# Screening of different sesame genotypes against leaf webber and capsule borer, *Antigastra catalaunalis* Dup.

**Abstract**

A study was conducted at experimental farm of PC Unit, Sesame and Niger, College of Agriculture, JNKVV, Jabalpur, Madhya Pradesh, during *Kharif* 2021. Seventy five genotypes including resistance and susceptible checks were screened against leaf webber and capsule borer (*Antigastra catalaunalis* Dup.) under natural infestation condition (field condition). The observations were recorded at different phonological stages viz., vegetative, flowering and capsule stage of the plant growth. Based on percent damages at different phonological stages of plant growth, the entries were categorized in to different resistance categories. None of the screened genotypes were found free from infestation. At vegetative and flowering stage thirteen genotypes were found resistant showing plant damage less than 10% however at capsule maturity stage nineteen genotypes were found resistant showing capsule damage less than 5%. On the basis of overall performance (mean damage) at all the three stages of plant growth the entries viz., $T_{59}$ - S-0644 (7.48%), $T_{73}$ -TKG-306 (7.48%), $T_{67}$ - VCR/81/NO/80/NS/972 (7.63%), $T_{13}$ - IC-1025-A (7.64%), $T_{68}$ - SI- 250 RC (7.67%), $T_{40}$ - NIC-8473 (7.67%) $T_{2}$ - BM-59, (7.69), $T_{48}$ - NIC-8224-A (7.78%), $T_{1}$- 75-120 (7.80%), $T_{57}$ - S-0351 (7.82%) and $T_{38}$ - NIC-8368 (7.88%) were found promising against leaf webber and capsule borer and can be utilized in the resistance breeding programme.

**Keywords: *Antigastra catalaunalis,* genotypes screening, damage and healthy plant**

## Introduction

Sesame (*Sesamum indicum* Linnaeus) is indeed a significant oilseed crop, renowned for its high oil content and adaptability to tropical and subtropical climates. India, being one of the major producers of sesame, plays a crucial role in its global production and export.The versatility of sesame extends beyond its nutritional value. Its oil is not only utilized in cooking but also finds applications in Ayurvedic medicine and various industries such as cosmetics, pharmaceuticals, and even insecticides. Sesame is highly nutritive (oil 50% and protein 25%) and its oil is an excellent vegetable oil because of its high contents of antioxidants such as sesamin, sesamol and sesamolin and its fatty acid composition Suja *et al.,* (2004). However, the cultivation of sesame faces challenges, particularly from insect pests like the sesame leaf webber and capsule borer. These pests can significantly reduce yields by damaging foliage, flowers and capsule. The larvae of *A. catalaunalis* can cause significant damage throughout the growth stages of sesame. They feed on tender foliage by webbing the top leaves which hinder photosynthesis and nutrient absorption, leading to reduced plant vigor and yield. During flowering and pod formation stage they bore into the flowers and pods and feeds on floral contents and developing seeds. Efforts to mitigate pest damage are crucial for realizing the full potential of sesame cultivation in India. Despite these challenges, the growing demand for edible oils, coupled with sesame's potential as an export crop, presents a promising opportunity for farmers. With effective pest management strategies and support, farmers can enhance productivity and capitalize on the market demand for sesame products.

**Material and methods**

The experiment was conducted at the Experimental farm ICAR-Project Coordinating Unit Sesame and Niger, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (Madhya Pradesh) during the *Kharif* season of 2021 aimed to evaluate 75 different genotypes of sesame against leaf webber and capsule borer. Jabalpur, situated in the agro-climatic zone of Kymore Plateau and Satpura Hills, has specific geographical coordinates and altitude that influence its agricultural characteristics. Sesame seeds were sown in rows of three-meter length, replicated thrice using a randomized block design. The spacing between rows was maintained at 30 cm, while the distance between individual plants within a row was kept at 10 cm. This arrangement allows for systematic observation and assessment of each genotype's performance. To monitor the infestation of insect pests, particularly the larval populations of the leaf webber and capsule borer, weekly observations were conducted starting from one week after germination and continuing until crop maturity. Larval populations were recorded from five randomly selected plants representing each genotype. This rigorous monitoring process provides valuable data on the susceptibility of different genotypes to pest infestations and helps in identifying potentially resistant varieties/donor. Overall, this experiment will helps to provides valuable insights for evaluation of different sesame genotypes against leaf webber and capsule borer and providing resistance donor for the development of improved cultivars for sustainable sesame cultivation.

