Andhra Pradesh J Agril. Sci : 10(3): 179-186, 2024

INFLUENCE OF WEATHER PARAMETERS ON THE INCIDENCE OF LEPIDOPTERAN PESTS ON GROUNDNUT

U. VENKATESWARLU*, M.S.V. CHALAM, N.C. VENKATESWARLU, K. VISWANATH, G. MOHAN NAIDU AND K.MANJULA

Department of Entomology, S.V. Agricultural College, ANGRAU, Tirupati-517 502.

Date of Receipt: 27-06-2024 Date of Acceptance: 06-12-2024

ABSTRACT

The study was carried out to know the impact of weather parameters on the occurrence of lepidopteran pests in groundnut during *kharif*, 2021 and *kharif*, 2022. The highest per cent foliar damage due to *Spodoptera litura* (Fabricius) (46.00 and 41.45) and *Helicoverpa armigera* (Hubner) (27.80 and 31.16) were recorded in sown D_4 crop (30th July), respectively. Correlation studies indicated that the maximum and minimum temperatures showed a negative impact on foliar damage by *H. armigera* and *S. litura* in groundnut crop sown from June first fortnight to July second fortnight (D_1, D_2, D_3 and D_4) and significant negative correlation with maximum temperature (-0.55 and -0.62) on *H. armigera* on groundnut sown in D_2 and D_4 crops, respectively. The significant negative correlation (-0.53 and - 0.55) on *S. litura* in D_2 and D_3 sown crops during *kharif*, 2021 and *kharif*, 2022, respectively. While the minimum temperature exhibited significant negative influence with *H. armigera* (– 0.60 and – 0.60) in D_3 and D_4 sown crops. However, minimum temperature exerted negative association (-0.64) on the influence of *S. litura* in D_3 sown crop in *kharif*, 2021. During *kharif*, 2022, the minimum temperature exerted significant negative correlation (D_1 = - 0.87, D_2 = - 0.65, D_3 = - 0.74 and D_4 = - 0.84) on the foliar damage by *H. armigera* in all dates of sowing crops. The minimum temperature showed significant negative correlation (- 0.84, - 0.66 and – 0.74) which was recorded in D_1, D_2 and D_3 sown crops. During *kharif*, 202, morning relative humidity exhibited a significant and positive association in D_2 (0.56), D_3 (0.64) and D_4 (0.77) sown groundnut and evening relative humidity exhibited significant positive association in D_3 (0.71) and D_4 (0.69) sown crops with respect to foliar damage due to *H. armigera*. For *S. litura* morning relative humidity exhibited a significant positive association in D_2 (0.56), D_3 (0.66) and D_4 (0.56) sown crops and evening relative humidity exhibited significant positive association in D_3 (0.79) and D_4 (0.57) sown crops.

KEYWORDS: *Spodoptera litura*, *Helicoverpa armigera*, dates of sowing, groundnut, *kharif*.

INTRODUCTION

Groundnut is a legume crop which has been cultivated in more than 100 countries in the world covering six continents. Groundnut is the sixth most important oilseed crop in the world contributing around 35.29 per cent of the total oil seeds production in the country during 2021-22 (Directorate of Economics and Statistics, 2022). More than 90 insect pests cause considerable yield reduction in groundnut and among them lepidopteran pests *viz*., leaf miner (*Aproaerema modicella* Deventer), tobacco caterpillar (*Spodoptera litura* (Fabricus), gram pod borer, *Helicoverpa armigera* (Hubner) and red hairy caterpillar (*Amsacta albistriga* Walker) are considered as major pests. Among the above, *S. litura* and *H. armigera* are the predominant defoliators attacking groundnut during vegetative crop growth period leading to poor yield (Radhika, 2013). Hence, studies are needed on seasonal incidence in relation to dates of sowing to forewarn about the damage due to *S. litura* and *H. armigera* for initiating initiate timely control measures.

