# Original Research Article

# Population dynamics of spotted stem borer,*Chilopartellus* (Swinhoe) and pink stem borer,*Sesamiainferens* (Walker) on *rabi* sorghum


ABSTRACT

During the rabi season, the peak populations of *Chilopartellus* and *Sesamiainferens* were observed under specific weather conditions: no rainfall, maximum temperatures of 32.8°C and 31.9°C, minimum temperatures of 16.7°C and 16.2°C, morning relative humidity of 75.83% and 81.47%, afternoon relative humidity of 43.5% and 48.1%, and wind speeds of 20 km/h and 19.7 km/h, respectively. Correlation analysis revealed that the larval population of *C. partellus* infesting *rabi*sorghum had a significantly positive correlation with morning relative humidity and a significantly negative correlation with wind speed. In contrast, the larval population of *S. inferens* showed a positive but non-significant correlation with rainfall, morning relative humidity, and afternoon relative humidity.By monitoring specific weather conditions, such as humidity and wind speed, and understanding their impact on pest populations, effective interventions can be designed to mitigate the damage caused by *C. partellus* and *S. inferens*. This knowledge is crucial for improving crop yields and ensuring sustainable agricultural practices.



**Key words -** Population, Significant, *C.partellus*, Correlation, *S.inferens*, Relative humidity


## Introduction

Sorghum (*Sorghum bicolor* (L.)Moen.), a crop from the grass family Poaceae, is a warm-climate species originally domesticated in Africa. It was first cultivated in regions of Ethiopia or Chad over 5,000 years ago and later spread to India and other countries (Rosentrater and Evers, 2018). Known as “the sugarcane of the desert” or “the camel among crops,” sorghum is a $C_4$ plant capable of withstanding hot and drought-prone conditions, thriving under both rainfed and irrigated environments (SrinivasRao*et al*., 2013).In India, sorghum is cultivated over an area of 4.09 million hectares, yielding 3.47 million tonnes with an average productivity of 849 kg per hectare (FAOSTAT, 2020). Primarily grown under rainfed conditions, sorghum is cultivated during the kharif (rainy) and rabi (winter) seasons, predominantly in southern and central India[26-28].Sorghum is susceptible to several insect pests, including the shoot fly (*Atherigonasoccata*Rondani), stem borers (*Chilopartellus*Swinhoe and *Sesamiainferens* Walker), armyworms (*Mythimnaseparata* Walker and *Spodopterafrugiperda* J.E. Smith), aphids (*Melanaphissacchari*Zehntner and

*Rhopalosiphummaidis* Fitch), midge (*Contariniasorghicola*Coquillett), head caterpillars (*Helicoverpaarmigera*Hubner), hairy caterpillars (*Orgyia* sp., *Olenemendosa*Hubner, and *Somenascintillans* Walker), shoot bugs (*Peregrinusmaidis*Ashmead), and the green stink bug (*Nezaraviridula* Linnaeus) in Maharashtra. In sorghum fields, insect pests account for over 35% of crop losses, estimated at $580 million annually in India (Reddy and Zehr, 2004). Among the most severe pests are the shoot fly and stem borers (*Chilopartellus*Swinhoe and *Sesamiainferens* Walker), which pose significant threats in India (Mti*et al*., 2014).

## Material and Method

A field experiment, consisting of forty-eight quadrats each measuring 2.70 x 3.00 m², was conducted to investigate the population dynamics of sorghum stem borers on *rabi*sorghum. The study took place at the Research Farm of the Department of Agricultural Entomology, College of Agriculture, Latur (MS) during the rabi season of 2020-2021. The popular sorghum variety ParbhaniMoti was sown with a 45 x 15 cm spacing across 48 quadrats, following the recommended agronomic practices outlined by VNMKV, Parbhani (Anonymous, 2018). The experiment was conducted under pesticide-free conditions. Data on larval population fluctuations were recorded per quadrat. Larvae were collected from three quadrats separately twice during each meteorological week, and the average number of larvae per quadrat was calculated by dividing the total number of larvae by three. Due to low larval counts, estimating the population per plant was impractical for statistical analysis. Statistical analysis of the data, including simple correlation and multiple regression, was performed using WASP 2.0 software developed by ICAR Research Complex, Goa, to examine the relationship between the larval population of stem borers and weather parameters.