**Results and discussion**

Seventy five genotypes of sesame including resistant (SI-250) and susceptible checks (TC-25) were screened against leaf webber and capsule borer during *Kharif* 2021.

Observations were recorded at different phonological stages of plant growth viz., vegetative, flowering and capsule maturity stage. The results in table (1) revealed that all the screened entries were differed significantly to each other in respect to record the percent plant, flower and capsule damage caused by leaf webber and capsule borer. Percent plant damages were recorded at vegetative stage (30 DAS) and it was varying from 7.67 to 43.52%. Among the screened entries the lowest percent plant damage (7.67%) was recorded from the treatment $T_{68}$ -SI-250 followed by treatment $T_{67}$ - VCR/81/NO/80/NS/972 (8.56%) and $T_{63}$ - SI-1004-B (8.57%) however the highest percent plant damage (43.52%) was received from the treatment $T_{75}$ –Prachi followed by $T_{15}$ - IC-204200 (42.49%) and $T_6$ -EC-334981-A (42.48%). Among the treatments, the treatments viz $T_{68}$ -SI-250, $T_{67}$ - VCR/81/NO/80/NS/972, $T_{63}$ - SI-1004-B, $T_{13}$ - IC-1025-A, $T_{59}$ - S-0644 and $T_{50}$ - NIC-B-240-A were found at par to each other in respect to record the lowest percent plant damage. Present findings are in conformity with the findings of Panday et al (2021) they tested the feeding preference studies of leaf webber and capsule borer against different genotypes of sesame and reported that the entries SI-271-B, IS-178-C, MT-67-25 and S-OO-17-B were least preferred by the leaf webber and capsule borer and recorded the lowest leaf area damage. All the screened genotypes were grouped in to different categories based on percent plant damage (Table-2). None of the screened genotypes were found free from infestation. thirteen genotypes SI- 250, BM-59 , S-0351, NIC-8473, NIC-8368, VCR/81/NO/80/NS/972, IC-1025-A, 75-120 NIC-B-240-A, S-0644, TKG-306, NIC-8224-A, KMR-53 were found resistant showing plant damage less than 10 percent. The moderately resistant category includes thirty two genotypes showing *Antigastra* damage in the range of 10 -20 percent. Twenty three genotypes were found moderately susceptible and showing plant damage in the range of 21-30 percent and seven genotypes viz., SI-3100, JTS-8, S-0271, EC-334981-A, TC-25, ES-334974 and Prachi were categorized as susceptible, showing infestation in the range of 31-50 percent. Present findings are corroborated with the findings of Makawana *et al.,* (2020) they also screened the genotypes based on percent plant, flower and capsule damage. During vegetative stage (30 DAS), eight genotypes viz., EC-334990, SP-1144, ES-62, SI-2192, IS-446-1-64, ES-335005, SI-250 and IS-178-C were found resistant showing plant damage <10%.

Flower damage was recorded at 45 days after sowing that was varying from 8.33 to 43.33%. Among the screened genotypes the lowest flower damage (8.33%) was received from the treatment $T_{68}$ - SI- 250 followed by $T_{73}$ -TKG-306 (8.63%) and $T_2$ - BM-59 (8.90%) while the highest flower damage (43.33%) was noted in $T_{75}$ –Prachi followed by $T_8$ - ES-

334974 (42.10%) and $T_{69}$ - TC-25 SC (40.00%). Among the treatments, the treatments viz $T_{68}$ -SI-250, $T_{73}$ -TKG-306, $T_2$ - BM-59, $T_{48}$ - NIC-8224-A, $T_{50}$ - NIC-B-240-A, $T_{1-}$ 75-120, $T_{59}$ - S-0644, $T_{13}$ - IC-1025-A, $T_{57}$ - S-0351, $T_{38}$ - NIC-8368 and $T_{67}$ - VCR/81/NO/80/NS/972 were found at par to each other in respect to record the lowest percent flower damage. The sesame genotypes were grouped in to different categories based on percent flower damage (Table-3). Thirteen genotypes SI- 250, BM-59,S-0351,NIC-8473, NIC-8368,VCR/81/NO/80/NS/972, IC-1025-A, 75-120 NIC-B-240-A,S-0644, TKG-306, NIC-8224-A, KMR-53 were found resistant showing flower damage less than 10 percent. The moderately resistant category includes thirty two genotypes showing *Antigastra* damage in the range of 10 to 20 percent. Twenty three genotypes were found moderately susceptible and showing flower damage in the range of 21 to 30 percent and seven genotypes *i.e.*SI-3100, JTS-8, S-0271, EC-334981-A, TC-25, ES-334974 and Prachi were categorized as susceptible. Our findings are supported by the findings from the experiment conducted by Panday *et al.*, (2021) they tested different genotypes of sesame against leaf webber and capsule borer both under natural (field condition) and artificial pest load conditions. Under artificial pest load condition the entries viz., SI-271-B, NIC-9839 and MT-67-25 showed the lowest damage whereas under natural condition, the entries IS-178-C and SP-3267 were superior to others in respect to lowest damage.