MATERIAL AND METHODS

The experiment was carried out at Regional Agricultural Research Station, Tirupati during *kharif*, 2021 and *kharif*, 2022. The variety Kadiri-6 was sown in plot of 10 m × 10 m with row to row spacing of 30 cm and with plant to plant spacing of 10 cm. The crop was raised duly following normal agronomic practices developed by ANGRAU. The incidence of defoliators (*S. litura* and *H. armigera*) was recorded by taking counts on number of larvae per plant on 10 randomly selected plants (mean of 5 observations recorded as final data) and expressed as percentage. Weather data pertaining to maximum and minimum temperature, morning and evening relative humidity (%), sunshine (h) and rainfall (mm) was taken as per standard week from meteorological observatory and used in correlation studies, to know the influence of weather parameters and dates of sowing on the population dynamics of lepidopteran pests.

*Corresponding author, E-mail: uyyalavenkat5@gmail.com

RESULTS AND DISCUSSION

In first sown crop (15th June - D_1) the mean foliar damage due to the incidence of *H. armigera* and *S. litura* was observed from 28th SW (Standard Week) (1.07, 2.13, respectively) and increased during 29th SW (4.23, 8.46, respectively) and reached peak during 36th SW (16.62, 24.63, respectively) and gradually decreased at 37th SW (15.38, 23.96, respectively) (Table.1).

In second date of sowing (30th June-D_2) the foliar damage started during 31st SW (4.35 and 5.43) and increased during 32nd SW (5.07 and 7.32) and reached peak at 36th SW (20.35 and 28.02) and then decreased at 40th SW (12.18 and 15.86) for *H. armigera* and *S. litura*, respectively in *kharif*, 2021. While in *kharif*, 2022, the foliar damage started during 31st SW (2.80 and 4.76) and increased during 32nd SW (6.30 and 8.49) and reached peak at 37th SW (28.72 and 34.20) and then decreased at 39th SW (10.49 and 17.32) for *H. armigera* and *S. litura*, respectively (Table. 2).

In third date of sowing (15th July – D_3) the per cent mean foliage damage due to *H. armigera* and *S. litura* in *kharif*, 2021 started at 33rd SW (9.09, 16.72) and increased during 34th SW (19.46, 30.54) and reached peak at 35th SW (22.26, 31.96) and then decreased at 36th SW (16.67, 28.87). During *kharif*, 2022, the per cent mean foliage damage due to *H. armigera* and *S. litura* started at 33rd SW (7.32 and 9.01) and increased during 34th SW (11.48 and 18.73) and reached peak mean per cent foliar damage by *H. armigera* at 35th SW (28.77) and for *S. litura* at 36th SW (34.25) and then decreased at 37th SW (19.66 and 21.91) (Table. 3).

In fourth date of sowing (30th July - D_4) the mean foliar damage due to *H. armigera* and *S. litura* started at 35th SW (6.18 and 10.36) and increased during 36th SW (8.89 and 11.32,) and reached peak at 44th SW (36.40 and 39.50) in *kharif*, 2021. While in *kharif*, 2022, the mean foliar damage due to *H. armigera* and *S. litura* started at 35th SW (3.69 and 3.38), increased during 36th SW (4.53 and 5.83) and reached peak at 43rd SW for *H. armigera* (31.16) and for *S. litura* at 42nd SW (41.45) and then decreased at 44th SW (31.00 and 34.30) (Table 4).

CORRELATION ANALYSIS

During *kharif*, 2021correlation studies indicated that that maximum temperature in all the dates of sowing (D_1, D_2, D_3 and D_4) is negatively correlated with foliar damage by *H. armigera*. However, a significant negative correlation (-0.62) was recorded in D_4 sown crop. Similarly, minimum temperature also exerted negative influence on foliar damage by *H. armigera* in all dates of sowing, but the correlations were significant (D_3 = -0.60) and D_4 = - 0.60) in D_3 and D_4 sown crops.