## Results and Discussion

### 1. Seasonal occurrence of*Chilopartellus*(Swinhoe)

The first incidence of *Chilopartellus* on sorghum was recorded in the 52nd standard meteorological week (SMW) with an average of 2.00 larvae per quadrat. The population peaked at 5.66 larvae per quadrat during the 4th SMW. At this peak population level, the prevailing weather conditions were as follows: no rainfall, a maximum temperature of 32.8°C, a minimum temperature of 16.7°C, a morning relative humidity of 75.83%, an afternoon relative humidity of 43.5%, and a wind speed of 20 km/h (Table 1).The results of this investigation align with previous studies. Singh *et al*. (2020) reported a maximum larval population of *C. partellus* on maize during the 31st SMW, with an average of 3.8 larvae per plant. Patel and Purohit (2016) observed that the incidence of *C. partellus* on sorghum began in the fourth week of November (0.06 larvae per plant) and continued until the first week of February, peaking in the second and fourth weeks of December (0.15 larvae per plant). Divya*et al*. (2009) found that the highest number of *C. partellus* larvae were recorded during the 40th SMW (30 larvae per 50 plants) in the kharif season and the 3rd SMW (19 larvae per 50 plants) in the rabi-summer season. Achiri*et al*. (2020) noted two major peaks in the larval population of *C. partellus* on maize: one during the first growing season (March-June) and another at the beginning of the second growing season (June-September). Suresh Kumar and Arivudainambi (2018) reported that the peak larval population of *C. partellus* on maize occurred in July during the kharif season, with a decline throughout the rabi season. Ram Kumar *et al*. (2017) found that *C. partellus* on maize appeared in the 2nd week of August and peaked at 2.4 larvae per plant in the 38th SMW (3rd week of September, 2016).

**Correlation between weather parameters and *C. partellus* infestation**

The results in respect of simple correlations between larval population of *C. partellus*infesting sorghum and weather parameters during *rabi*season 2020-21 are presented in (Table.2). Thedatarevealedthatbeforenoonrelativehumidity(r=0.533*)exhibited positively significant correlation with larval population of *C. partellus*andwindspeed(r=-0.549*)exhibitednegativelysignificantcorrelationwithlarvalpopulation of *C. partellus*. However, maximum temperature (r= -0.185) and minimumtemperature (r= -0.198) were negatively non-significant, while rainfall (r= 0.009) andafternoon relative humidity (r= 0.294) showed positive but non-significant correlationwithlarvalpopulation of *C. partellus*.(Table.1).

The findings of the present investigation are consistent with those of Akshay Kumar *et al*. (2020), who reported that maximum and minimum temperatures were negatively correlated with the dead heart percentage of *Chilopartellus* on maize, while relative humidity showed a positive correlation. Additionally, rainfall was positively correlated with dead heart percentage during 2015. Arshad*et al*. (2021) noted that higher relative humidity caused marked fluctuations in the population dynamics of *C. partellus* on maize. Achiri*et al*. (2020) found that temperature and humidity did not significantly affect the mean number of *C. partellus* larvae on maize during the first and second cropping seasons. Suresh Kumar and Arivudainambi (2018) observed that the larval population of *C. partellus* was negatively correlated with maximum temperature and had an insignificant relationship with minimum temperature. They also found that increased relative humidity positively correlated with the larval population. Rainfall showed a significant positive correlation with larval population in Karimnagar, Medak, and Renga Reddy districts but was insignificant in Warangal district.

Ram Kumar *et al*. (2017) reported a significant negative correlation between *C. partellus* larval population on maize and maximum temperature and sunshine. Minimum temperature had a positive but non-significant effect, while relative humidity had a positive and highly significant effect on the stem borer population. Lekha*et al*. (2017) demonstrated a significant negative correlation between *C. partellus* on sorghum and mean relative humidity (r= -0.94). Patel and Purohit (2016) found that maximum, minimum, and average temperatures had a significant negative association with *C. partellus* on rabi sorghum, while humidity, rainfall, rainy days, sunshine hours, wind velocity, and evaporation showed no significant association. Dindor*et al*. (2016) revealed that minimum temperature and wind velocity negatively impacted *C. partellus* infestation on maize, affecting damaged plants and the leaf injury scale. Zulfiqar*et al*. (2010) indicated that relative humidity and temperature significantly influenced the population of *C. partellus* on maize. Ahad*et al*. (2008) found a positive correlation between the adult population of *C. partellus* and relative humidity.