Capsule damage was recorded at 70 days after sowing and it was varying from 4.00 to 23.45%. Among the screened the entries the lowest capsule damage (4.00%) was received from the treatment $T_{68}$ - SI- 250 followed by $T_{40}$ - NIC-8473 (4.10%) and $T_{59}$ - S-0644 (4.28%) however the highest capsule damage (23.45%) was recorded from the treatments $T_6$ - EC-334981-A followed by $T_{75}$-Prachi (23.25) and $T_8$ - ES-334974 (21.33). Present findings are supported by the findings of Panday *et al.*, (2021) they tested 197 entries of sesame at three diverse climatic locations of India *viz.*, Jabalpur, Mandor and Vriddhachalam, against leaf webber and capsule. None of the screened entry was found to be free from infestation by leaf webber and capsule borer. Capsule damage over the locations varied from 3.33 to 15.43%. Among the screened entries, the entries SI-0018-B (3.33%), MT-67-25 (3.65%) and RJS- 56-A (3.80%) were recorded the lowest capsule damage.

The sesame genotypes were grouped in to different categories based on percent capsule damage (Table - 4). None of the screened genotypes were found free from infestation. Nineteen genotypes *viz.*, SI- 250, NIC-8368, NIC-8473, S-0644,75-120**,** IS-265-B , NIC-B-240-A, SI-1004-B, S-0351, SI-3315-6-1, BM-59, IS-3051, TKG-306 ,NIC-

8224-A, IC-1025-A ,RJS-147-1-84-B, KMR-53, VCR/81/NO/80/NS/972, ES-47 were found resistant showing capsule damage in the range less than 5 percent. Twenty five genotypes were found moderately resistant showing capsule damage in the range 5 to 10 percent. The Moderately susceptible category includes twenty one genotypes showing *Antigastra* damage in the range of 11 to 15 percent. Ten genotypes were found susceptible and showing capsule damage in the range of 16 to 25 percent. Present findings are in conformity with the findings of Choudhary *et al.,* (2018) they screened 15 varieties of sesame against *A. catalaunalis* and ranked under different categories. The varieties, RT-358 (4.63), RT-370 (4.38) and RT-371 (4.18) were ranked as least susceptible, while LT8 (7.93), TC-25 (6.78) and RT-46 (7.88) as highly susceptible.

On the basis of overall performance (mean damage) at all the three stages of plant growths the entries viz., $T_{59}$ - S-0644 (7.48%), $T_{73}$ -TKG-306 (7.48%), $T_{67}$ - VCR/81/NO/80/NS/972 (7.63%), $T_{13}$ - IC-1025-A (7.64%), $T_{68}$ - SI- 250 RC (7.67%), $T_{40}$ - NIC-8473 (7.67%) $T_{2}$ - BM-59, (7.69), $T_{48}$ - NIC-8224-A (7.78%), $T_{1}$- 75-120 (7.80%), $T_{57}$ - S-0351 (7.82%) and $T_{38}$ - NIC-8368 (7.88%) were found promising against leaf webber and capsule borer and can be utilized in the resistance breeding programme after confirmation of resistance under artificial pest load condition. Present findings are corroborated with the findings of Makawana *et al.,* (2020) they also screened the genotypes based on percent plant, flower and capsule damage that were observed to be from 7.94 to 54.43%, 8.67 to 45.45% and 7.73 to 32.15% respectively. On the basis of overall performance (damage) at different stages of plant growth the genotypes viz., SI-250 (8.11%), IS-178-C (8.75%) and ES-335005 (9.97%) were found promising. The present findings are also in conformity with the results of Baskaran *et al.* ,(1994), Ahuja and Kalyan (2001), Manisegaran *et al.,* (2001) and Singh (2002). They reported that the genotypes KMR-14 and TKG-22 were moderately resistant against *A. catalaunalis*.