Morning relative humidity exhibited a significant and positive association with foliar damage due to *H. armigera* in D_2 (0.56), D_3 (0.64) and D_4 (0.77) sown groundnut. Evening relative humidity also exhibited positive correlation with foliar damage due to *H. armigera* in all dates of sowing but significant positive

Table 1. Mean foliar damage due to lepidopteran insect pests on groundnut during *kharif*, 2021 and *kharif*, 2022 – First date of sowing (D_1) (15th June)

Standard week (SW)	Mean foliar damage (%)			
	Helicoverpa armigera		*Spodoptera litura*	
	2021	2022	2021	2022
28 SW (9-15 July)	1.07	1.99	2.13	2.66
29 SW (16-22 July)	4.23	2.33	8.46	5.52
30 SW (23-29, July)	9.36	5.17	11.04	7.18
31 SW (30 July-05August)	10.65	9.30	11.24	11.55
32 SW (06-12, August)	11.54	11.34	13.59	14.43
33 SW (13-19, August)	13.44	12.84	15.00	16.12
34 SW (20-26, August)	14.43	15.43	19.56	20.57
35 SW (27 August -02, September)	15.05	21.12	20.41	25.95
36 SW (03- 09, September)	16.62	23.28	24.63	29.17
37 SW (10-16, September)	15.38	23.11	23.96	28.95

Table 2. Mean foliar damage due to lepidopteran insect pests on groundnut during *kharif*, 2021 and *kharif*, 2022- Second dateof sowing (D_2) (30th June)

Standard week (SW)	Mean foliar damage (%)			
	Helicoverpa armigera		*Spodoptera litura*	
	2021	2022	2021	2022
31 SW (30 July – 05, August)	4.35	2.80	5.43	4.76
32 SW (06 – 12, August)	5.07	6.30	7.32	8.49
33 SW (13 - 19, August)	8.91	13.06	13.22	18.61
34 SW (20-26, August)	10.65	14.32	15.32	19.53
35 SW (27 August - 02, September)	18.95	18.52	27.70	22.22
36 SW (03-09, September)	20.35	27.22	28.02	33.24
37 SW (10-16, September)	17.57	28.72	24.09	34.20
38 SW (17-23, September)	14.75	22.41	18.75	27.12
39 SW (24-30, September)	15.18	10.49	22.51	17.32
40 SW (01- 07, October)	12.18	2.75	15.86	9.03

correlation was recorded in D_3 (0.71) and D_4 (0.69) sown crop. The other two weather parameters *viz.*, rainfall and sunshine hours did not show any significant influence on defoliation due to *H. armigera*. Sunshine hours exhibited positive significant correlation (D_4 = - 0.64) in D_4 sown crop with respect to foliar damageby *H. armigera*.

With respect to foliar damage by *S. litura* the maximum temperature showed a negative correlation in all dates of sowing (D_1, D_2, D_3 and D_4). However, a significant negative correlation (- 0.55) was obtained in D_3 sown crop. Minimum temperature also exhibited the same trend where in all the correlation coefficients are negative with respect to dates of sowing, however a significant negative correlation (- 0.64) was recorded in D_3 sown crop. The morning and evening relative humidity were observed to have significant positive association with D_3 (first fortnight of July) (0.66 and 0.79, respectively) and D_4 (second fortnight of July) (0.56 and 0.57, respectively) sown crops. The weather parameter *viz.*, sunshine hours showed significant positive association (0.55) in D_2 (second fortnight of July) sown crop, whereas rainfall even though showed a positive correlation in all the dates of sowing it was non-significant.

During *kharif*, 2022, maximum temperature in all the dates of sowing (D_1, D_2, D_3 and D_4) is negatively correlated with foliar damage by *H. armigera*. However, a significant negative correlation (-0.55) was recorded in D_2 sown crop. Similarly, minimum temperature exerted significant negative correlation (D_1 = - 0.87, D_2 = - 0.65, D_3 = - 0.74 and D_4 = - 0.84) on the foliar damage by *H. armigera* in all dates of sowing. The weather parameters *viz*., morning relative humidity, evening relative humidity and sun shine hours in all the dates of sowing (D_1, D_2, D_3 and D_4) are positively correlated with foliar damage by *H. armigera*. However, a significant positive correlation 0.50) was recorded in D_4 sown crop. The weather parameter, rainfall is positively correlated in D_1 and D_4 sown crops and negatively correlated in D_3 and D_4 sown crops with respect to foliar damage by *H. armigera*.