**Regression studies of *C. partellus*infestation on *rabi*sorghum**

Weather based multiple linear regression model was developed in respect of seasonal incidence of *C. partellus*(Y) as a dependent variable and weather parameters (B1 to B6) as independent variables and presented in (Table 2). The regression equation revealed that the various weather parametershadprofoundinfluenceonseasonalincidenceof*C.partellus*onsorghum.Thecoefficient of determination ($R^2$) was 0.671 which indicated that different weatherparameterscontributed 67.1per centvariabilityin larvalpopulation of *C. partellus*.

**2. Population dynamics of*Sesamiainferens*(Walker)**

The first incidence of *Sesamiainferens* on *rabi* sorghum was recorded in the 52nd standard meteorological week (SMW), with an average of 1.33 larvae per quadrat. The population reached its peak at 4.00 larvae per quadrat in the 3rd SMW. At this peak population level, the prevailing weather conditions were: no rainfall, a maximum temperature of 31.9°C, a minimum temperature of 16.2°C, a morning relative humidity of 81.47%, an afternoon relative humidity of 48.1%, and a wind speed of 19.7 km/h (Table 1).

The findings of the present investigation align with those of Suresh Kumar and Arivudainambi (2018), who reported that the larval population of *Sesamiainferens* on maize was low during the kharif season and peaked in January during the rabi season, with larval populations ranging from 0.80-4.12, 0.60-4.20, and 0.40-4.20 larvae per plant in Karimnagar, Medak, and Warangal, respectively. Sharma *et al*. (2017) observed that the larval population of *S. inferens* on maize increased after the 45th SMW, reached its maximum during the 49th

SMW, and then declined until the 7th SMW. Reuolin and Soundararajan (2019) recorded the larval population of *S. inferens* on rice during the 11th SMW (first fortnight of March). Umesh Kumar *et al*. (2018) noted peak larval populations of *S. inferens* on maize (6.17 and 6.93 larvae per plant) in the third week of August (34th SMW) during the *kharif* seasons of 2016 and 2017, respectively. Sanjay Kumar *et al*. (2017) found that the peak infestation period of *S. inferens* on maize was observed at 70 days after sowing (DAS), with an average of 22.38 pinholes per plant. Deole*et al*. (2017) reported that the larval population on maize peaked at 13.81 and 18.56 larvae per plant in the 12th and 11th SMW during the spring seasons of 2013-14 and 2014-15, respectively. Deole (2016) observed maximum activity of *S. inferens* larvae and adults during the second and third weeks of March (11th and 12th SMW). Singh and Kular (2015) revealed that the maximum incidence of *S. inferens* in a rice-wheat cropping system occurred in September-October (2.76-4.17 per cent), with smaller peaks observed in December and February.

**Correlation between weather parameters and *S. inferens*infestation**

The results in respect of simple correlations between larval population of *S. inferens*infesting sorghum and weather parameters during *rabi*season 2020-21 are presented in table. 1. The data evidenced that the rainfall (r= 0.054), before noon relativehumidity (r= 0.372) and afternoon relative humidity (r= 0.139) exhibited positive butnon-significant correlation with larval population of *S. inferens*. While, maximumtemperature (r= -0.107), minimum temperature (r= -0.168) and wind speed (r= -0.401)showednegativenon-significantcorrelationwith *S.inferens*larvalpopulation.

**Regressionstudiesof *S. inferens*infestation on *rabi*sorghum**

Weatherbasedmultiplelinearregressionmodelwasdevelopedinrespect of seasonal incidence of *S. inferens*(Y) as a dependent variable and weatherparameters(B1to B6)as independentvariables andpresentedintable2.The regression equation revealed that the various weather parametershadprofoundinfluenceonseasonalincidenceof*S.inferens*onsorghum.Thecoefficient of determination ($R^2$) was 0.433 which indicated that different weatherparameterscontributed43.3 percentvariabilityinlarvalpopulationof *S.inferens*.

**Conclusion**

The study investigated the relationship between weather conditions and the populations of *Chilopartellus* and *Sesamiainferens* on *rabi* sorghum. *C. partellus* was significantly affected by morning humidity (positively) and wind speed (negatively). *S. inferens* showed a positive but non-significant correlation with rainfall and humidity. Understanding these correlations helps predict pest outbreaks and plan effective interventions, improving crop yields and promoting sustainable agriculture. This information is valuable for farmers, agricultural services, researchers, and policymakers in developing precise pest management strategies.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc have been used during writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.