**Conclusion**

Among the screened entries the lowest percent plant (7.67%), flower (8.33%) and capsule damage (4.00%) was recorded from the genotype SI-250 however the highest plant (43.52%) flower (43.33%) and capsule damage (23.45%) was recorded from the genotype Prachi. At vegetative stage the entries VCR/81/NO/80/NS/972 (8.56%) and SI-1004-B (8.57%) at flowering stage the entries viz., TKG-306 (8.63%) and BM-59 (8.90%) while at capsule stage the entries NIC-8473 (4.10%) and S-0644 (4.28%) were found promising against leaf webber and capsule borer. On the basis of overall performance (mean damage) at all the three stages of plant growths the entries viz., $T_{59}$ - S-0644 (7.48%), $T_{73}$ -TKG-306

(7.48%) and $T_{67}$ - VCR/81/NO/80/NS/972 (7.63%) were found promising against leaf webber and capsule borer.

## References


Ahuja DB and Kalyan RK 2001. Field screening of genotypes of sesame against leaf webber/capsule borer, *Antigastra catalaunalis* Dup., gallfly, *Asphondylia sesami* Felt and mite, *Polyphagotarsonemus latus* (Banks). Pest Manag. Econ Zool. **9**(1): 409-412.

Baskaran MRK, Ganesh SK and Thangavelu S 1994. Germplasm screening against sesame leaf roller and pod borer. Madras Agric. J. **81**(11): 618-621.

Choudhary MD, Kumawat KC, Yadav MK, Samota RG. Host plant resistance in sesame genotypes to *Antigastracatalaunalis* Dup. Journal of Entomology and Zoology Studies 2018;6(1):1012-1015.

Makwana Mitesh, Panday A K, Sharma Kuldeep and Mahore Prince (2020) Evaluation of sesame genotypes against leaf webber and capsule borer *Antigastra catalaunalis* (duponchel): Indian Journal of Entomology 82(4): 819-822.

Manisegaran S, Manimegalai N, Puspha J and Mohammed SEN 2001. Non- preference mechanism of resistance in sesame to shoot webber and capsule borer *Antigastra catalaunalis* (Dup.). Annals Plant Prot. Sci. **9**(1): 123-124.

Nadarajan L, Narayanan US. Evidence for a maleproduced sex pheromone in sesame leaf webber, *Antigastracatalaunalis* (Duponchel) (Pyraustidae: Lepidoptera). Journal of Current Science. 2005;88(4):631-634.

Panday AK, Sundaria MM, Chandrasekaran M, Rajani B. (2021) Identification of sources of resistance in sesame against leaf webber and capsule borer (*Antigastracatalaunalis* Dup.) Bangladesh J Bot.;50(3):565-575.

Singh V 2002. Reaction of sesame genotypes to leaf webber and capsule borer *Antigastra catalaunalis* (Duponchel) (Lepidoptera: Pyraustidae). Sesame and Safflower Newslett. 17: 52-53.

Suja KP, Abraham JT, Thamizh SN, Jayalekshmy, Arumughan C. Antioxidant efficacy of sesame cake extract in vegetable oil protection. Food Chemistry 2004;84(3):393-400.