For *S.litura*, the maximum temperature showed a negative correlation in all dates of sowing (D_1, D_2, D_3 and D_4). However, a significant negative correlation (- 0.53) was obtained in D_3 sown crop. Minimum temperature also exhibited the same trend where in all the correlation coefficients were negative with respect to dates of sowing, however a significant negative correlation (- 0.84, - 0.66 and – 0.74) was recorded in D_1, D_2 and D_3 sown crops. The weather parameter *viz.*, morning relative humidity was positively correlated (D_1, D_2, D_3 and D_4) in all the dates of sown crops. However, a significant positive correlation (0.50 and 0.60) was recorded in D_2 and D_3 sown crops. Evening relative humidity was also positively correlated (D_1, D_2, D_3 and D_4) in all the dates of sown crops. However, a significant positive correlation (0.58 and 0.53) was recorded in D_3 and D_4 sown crops, whereas rainfall even though showed

Table 3. Mean foliar damage due to lepidopteran insect pests on groundnut during *kharif*, 2021 and *kharif*, 2022 - Third date of sowing (D_3) (15th July)

Standard week (SW)	Mean foliar damage (%)			
	Helicoverpa armigera		*Spodoptera litura*	
	2021	2022	2021	2022
33 SW (13-19, August)	9.09	7.32	16.72	9.01
34 SW (20-26, August)	19.46	11.48	30.54	18.73
35 SW (27 August - 02, September)	22.26	28.77	31.96	34.25
36 SW (3-9, September)	16.67	24.01	28.87	35.35
37 SW (10-16, September)	15.16	19.66	19.32	21.91
38 SW (17-23, September)	17.03	16.75	22.70	18.75
39 SW (24-30, September)	13.17	15.16	17.05	21.52
40 SW (01- 07, October)	9.45	23.03	12.76	28.09
41 SW (08-14, October)	5.76	18.25	10.48	22.93
42 SW (15-21, October)	3.20	3.36	6.73	3.06

positive correlation in all the dates of sown crops (D_1, D_2, D_3 and D_4) but it was non-significant. The weather parameter sunshine hours was positively correlated (0.50) in D_4 sown crop. (Table.5)

REGRESSION ANALYSIS

Regression analysis showed weather parameters *viz.,* maximum, minimum temperature, morning, evening relative humidity, sunshine hours and rainfall influenced an extent of 71, 53, 79 and 82 per cent on defoliation caused by *H. armigera* in groundnut during D_1, D_2, D_3 and D_4, respectively in *kharif*, 2021. During *kharif*, 2022 maximum, minimum temperature, morning, evening relative humidity, sunshine hours and rainfall influenced an extent of 82, 78, 93 and 72 per cent on defoliation on groundnut during D_1, D_2, D_3 and D_4 respectively.

The regression studies of *S. litura* with the weather parameters during *kharif*, 2021 indicated that maximum, minimum temperature, morning, evening relative

Table 4. Mean foliar damage due to lepidopteran insect pests on groundnut during *kharif*, 2021 and *kharif*, 2022- Fourth date of sowing (D_4) (30h July)

Standard week (SW)	Mean foliar damage (%)			
	Helicoverpa armigera		*Spodoptera litura*	
	2021	2022	2021	2022
35 SW (August 27- 02, September)	6.18	3.69	10.36	3.38
36 SW (03- 09, September)	8.89	4.53	11.32	5.83
37 SW (10-16, September)	9.41	8.21	15.01	10.00
38 SW (17-23, September)	12.31	11.75	17.95	20.37
39 SW (24-30, September)	22.80	16.53	26.57	31.50
40 SW (01-07, October)	21.65	20.44	35.45	38.25
41 SW (08-14, October)	23.00	24.14	39.00	39.10
42 SW (15-21, October)	27.80	30.15	46.00	41.45
43 SW (22-28, October)	29.50	31.16	44.50	36.01
44 SW(29 Oct- 4 Nov)	36.40	31.00	39.50	34.30

Table 5. Correlation co-efficient between weather variables and incidence of lepidopteran pests in groundnut during *kharif*, 2021 and *kharif*, 2022