2.

3.

## References

Achiri, A.D., Atakan, E. &Pehlivan, S. (2020). Seasonal fluctuations and development ofdegree-day models for *Chilopartellus*(Lepidoptera: Crambidae) in maizefields in the Mediterranean region. *European Journal of Entomology*. 117,68-75.

Ahad, I., Bhagat, R.M., Ahmad, H. &Monobrullah, M. (2008). Population dynamics of maize stem borer, *Chilopartellus*Swinhoe in Upper Himalayas of Jammu region. *Journal of Bioscience*. 16, 137-138.

Akshay Kumar, Singh, R.S., Kripa Shankar, Vikrant &Devendra Singh.(2020). Population dynamics of major insect-pest and natural enemies on maize crop.*International Journal of Current Microbiology and Applied Science*. 9(2), 1299-1307.

Anonymous, (2018). Cultivation practices of crops. *KrishiDainandini*, *VNMKV*, *Parbhani*. 103-120

Arshad, M., Rasib, K.Z., Ali, G., Amanat, T., Munir, A. &Riaz, S. (2021). Effect of weather parameters on pest dynamics of maize in summer at district Bahawalnagar (Pakistan).*Egyptian Academic Journal of Biological Sciences.*14 (1),195-203.

Deole, S. (2016). *Studies on pink stem borer, Sesamiainferens Walker of maize, Zea mays L. with particular reference to neonate larval behaviour and its management* (*Doctoral Dissertation*). Indira Gandhi KrishiVishwavidyalaya, Raipur (MP), India.

Deole, S., Dubey, V.K. &Rana, D.K. (2017). Population dynamics of pink stem borer on maize crop and its correlation with prevailing abiotic parameters. *International Journal of Current Microbiology and Applied Sciences*.6(8), 3006-3015.

Dindor, M.U., Bharpoda. T.M., Patel., B.H., Chaudhary, R.I. & Patel, R.J. (2020). Population dynamics and influence of weather factors on stem Borer, *Chilopartellus*(Swinhoe) infesting maize. *Ecology*, *Environment and Conservation*. 22 (4), 1983-1986.

Divya, K., Marulasiddesha, K.N., Krupanidhi, K. &Sankar, M. (2009). Population dynamics of spotted stem borer, *Chilopartellus*(Swinhoe) and its interaction with natural enemies in sorghum. *Indian Journal of Science and Technology*. 3(1), 70-74.

FAOSTAT, (2020).http://www.fao.org/faostat/en/#data/QC.

Lekha, Swami H., Sapna. &Jat, S.K. (2017).Seasonal incidence of insect pests in sorghum.*Trends in Biosciences*. 10 (48), 9649-9651.

Meti, P., Sreenivas, A.G., Prakash, K., Jat, M.L., Venkateshalu, Prabhuraj, A., Manjunath, N. & Singh, Y.K. (2014). Population dynamics of shoot fly and stem borer of maize under conservation agriculture system. *Journal of Experimental Zoology*. 17 (2), 563-566.

Patel, D. R. &Purohit, M. S. (2016). Effect of different weather parameters on population of stem borer, *Chilopartellus*Swinhoe infesting *rabi*sorghum. *International Journal of Economic Plants*. 3(1), 001-003.

Ram Kumar, Tanweer, Alam& Mukherjee, Udayan. (2017). Studies on seasonal incidence of *Chilopartellus*(Swinhoe) on maize with relation to abiotic factors.*Journal of Experimental Zoology*. 20 (2), 1075-1078.

Reddy, K.V.S. &Zehr, U.B. (2004).Novel strategies for overcoming pests and diseases in India (Symposia papers 3.7). In: T. Fischer, N. Turne, and J. Angus, et al. (eds.), *New Directions for a Diverse Planet: proceedings of the 4th International Crop Science Congress*. Gosford, NSW, Australia. The Regional Institute Ltd. 1-8.

Reuolin, S.J. &Soundararajan, R.P. (2019). Study on impact of weather parameters on the incidence of stem borer complex on rice. *Journal of Entomological Research*.43 (4), 487-490.