**Table 1: Damage due to leaf webber and capsule borer at different phonological stages of plant growth**

| S. No. | Genotypes | Percent damages due to leaf webber and capsule borer at different phonological stages of plant growth | | | |
|---|---|---|---|---|---|
| | | Plant damage (30 DAS) | Flower damage (45 DAS) | Capsule damage (70 DAS) | Mean damage |
| 1. | $T_{1}$- 75-120 | 9.66 (18.11) | 9.28 (17.73) | 4.46 (12.17) | 7.80 |
| 2. | $T_2$ - BM-59 | 9.33 (17.78) | 8.90 (17.34) | 4.83 (12.67) | 7.69 |
| 3. | $T_3$ -EC-303304 | 12.97 (21.10) | 12.37 (20.58) | 12.63 (20.81) | 12.66 |
| 4. | $T_4$ -EC-303441-B | 12.35 (20.55) | 12.67 (20.83) | 6.15 (14.36) | 10.39 |
| 5. | $T_5$ - EC-334976 | 17.33 (24.51) | 18.30 (25.33) | 9.51 (17.94) | 15.05 |
| 6. | $T_6$ -EC-334981-A | 42.48 (40.68) | 41.83 (40.30) | 23.45 (28.96) | 35.92 |
| 7. | $T_7$ -ES-47 | 10.83 (19.21) | 11.33 (19.67) | 5.33 (13.29) | 9.16 |
| 8. | $T_8$ - ES-334974 | 38.00 (38.06) | 42.10 (40.45) | 21.33 (27.50) | 33.81 |
| 9. | $T_9$ - ES-52-1-84 | 17.27 (24.36) | 17.33 (24.60) | 10.63 (19.02) | 15.08 |
| 10. | $T_{10}$ - GRT-8245 | 23.60 (29.06) | 22.00 (27.97) | 12.13 (20.38) | 19.24 |
| 11. | $T_{11}$ - GRT-839-A | 17.60 (24.80) | 14.00 (21.96) | 7.55 (15.94) | 13.05 |
| 12. | $T_{12}$ - GRT-8330-B | 19.14 (25.94) | 18.27 (25.30) | 9.17 (17.61) | 15.53 |
| 13. | $T_{13}$ - IC-1025-A | 8.73 (17.17) | 9.30 (17.75) | 4.88 (12.76) | 7.64 |
| 14. | $T_{14}$ - IC-131943 | 28.67 (32.37) | 23.07 (28.70) | 15.22 (22.95) | 22.32 |
| 15. | $T_{15}$ - IC-204200 | 42.49 (40.68) | 29.17 (32.68) | 16.21 (23.74) | 29.29 |
| 16. | $T_{16}$ - IC-204550 | 19.25 (26.02) | 21.80 (27.83) | 9.63 (18.06) | 16.89 |
| 17. | $T_{17}$ - IC-132186-A | 22.33 (28.19) | 27.92 (31.89) | 14.38 (22.28) | 21.54 |
| 18. | $T_{18}$ - IC-204832-A | 28.59 (32.32) | 27.33 (31.51) | 13.41 (21.48) | 23.11 |
| 19. | $T_{19}$ - IS-245 | 19.63 (26.30) | 18.17 (25.23) | 8.63 (17.08) | 15.48 |
| 20. | $T_{20}$ - IS-294 | 22.11 (28.04) | 22.19 (28.10) | 11.82 (20.04) | 18.71 |

| S. No. | Genotypes | Percent damages due to leaf webber and capsule borer at different phonological stages of plant growth | | | |
|---|---|---|---|---|---|
| | | Plant damage (30 DAS) | Flower damage (45 DAS) | Capsule damage (70 DAS) | Mean damage |
| 21. | $T_{21}$ - IS-722-1 | 28.18 (32.06) | 24.07 (29.37) | 14.78 (22.60) | 22.34 |
| 22. | $T_{22}$ - IS-1672 | 22.88 (28.57) | 13.33 (21.41) | 8.13 (16.57) | 14.78 |
| 23. | $T_{23}$ - IS-3051 | 12.78 (20.94) | 12.69 (20.87) | 5.00 (12.88) | 10.16 |
| 24. | $T_{24}$ - IS-3131 | 12.28 (20.50) | 16.67 (24.08) | 5.67 (13.76) | 11.54 |
| 25. | $T_{25}$ - IS-265-B | 15.52 (23.19) | 15.83 (23.42) | 4.33 (11.90) | 11.89 |
| 26. | $T_{26}$-IS-319-B | 23.00 (28.65) | 21.00 (27.27) | 12.83 (20.99) | 18.94 |
| 27. | $T_{27}$ - IS-526-2-84-B | 27.60 (31.69) | 23.00 (28.64) | 11.47 (19.78) | 20.69 |
| 28. | $T_{28}$ - KIS-306 | 20.30 (28.30) | 22.00 (27.97) | 14.33 (22.23) | 18.88 |
| 29. | $T_{29}$ - KMR-48-A | 25.00 (26.78) | 22.00 (27.97) | 12.50 (20.69) | 19.83 |
| 30. | $T_{30}$ - KMR-49 | 29.25 (32.74) | 23.50 (28.99) | 14.00 (21.97) | 22.25 |
| 31. | $T_{31}$ -KMR-53 | 9.33 (17.84) | 11.00 (19.36) | 7.38 (15.75) | 9.24 |
| 32. | $T_{32}$ - KMR- 74 | 21.00 (27.27) | 21.52 (27.63) | 14.69 (22.53) | 19.07 |
| 33. | $T_{33}$ - KMR-79-B | 14.69 (22.53) | 12.30 (20.53) | 7.63 (15.99) | 11.54 |
| 34. | $T_{34}$ - KMR-83-A | 17.46 (24.69) | 12.43 (20.64) | 6.33 (14.57) | 12.07 |
| 35. | $T_{35}$ -NAL/78/3041431/2 | 15.59 (23.26) | 18.17 (25.23) | 7.23 (15.59) | 13.66 |
| 36. | $T_{36}$ - NIC-7935 | 15.14 (22.89) | 17.67 (24.84) | 9.81 (18.25) | 14.21 |
| 37. | $T_{37}$ - NIC-8164 | 17.37 (24.62) | 19.33 (26.07) | 6.85 (15.17) | 14.52 |
| 38. | $T_{38}$ - NIC-8368 | 9.55 (17.99) | 9.43 (17.87) | 4.65 (12.45) | 7.88 |
| 39. | $T_{39}$ - NIC-8463 | 29.41 (32.84) | 22.40 (28.25) | 11.17 (19.51) | 20.99 |
| 40. | $T_{40}$ - NIC-8473 | 9.80 (18.24) | 9.10 (17.55) | 4.10 (11.68) | 7.67 |
| 41. | $T_{41}$ - NIC-8502 | 13.85 (21.85) | 14.92 (22.71) | 10.83 (19.21) | 13.20 |