Weather parameters	Correlation co-efficient (r)							
	2021							
	Helicoverpa armigera				*Spodoptera litura*			
	First date of sowing (D_1)	Second date of sowing (D_2)	Third date of sowing (D_3)	Fourth date of sowing (D_4)	First date of sowing (D_1)	Second date of sowing (D_2)	Third date of sowing (D_3)	Fourth date of sowing (D_4)
Maximum temperature (0°C)	-0.41	-0.32	-0.47	-0.62*	-0.45	-0.29	-0.55*	-0.41
Minimum temperature (0°C)	-0.40	-0.43	-0.60*	-0.60*	-0.50*	-0.40	-0.64*	-0.48
Moring R.H (%)	-0.10	0.56*	0.64*	0.77*	-0.02	0.56*	0.66*	0.56*
Evening R.H (%)	0.08	0.39	0.71*	0.69*	0.19	0.39	0.79*	0.57*
Rainfall (mm)	0.23	0.29	0.23	-0.19	0.26	0.28	0.21	0.10
Sunshine Hours (SsH)	0.01	-0.23	-0.21	0.64*	0.07	0.19	0.24	0.55*
Weather parameters	**2022**							
	Helicoverpa armigera				*Spodoptera litura*			
	First date of sowing (D_1)	Second date of sowing (D_2)	Third date of sowing (D_3)	Fourth date of sowing (D_4)	First date of sowing (D_1)	Second date of sowing (D_2)	Third date of sowing (D_3)	Fourth date of sowing (D_4)
Maximum temperature (0°C)	-0.46	-0.55*	-0.45	-0.43	-0.43	-0.53*	-0.43	-0.35
Minimum temperature (0°C)	-0.87*	-0.65*	-0.74*	-0.65*	-0.84*	-0.66*	-0.74*	-0.39
Moring R.H (%)	0.17	0.08	0.41	0.43	0.13	0.50*	0.60*	0.41
Evening R.H (%)	0.49	0.33	0.40	0.41	0.47	0.34	0.58*	0.53*
Rainfall (mm)	0.39	-0.16	-0.26	0.18	0.39	0.15	0.22	0.06
Sunshine Hours (SsH)	0.07	0.24	0.14	0.50*	0.09	0.22	0.15	0.50*

*Significance CD = 0.52 @ p = 0.05 at one tail, Significance CD = 0.63 @ p = 0.05 at two tail

Table 6. Regression analysis for the relation between incidence of lepidopteran insect pests and weather factors during *kharif*, 2021 and *kharif*, 2022

Helicoverpa armigera		
Regression equation		
)ates of sowing	**2021**	**Coefficient of determination (R^2)**
ate of sowing (D_1)	321.2197 -7.00155 X_1 -1.70691 X_2 -0.18757 X_3 -0.50993, X_4+2.651695 X_5 -0.01334 X_6	0.71
l fortnight (D_2)	- 283.62 4.201715 X_1 -0.16349 X_2 2.233999 X_3 -0.17455 X_4 -0.74696 X_5 -0.09738 X_6	0.53
date of sowing (D_3)	-419.928 9.771546 X_1 -1.29386 X_2 0.956594 X_3 1.314958 X_4 -2.65384 X_5 -0.08611 X_6	0.79
ı date of sowing (D_4)	14.92834 -11.2473 X_1+11.77477 X_2+1.215782 X_3-0.7468X_4+6.686432 X_5+ 0.117872 X_6	0.82
)f sowing	**2022**	
ate of sowing (D_1)	118.3265 6.453615 X_1 -12.0165 X_2 -1.03653 X_3 1.086269 X_4 -1.13504 X_5 0.00793 X_6	0.82
l fortnight (D_2)	445.3119 0.077418 X1 -7.29679 X2 -5.50359 X3 3.02519 X4 0.273354 X5 0.097187 X6	0.78
date of sowing (D_3)	776.8001 -18.4047 X1 -3.17789 X2 0.90518 X3 -0.91511 X4 8.771017 X5 0.135429 X6 0.93	0.93
ı date of sowing (D_4)	439.9424 -10.6757 X1-0.55966 X2-1.81765 X3+0.853788 X4+6.460412 X5+0.000393 X6	0.72
Spodoptera litura		
)ates of sowing	**2021**	**Coefficient of determination (R^2)**
ate of sowing (D_1)	489.3706 -6.19096 X_1 -7.61825 X_2 -0.49674 X_3 -0.81702 X_4+ 1.776361 X_5 -0.01936 X_6	0.63
l fortnight (D_2)	-517.745 + 7.064629 X_1 +1.779076 X_2 + 3.358092 X_3 + 0.002105 X_4 -1.08943 X_5 -0.14265 X_6	0.56
date of sowing (D_3)	-648.324 16.04526 X_1 -1.94473 X_2 0.642219 X_3 2.639959 X_4 -5.08609 X_5 -0.11233 X_6	0.89
ı date of sowing (D_4)	118.5076-8.9094 X_1 + 6.077934 X_2- 0.13929 X_3+ 0.249232 X_4+ 9.035689 X_5+ 0.189863 X_6	0.72
)ates of sowing	**2022**	**Coefficient of determination (R^2)**
ate of sowing (D_1)	92.73295 9.382541 X_1 -14.4944 X_2 -1.54485 X_3 1.681421 X_4 -1.40487 X_5 0.007286 X_6	0.80
l fortnight (D_2)	457.3551 3.590524 X_1 -11.0418 X_2 -6.64691 X_3 4.041342 X_4 -0.14919 X_5 0.104908 X_6	0.75
date of sowing (D_3)	970.86 -23.4267 X_1 -3.54823 X_2 -0.96094 X_3 -1.33558 X_4 11.09691 X_5 0.191616 X_6	0.95
ı date of sowing (D_4)	739.1206 -15.83 X_1-0.47057 X_2-4.58289 X_3+2.307217 X_4 +8.682458 X_5-0.00945 X_6	0.55