Rosentrater, Kurt A. & Evers, A.D. (2018).Introduction to cereals and pseudocereals andtheir production. In: Kurt A. Rosentrater and A.D. Evers (eds), WoodheadPublishingSeriesinFoodScience,TechnologyandNutrition,Kent'sTechnologyofCereals(FifthEdition),WoodheadPublishing,1-76.https://doi.org/10.1016/B978-0-08D.

Sanjay Kumar, Deole, S., Yadu, Y.K. & Dash, D. (2017). Incidence of pink stem borer and natural enemies in different sowing dates of maize. *Journal of Pharmacognosy and Phytochemistry*. 6 (5), 1316-1320.

Sharma, H., Jaglan, M.S. &Yadav, S.S. (2017). Population dynamics of pink stem borer, *Sesamiainferens*(Walker) on maize as influenced by weather conditions. *Journal of Applied and Natural Science*. 9 (4), 1975-1980.

Singh, B. &Kular, J.S. (2015). Influence of abiotic factors on population dynamics of pink stem borer *Sesamiainferens*Walker in rice-wheat cropping system of India. *Journal of Wheat Research*. 7 (2), 23-28.

Singh, B. &Kular, J.S. (2015). Influence of abiotic factors on population dynamics of pink stem borer *Sesamiainferens*Walker in rice-wheat cropping system of India. *Journal of Wheat Research*. 7 (2), 23-28.

SrinivasaRao, P., Umakanth, A.V., Belum.,Reddy,V.S., Dweikat, I., Bhargava, S., Kumar, C. G., Braconnier, S., &Patil, J.V. (2013). Sweet sorghum: genetics, breeding and commercialization. In: BP Singh (Ed) *Biofuel Crops: Production, Physiology and Genetics*,pp. 172-198.

Suresh Kumar, R.S. &Arivudainambi, S. (2018). Population dynamics of insect pest on popular maize hybrids.*Life Science Archives*. 4 (4), 1417-1422.

Umesh Kumar, Singh, D.V., Sachan, S.K., Singh, G., Singh, G. &Yadav R.B. (2018).Studies on seasonal incidence of *Sesamiainferens*(Walker) on maize with relation to abiotic factors.*Journal of Pharmacognosy and Phytochemistry*. 7 (4), 2564-2566.

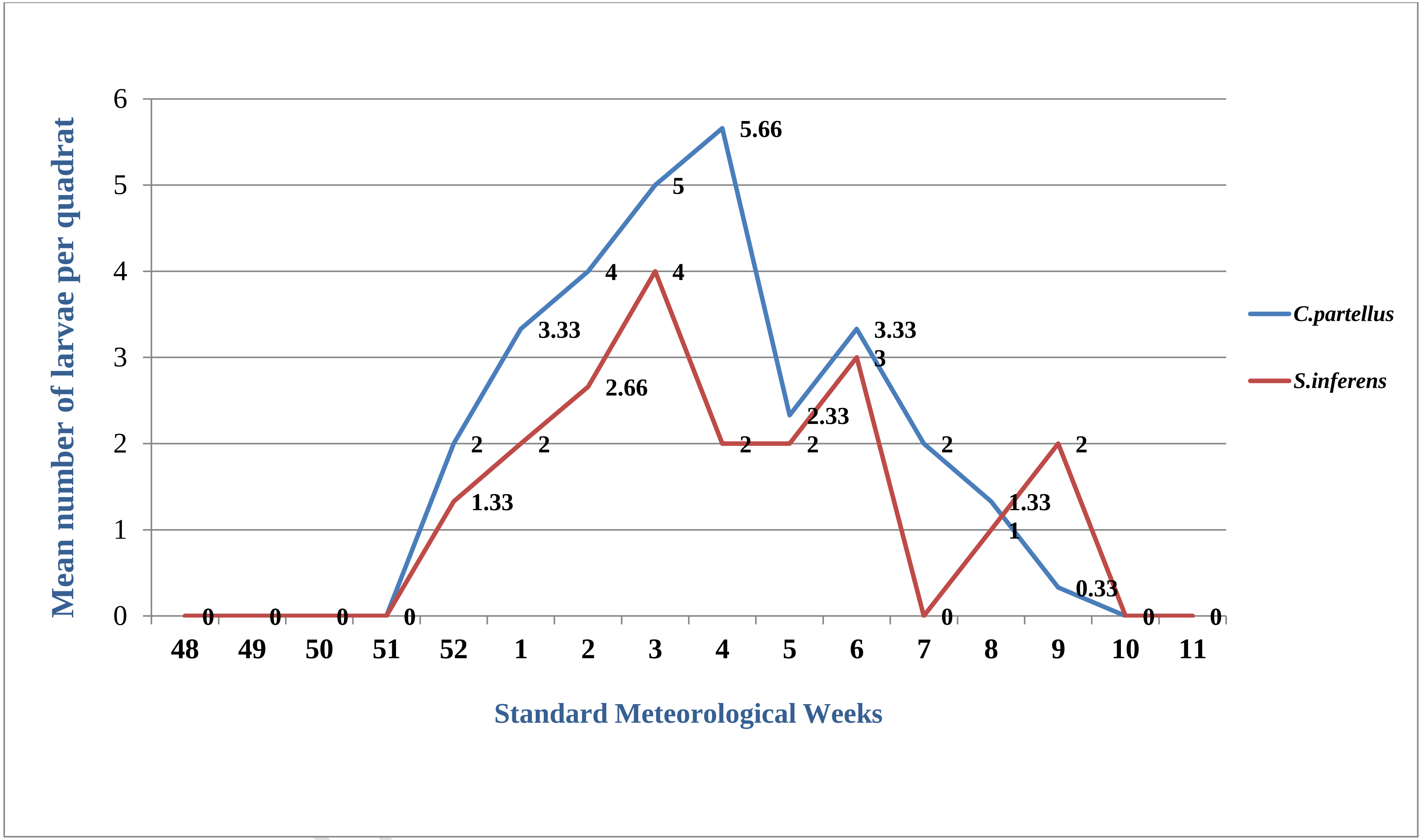
Zulfikar, M.A., Sabari, M.A., Raza, M.A., Hamza, A., Hayat, A. & Khan, A. (2010).Effect of temperature and relative humidity on the population dynamics of some insect pests of maize.*Pakistan Journal of life and Social Sciences*. 8 (1), 16-18.