| S. No. | Genotypes | Percent damages due to leaf webber and capsule borer at different phonological stages of plant growth | | | |
|---|---|---|---|---|---|
| | | Plant damage (30 DAS) | Flower damage (45 DAS) | Capsule damage (70 DAS) | Mean damage |
| 42. | $T_{42}$ - NIC-16248 | 21.33 (27.51) | 23.30 (28.86) | 13.30 (21.37) | 19.31 |
| 43. | $T_{43}$ - NIC-16256 | 13.15 (21.26) | 11.97 (20.23) | 5.30 (13.30) | 10.14 |
| 44. | $T_{44}$ -NIC-17452 | 12.99 (21.11) | 13.22 (21.31) | 9.17 (17.61) | 11.79 |
| 45. | $T_{45}$ -NIC-17930 | 12.48 (20.67) | 14.17 (22.11) | 6.03 (14.19) | 10.89 |
| 46. | $T_{46}$ - NIC-16227-A | 14.33 (22.24) | 19.48 (26.19) | 6.97 (15.30) | 13.59 |
| 47 | $T_{47}$ - NIC-16387-A | 14.97 (22.76) | 15.33 (23.05) | 5.63 (13.71) | 11.98 |
| 48. | $T_{48}$ - NIC-8224-A | 9.67 (18.11) | 9.00 (17.44) | 4.67 (12.42) | 7.78 |
| 49. | $T_{49}$ - NIC-8423-B | 25.16 (30.11) | 22.67 (28.42) | 14.33 (22.23) | 20.72 |
| 50. | $T_{50}$ - NIC-B-240-A | 8.88 (17.34) | 9.25 (17.70) | 4.33 (12.00) | 7.49 |
| 51. | $T_{51}$ - RJS-146-1-84 | 19.88 (26.48) | 12.17 (20.41) | 7.67 (15.99) | 13.24 |
| 52. | $T_{52}$ - RJS-147-1-84-B | 17.98 (25.09) | 11.67 (19.96) | 4.99 (12.91) | 11.55 |
| 53. | $T_{53}$ - S-0271 | 33.33 (35.26) | 31.55 (34.17) | 16.17 (23.70) | 27.02 |
| 54. | $T_{54}$ - S-0292 | 11.14 (19.50) | 14.28 (22.20) | 7.48 (15.86) | 10.97 |
| 55. | $T_{55}$ - S-0301 | 18.67 (25.59) | 29.97 (33.19) | 15.00 (22.78) | 21.21 |
| 56. | $T_{56}$ - S-0314 | 21.85 (27.87) | 27.63 (31.71) | 12.67 (20.85) | 20.72 |
| 57. | $T_{57}$ - S-0351 | 9.66 (18.10) | 9.33 (17.78) | 4.48 (12.21) | 7.82 |
| 58. | $T_{58}$ - S-0484 | 27.13 (31.39) | 25.60 (30.39) | 17.67 (24.85) | 23.47 |
| 59. | $T_{59}$ - S-0644 | 8.87 (17.31) | 9.29 (17.73) | 4.28 (11.94) | 7.48 |
| 60. | $T_{60}$ - SI-3257 | 15.26 (22.99) | 15.00 (22.78) | 7.33 (15.66) | 12.53 |
| 61. | $T_{61}$ - SI-3274 | 22.50 (28.31) | 23.84 (29.22) | 16.29 (23.80) | 20.88 |
| 62. | $T_{62}$ - SI-3100 | 33.80 (35.55) | 34.17 (35.77) | 19.19 (25.96) | 29.05 |