X_1= Maximum temperature (0^0c), X_2= Minimum temperature (0^0c), X_3= Moring Relative Humidity (%), X_4= Evening Relative Humidity (%), X_5= Sunshine Hours (SsH), X_6= Rainfall (m.m)

humidity, sunshine hours and rainfall influenced an extent of 63, 56, 89 and 72 per cent on defoliation in groundnut in first date of sowing (D_1), second date of sowing (D_2), third date of sowing (D_3) and fourth date of sowing (D_4), respectively.

During *kharif,* 2022, maximum, minimum temperatures, morning, evening relative humidities, sunshine hours and rainfall influenced an extent of 80, 75, 95 and 52 per cent of defoliation in groundnut in first date of sowing (D_1), second date of sowing (D_2), third date of sowing (D_3) and fourth date of sowing (D_4), respectively (Table.7 and 8).

The increase in the mean foliar damage in fourth date of sowing (D_4) and third date of sowing (D_3) due to *H. armigera* and *S.litura* was due to the influence of morning relative humidity prevailing during *kharif*, 2021 and *kharif*, 2022 and the same was reported by Dhandapani (1985) who recorded seasonal activity of *S. litura* on groundnut fields and indicated maximum larval population was recorded from 32nd to 36thmeteorological weeks with a peak in first week of September.

The present results are in conformity with Hegde *et al*. (2016) who reported that maximum temperature (r = -0.665) showed significant negative influence and significant positive influence (r = 0.701) on trapping of moth catches of *S. litura* from 1990 – 2000 on groundnut. Basavaraj *et al*. (2013) also reported the significant negative impact of minimum temperature (r = - 0.077 and – 0.671), significant positive effect of sunshine hours (r = 0.174 and r = 0.336) on *S. litura* and *H. armigera* incidence on sunflower.

Harish *et al*. (2015) also reported significant positive association of weather parameters *viz*., maximum temperature (0.56) and sunshine hours (0.64) with the incidence of *H. armigera* during *kharif* season in groundnut.

Nigude *et al*. (2016) reported positive significant correlation with temperature and relative humidity on incidence of tobacco caterpillar on groundnut. The same was supported by Aravind (2014) and Radhika (2013)

Naresh *et al*. (2017) reported that maximum temperature (r = -0.88 and - 0.85), minimum temperature (r = -0.85 and -0.85) showed significant negative influence on the incidence of *S. litura* and morning relative humidity (r = 0.80 and 0.74) and evening relative humidity (r = 0.81 and 0.77) were significant positive influence on the incidence of tobacco caterpillar on groundnut. Venkataiah *et al*. (2011) also reported that maximum and minimum temperatures were negatively correlated with *S. litura* damage.