Emeasor, K. C., &Dioka, U. J. (2019).Control of Maize Stem Borer (Busseolafusca F.) Infestation Using Extracts of Carica papaya and Cymbopogoncitratus and Furadan. *Journal of Experimental Agriculture International*, 29(5), 1–9. https://doi.org/10.9734/JEAI/2019/45920

Hussain, M., Ali, M. Y., Umer, M., Ejaz, N., Bilal, M., Salim, M. A., Noushahi, H. A., Atta, B., &Rizwan, M. (2019).Study of Paddy Stem Borers Population Dynamics and Influencing Environmental Factors through Light Trap.*Asian Journal of Research in Crop Science*, 2(4), 1–10. https://doi.org/10.9734/ajrcs/2018/v2i430035

Amit Kumar AK, Misra AK, PaidiSatyanarayana PS, Jitendra Kumar JK. Population dynamics and management of yellow stem borer (*Scirpophagaincertulas*Walker) with insect sex-pheromone trap.

281




282

**Fig. 1: Population dynamics of *C. partellus* and *S. inferens*on sorghum in relation to weather parameters during *rabi* season2020-21**

**Table 1: Population dynamics of *C. partellus*and *S. inferens*on sorghum in relation to weather parameters during *rabi*season 2020- 21**

| Month | StandardMeteorologicalWeeks | Rainfall(mm) | Temperatue (°C) | | Relative Humidity(%) | | Windspeed (Km perh) | Meannumberoflarvae perquadrat | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min. | Max. | Before noon | After noon | | *C.partellus* | *S.inferens* |
| November 2020 | 48 | - | 17.5 | 29.4 | 79.4 | 64.5 | 22.3 | 0 | 0 |
| December2020 | 49 | - | 13.1 | 31.3 | 67.4 | 39.5 | 21.6 | 0 | 0 |
| | 50 | - | 15.6 | 31.2 | 67.7 | 45.2 | 21.4 | 0 | 0 |
| | 51 | - | 12.2 | 29.5 | 74.4 | 42.4 | 20 | 0 | 0 |
| | 52 | - | 12.8 | 30.5 | 75.4 | 43.6 | 18.4 | 2.00 | 1.33 |
| January2021 | 1 | - | 16.5 | 30.4 | 91.2 | 53.4 | 18.7 | 3.33 | 2.00 |
| | 2 | 1.00 | 16.86 | 31.9 | 82.53 | 51.5 | 19.9 | 4.00 | 2.66 |
| | 3 | - | 16.2 | 31.9 | 81.47 | 48.1 | 19.7 | 5.00 | 4.00 |
| | 4 | - | 16.7 | 32.8 | 75.83 | 43.5 | 20 | 5.66 | 2.00 |
| | 5 | 1.25 | 15.39 | 31.6 | 76.99 | 37.7 | 23.1 | 2.33 | 2.00 |
| February2021 | 6 | 0.5 | 11.99 | 30.9 | 60.24 | 32.5 | 21.7 | 3.33 | 3.00 |
| | 7 | - | 15.44 | 32.9 | 65.86 | 36.3 | 24 | 2.00 | 0 |
| | 8 | 6.25 | 14.6 | 30.8 | 72.9 | 39.6 | 25.7 | 1.33 | 1.00 |