| S. No. | Genotypes | Percent damages due to leaf webber and capsule borer at different phonological stages of plant growth | | | |
|---|---|---|---|---|---|
| | | Plant damage (30 DAS) | Flower damage (45 DAS) | Capsule damage (70 DAS) | Mean damage |
| 63. | $T_{63}$ - SI-1004-B | 8.57 (17.01) | 11.27 (19.60) | 4.33 (11.96) | 8.06 |
| 64. | $T_{64}$ - SI-3315-6-1 | 9.85 (18.29) | 11.17 (19.51) | 4.82 (12.68) | 8.61 |
| 65. | $T_{65}$ - SI-7817-B | 27.09 (31.36) | 23.29 (28.85) | 13.80 (21.80) | 21.39 |
| 66. | $T_{66}$ - TC-30 | 28.16 (32.05) | 29.75 (33.05) | 15.43 (23.12) | 24.45 |
| 67. | $T_{67}$ - VCR/81/NO/80/NS/972 | 8.56 (16.98) | 9.50 (17.95) | 4.83 (12.69) | 7.63 |
| 68. | $T_{68}$ - SI- 250 RC | 7.67 (16.05) | 8.33 (16.74) | 4.00 (11.48) | 6.67 |
| 69. | $T_{69}$ - TC-25 SC | 33.97 (35.63) | 42.00 (40.40) | 20.33 (26.80) | 32.10 |
| 70. | $T_{70}$ - JTS-8 | 32.49 (34.75) | 36.00 (36.87) | 16.45 (23.93) | 28.31 |
| 71. | $T_{71}$ -TKG-21 | 14.52 (22.39) | 14.50 (22.37) | 7.00 (15.32) | 12.01 |
| 72. | $T_{72}$ -TKG-22 | 13.00 (21.12) | 16.67 (24.08) | 8.00 (16.30) | 12.56 |
| 73. | $T_{73}$ -TKG-306 | 9.26 (17.71) | 8.63 (17.08) | 4.55 (12.16) | 7.48 |
| 74. | $T_{74}$ - TKG-308 | 13.44 (21.50) | 14.52 (22.39) | 8.09 (16.52) | 12.02 |
| 75. | T75 –Prachi | 43.52 (41.28) | 43.33 (41.17) | 23.25 (28.82) | 36.70 |
| **Mean** | | **19.14** | **18.97** | **9.94** | **16.02** |
| **SEm±** | | **0.56** | **0.46** | **0.59** | **0.54** |
| **CD (p=0.05)** | | **1.56** | **1.29** | **1.65** | **1.50** |

*Figures within parentheses are arcsine transformed values

**Table 2: Classification of genotypes on the basis of per cent plant damage by leaf webber and capsule borer (*A. catalaunalis*).**

| Sl. No. | Plant damage (%) | Reactions | Number of genotypes | Name of genotypes |
|---|---|---|---|---|
| **1.** | **No damage** | **Immune** | **0** | --------------------------- |
| **2.** | **<10** | **Resistance** | **16** | SI- 250, BM-59, 75-120, S-0644, VCR/81/NO/80/ NS/972, IC-1025-A, SI-1004-B, TKG-306, S-0351, NIC-8473, NIC-8224-A, NIC-B-240-A, SI-3315-6-1,NIC-8368 KMR-53 |
| **3.** | **10-20** | **Moderately resistance** | **31** | ES-47, TKG-22, EC-303441-BS-0292 ,NIC-17452, IS-3131, TKG-308, NIC-17930,EC-303304 ,NIC-8502, NIC-16387-A, SI-3257,TKG-21,NIC-16227-A, S-0301,NIC-16256, KMR-79-B,IS-265-B, IS-3051 , NAL/78/3041431/2, IS-245, NIC-7935, ES-52-1-84, NIC-8164, EC-334976, RJS-146-1-84 ,KMR-83-A, RJS-147-1-84-B, GRT-839-A, IC-204550, GRT-8330 -B , KIS-306 |
| **4.** | **21-30** | **Moderately Susceptible** | **21** | KMR- 74,NIC-16248,SI-3274, IS-1672, IS-294, IC-132186-A, IS -319-B, S-0314 ,KMR-48-A , GRT-8245, IS-526-2-84-B, NIC-8423-B ,IS-722-1, S-0484 ,TC-30, SI-7817-B, IC-131943,KMR-49, IC-204832-A, NIC-8463, S-0271 |
| **5.** | **31-50** | **Susceptible** | **8** | SI-3100, TC-25, JTS-8, ES-,334974, EC-334981-A, IC-204200, , ,Prachi |
| **6.** | **>50** | **Highly susceptible** | **0** | ------------------------- |

