae/ meter row length), 41<sup>st</sup> SMW (5.00 larvae/ meter row length) and 42<sup>nd</sup> SMW (4.25 larvae/ meter row length) during sowings I, II, III, IV and V, respectively.

Among different dates of sowings, the incidence of *S. litura* population was low in sowing I (2.81 larvae/ meter row length) followed by gradual increase in II (4.34 larvae/ meter row length) and III (4.02 larvae/ meter row length) sowings which showed decrease in IV (2.65 larvae/ meter row length) and V (2.30 larvae/ meter row length) sowings. However, during kharif, 2018 the lowest incidence of *S. litura* population was recorded in sowing IV (2.55 larvae/ meter row length) followed by sowing V (2.68 larvae/ meter row length), sowing III (3.01 larvae/ meter row length) and sowing I (2.97 larvae/ meter row length), respectively, though maximum mean incidence of 3.25 larvae/meter row length was recorded in sowing II. From the above results it is concluded that minimum incidence of pest population was observed in sowing I.

The present findings are in partial agreement with the findings of Harish et al. (2008) who reported that maximum larval population of *S. litura* (7.80, 6.50, and 8.60 larvae/ meter row length, respectively) was noticed on the crop sown on 08-06-06, 27-06-06 and 08-07-06 dates, respectively revealing early sown crop recording lower incidence of *S. litura*. Basic information on the seasonal incidence of leaf eating caterpillars on soybean is considered as most essential to manage the pest in soybean. Mandal et al., (1998) observed *S. litura* being low in early sown (22<sup>nd</sup> June and 2<sup>nd</sup> July) soybean. Incidence of this pest was high in the crop when sown between 12<sup>th</sup> July and 1<sup>st</sup> August. Yeotikar et al., (2015) reported that the incidence of *S. litura* was observed during 32<sup>nd</sup> to 35<sup>th</sup> SMW. Babu et al., (2015) recorded the incidence from 30<sup>th</sup> SMW to 38<sup>th</sup> SMW, whereas, Matti and Deotale et al. (2017) reported incidence of

*S. litura* from 35<sup>th</sup> to 46<sup>th</sup> SMW. Babu et al., (2015) also found that, adult population of *S. litura* was active from August to mid-October which later decreased sharply in late October. The peak appearance was observed during September-October months and corresponded with peak activity of egg masses and larval population in soybean contributed to the outbreak of the pest during reproductive stage of the crop.

#### ACKNOWLEDGEMENTS

The authors thank the Principal scientist and Head, Agricultural research station Adilabad, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India for providing facilities.

#### FINANCIAL SUPPORT

Nil

#### AUTHOR CONTRIBUTION STATEMENT

K R S and S C framed idea and designed the study. S K collected the samples. K R S and S C wrote and edited the manuscript.

#### CONFLICT OF INTEREST

No conflict of interest.

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(Manuscript Received: December, 2022; Revised: May, 2023;

Accepted: May, 2023; Online Published: May, 2023)

Online First in www.entosocindia.org and indianentomology.org Ref. No. e23968