The studies indicated that maximum and minimum temperatures showed a negative impact on foliar damage by *H. armigera* for all the four dates of sown groundnut crop (D_1, D_2, D_3 and D_4) and a significant negative correlation with minimum temperature for the foliar damage in D_3 (-0.60) and D_4 (-0.60) sown groundnut in kharif, 2021 and in *kharif*, 2022, The minimum temperature showed a significant negative association for *H. armigera* (- 0.87, - 0.65, - 0.74, - 0.65) in all the four dates of sowing.

The minimum temperature (-0.64) showed significant negative influence on foliar damage by *S. litura* in July first fortnight sown crop. The morning and evening relative humidity had positive association with foliar damage and was significant in D_3 (0.66 and 0.79, respectively) and D_4 (0.56 and 0.57, respectively) and only morning relative humidity showed significant influence in D_2 (+0.56) sown groundnut crop in *kharif*, 2021.In *kharif*, 2022, minimum temperature pertaining to first date (D_1), second date (D_2) and third (D_3) date sown crop showed significant negative influence (-0.84, -0.66 and -0.74, respectively) and non significant influence in forth date of sowing *i.e*., D_4 (- 0.39).

LITERATURE CITED

Aravind, K. 2014. Influence of weather parameters on pheromone trap catches of *Spodoptera litura* Fab. *Journal of Agri Search*. 1(4): 238- 241.

Basavaraj, K., Geetha, S., Jagadish, K.S., Mohan, I., Naik and Shadakshari, Y.G. 2013. Influence of meteorological factors on sex pheromone trap catches of *Helicoverpa armigera* (Hub.) and *Spodoptera litura* (Fab.) in sunflower (*Helianthus annuus* L.). *Current Biotica*. 7(3): 174-182.

Dhandapani, N. 1985. Trapping of *Spodoptera litura* (Fab.) moths using sex pheromone. *Madras Agricultural Journal*. 72: 235-238.

Directorate of Economics and Statistics, Ministry of Agriculture and Farmer's Welfare. 2022. Area, production and productivity of groundnut. 227.

Harish, G., Nataraja, M.V., Jasrotia, P., Holajjer, P., Savaliya, S.D. and Gejera, M. 2015. Impact of weather on the occurrence pattern of insects pests on groundnut. *Legume Research*. 38(4): 524-535.

Hegde, M.G., Santoshakumara, M.A, Yenagi, B.S and Patil R.K. 2016. Influence of weather parameters on pheromone trap catches of *Spodoptera litura* male moth. *Journal of Experimental Zoology*. 19(2): 1173-1176.

Naresh, T., Ramakrishna Rao, A, Murali Krishna, T, Devaki, K, Khayum Ahammed, S and Sumati, P. 2017. Seasonal incidence of leaf miner (*Aproaerema modicella*) on groundnut (*Arachis hypogaea* L.) during *rabi* season. *Journal of Entomology and Zoology Studies*. 5(6): 92-96.

Nigude, V.K., Patil, S.A., Mohite, P.B and Bagade, A.S. 2018. Seasonal incidence of tobacco caterpillar and leaf miner of groundnut (*Arachis hypogaea* L.). *International Journal of Current Microbiology and Applied Sciences*. 7(1): 562-565.

Radhika, P. 2013. Influence of weather on the seasonal incidence of insect pests on groundnut in the scarce rainfall zone of Andhra Pradesh. *Advance Research Journal of Crop Improvement*. 4(1): 123-126.

Venkataiah, M., Anil Kumar, B., Krushna Mohan., T, Sreedhar, C., Venkanna, V and Bhupal Raj, G. 2011. Impact of weather parameters on population dynamics of *Spodoptera litura* Fab. and yield in groundnut (*Arachis hypogaea* L.). Proceedings: National conference on "Conquering impact of Climate Change on Agriculture through Organic Farming – A Global Perspective". 131-143.