| | 9 | - | 18.49 | 36 | 48.81 | 24.8 | 26.1 | 0.33 | 2.00 |
| March2021 | 10 | - | 23.4 | 37 | 42.48 | 25.8 | 26.1 | 0 | 0 |
| | 11 | - | 19.1 | 36.7 | 42.31 | 22.3 | 27.8 | 0 | 0 |
| ‘r’ valuesof *C.partellus* | | 0.009 | -0.185 | -0.198 | 0.533* | 0.294 | -0.549* | | |
| ‘r’ valuesof*S. inferens* | | 0.054 | -0.107 | -0.168 | 0.372 | 0.139 | -0.401 | | |

Table2:Multipleregressionsofweatherparameterswith*C.partellus*and *S. inferens*on*rabi*sorghum

**Multipleregressionsofweatherparameterswith*C.partellus*on*rabi*sorghum**

| **Weatherparameters** | **Reg.coefficients (b)** | **SE (b)** | **Ttest** | **T table(0.05)** |
|---|---|---|---|---|
| Rainfall(mm)(B1) | 0.221 | 0.317 | 0.698 | 2.262 |
| Maximumtemperature(ºC)(B2) | 1.315 | 0.707 | 1.860 | 2.262 |
| Minimumtemperature(ºC)(B3) | -0.375 | 0.408 | -0.919 | 2.262 |
| Beforenoonrelative humidity(%)(B4) | 0.127 | 0.083 | 1.529 | 2.262 |
| Afternoonrelativehumidity(%)(B5) | 0.029 | 0.133 | 0.218 | 2.262 |
| Windspeed(kmper h) (B6) | -0.400 | 0.331 | -1.210 | 2.262 |

Intercept(a) =-35.694
**Coefficientofdetermination(RSquare) =0.671**
Multiple Correlation Coefficient (R) =0.819StandardError = 1.440

Theregressionequationworked outisasfollow.
Y= -35.694 + (0.221) x B1 + (1.315) x B2 + (-0.375) x B3 + (0.127) x B4 + (0.029) xB5 +(-0.400) x B6 +1.440

**Multipleregressionsofweatherparameterswith*S.inferens*on*rabi*sorghum**

| **Weatherparameters** | **Reg.coefficients(b)** | **SE (b)** | **T test** | **T table(0.05)** |
|---|---|---|---|---|
| Rainfall(mm)(B1) | 0.141 | 0.281 | 0.500 | 2.262 |
| Maximumtemperature(ºC)(B2) | 0.593 | 0.627 | 0.946 | 2.262 |
| Minimumtemperature(ºC)(B3) | -0.137 | 0.362 | -0.378 | 2.262 |
| Beforenoonrelative humidity(%)(B4) | 0.075 | 0.073 | 1.019 | 2.262 |
| Afternoonrelativehumidity(%)(B5) | -0.024 | 0.118 | -0.206 | 2.262 |
| Windspeed(kmper h) (B6) | -0.252 | 0.293 | -0.859 | 2.262 |

Intercept(a) =-14.330
**Coefficientofdetermination(RSquare) =0.433**
Multiple Correlation Coefficient (R) =0.658StandardError = 1.277

Theregressionequationworked outisasfollow.
Y=-14.330 + (0.141) x B1 + (0.593) x B2 + (-0.137) x B3 + (0.075) x B4 + (-0.024) xB5 +(-0.254) x B6 +1.277