**Table 3: Classification of genotypes on the basis of per cent flower damage by leaf webber and capsule borer (*A. catalaunalis*).**

| S. No. | Plant damage (%) | Reactions | Number of genotypes | Name of genotypes |
|---|---|---|---|---|
| **1.** | **No damage** | **Immune** | **0** | --------------------------- |
| **2.** | **<10** | **Resistance** | **13** | SI- 250, BM-59 , S-0351, NIC-8473, NIC-8368,VCR/81/NO/80/NS/972, IC-1025-A, 75-120 NIC-B-240-A,S-0644, TKG-306, , NIC-8224-A,KMR-53 |
| **3.** | **10-20** | **Moderately resistance** | **32** | SI-1004- B, NIC-16256, KMR-79-B, RJS-146-1-84, SI- 3315-6, ES-47, EC-303441-B,EC-303304,NIC-17452, RJS-147-1-84-B, NIC-17930, S-0292, IS-1672, NIC-8502, TKG-308, IS-3131, GRT-8330-B, TKG-22, NIC-16387-A, IS-3051, KMR-83-A, NIC-16227-A, ES-52-1-84, SI-3257, GRT-839-A,TKG-21,IS-265-B, NAL/78/3041431/2 , IS-245, NIC-8164, EC-334976, NIC-7935 |
| **4.** | **21-30** | **Moderately Susceptible** | **23** | IS-319-B ,KMR-48-A, IC-131943,IS-204550, GRT-8245 ,IS-294, NIC-8423-B, KIS-306, NIC-8463, IS-526-2-84-B, KMR-74,KMR-49, SI-3274,SI-7817-B, NIC-16248, S-0484, IS-722-1 ,IC-204200,S-0314,IC- 204832-A, IC-132186-A TC-30, S-0301 |
| **5.** | **31-50** | **susceptible** | **07** | SI-3100, JTS-8, S-0271, EC-334981-A,TC-25, ES-334974, Prachi |
| **6.** | **>50** | **Highly susceptible** | **00** | ----- -------------------- |

**Table 4: Classification of genotypes on the basis of per cent capsule damage by leaf webber and capsule borer (*A. catalaunalis*) at capsule stage.**

| S. No. | Plant damage (%) | Reactions | Number of Genotypes | Name of genotypes |
|---|---|---|---|---|
| **1.** | **No damage** | **Immune** | **0** | ----------------------------- |
| **2.** | **<5** | **Resistance** | **19** | SI- 250, NIC-8368, NIC-8473,S-0644, 75-120, S-0644, IS-265-B, NIC-B-240-A, SI-1004-B,S-0351, SI-3315-6-1, BM-59, IS-3051, TKG-306, NIC-8224-A, IC-1025-A, RJS-147-1-84-B,VCR/81/NO /80/NS/972, ES-47 |
| **3.** | **5-10** | **Moderately resistance** | **25** | NIC-8164, NIC-16256, NIC-16227-A,IS-3131, SI-3257,TKG-21, NIC-16387-A, KMR-79-B NIC-17930, EC-303441-B , IS-245, S-0292,TKG-22 ,KMR-83-A, NAL/78/3041431/2 ,RJS-146-1-84 , GRT-839-A, TKG-308, GRT-8330 -B,IS-1672, NIC-7935 EC-334976,NIC-17452,IC-204550 |
| **4.** | **11-15** | **Moderately Susceptible** | **21** | ES-52-1-84 ,IS-294, S-0314, IS-526-2-84-B, NIC-8502, IS-319-B KMR-48-A, GRT-8245, EC-303304 ,KIS-306 , IC-204832-A, KMR-49, NIC-8423-B, SI-7817-B, S-0301, NIC-16248, IC-132186-A ,KMR- 74, IS-722-1,TC-30, IC-131943 |
| **5.** | **16-25** | **susceptible** | **10** | IC-204200, JTS-8, S-0484, SI-3100, SI-3274, S-0271, TC-25, EC-334981-A, ES-334974, Prachi |
| **6.** | **>25** | **Highly susceptible** | **0** | ---------------------- |