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# FIELD SCREENING OF CHICKPEA GERMPLASMS AGAINST POD BORER, *HELICOVERPA ARMIGERA* (HUBNER)

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## ABSTRACT

**Among the fifteen genotypes/cultivars of chickpea screened against *H. armigera*, BG-372, HC-1, SAKI-9516, Vijay and Avrodhi were found comparatively less susceptible as they harboured lower larval population (1.07 to 1.32 larvae/plant), also had lower damage to pods (11.41 to 14.16%) and higher grain yield (1375 kg/ha to 1187 kg/ha) than remaining cultivars. Further, the cultivars, Dahod Yellow and BG-256 were also less susceptible and gave good grain yield even though having high larval population (2.52 and 2.47 larvae/plant) and high pod damage (22.81 and 20.49%).**

**Key words:** *Helicoverpa armigera* (Hubner), chickpea, cultivar, Pod borer

Chickpea (*Cicer arietinum* L.) is one of the important pulse crops cultivated in Indian farming of arid and semi-arid tropics. In India, area under chickpea was 7.58 million ha with a production of 5.91 million tonnes with average productivity of 780 kg/ha (Singh, 2008), while in Gujarat, area under chickpea was 1.97 lakh ha with total production of 1.872 lakh tonnes and productivity of 950 kg/ha during *rabi* 2007-08 (Anonymous, 2008a). The low yield of chickpea is attributed to the regular outbreaks of pod borer, *Helicoverpa armigera* (Hubner) which is considered to be one of the major pests of chickpea crop. The pest feeds voraciously from seedling stage to maturity and causes about 38 per cent damage to the chickpea pods (Singh *et al* 2008). A preliminary survey around Junagadh (Gujarat) revealed that the gram pod borer has been the major and potential threat to the gainful productivity of chickpea. The information on chickpea resistance to this pest particularly under Junagadh condition is meager and hence, the present investigation was carried out.

Fifteen promising genotypes *viz.,* GG-1, GG-2, Dahod Yellow, KAK-2, ICCV-4, Vijay, HC-3 Virat, Vishal, SAKI-9516, Avrodhi, BG-256, BG-372, Digvijay and HC-1 were grown in plot of five meter length (two rows) with 45 cm ×10 cm spacing and replicated twice in randomized block design. All the recommended agronomical practices were adopted for raising the crop. For recording the observations, five plants were randomly selected and tagged from each cultivars/ genotypes. The observations on number of larvae per plant were recorded starting from flowering to maturity stage of the crop at an interval of 15 days. The data on per cent pod damage by *H. armigera* was recorded at harvest. Yield of chickpea lines were recorded from net plot area in each entry.

None of the genotypes was found free from the incidence of gram pod borer, *H. armigera* (Table 1). However, BG-372, HC-1, SAKI-9516, Vijay and Avrodhi were found resistant to this pest with 1.07, 1.17, 1.22, 1.27 and 1.32 larvae per plant, respectively than remaining cultivars except Digvijay. HC-3 was found the most susceptible with 3.58 larvae per plant. Further, cultivars Virat, KAK-2 and GG-2 were also found the most susceptible as they registered 3.32, 3.45 and 3.50 mean larvae per plant, respectively and were at par with HC-3. The remaining genotypes/cultivars *viz.*, Digvijay, BG-256, Dahod Yellow, ICCV-4, Vishal and GG-1 were found moderately susceptible.

Genotypes BG-372, HC-1, SAKI-9516, Vijay and Avrodhi recorded significantly low pod damage due to *H. armigera* (11.41, 12.35, 12.80, 13.48 and 14.16% pod damage, respectively) than

**Table 1:** Mean number of larvae per plant, per cent pod damage and grain yield of chickpea on different genotypes/ cultivars during *rabi*, 2008-09.

| Genotypes/cultivars | Mean no. of *H. armigera* larvae/plant | Mean per cent damaged pods/plant | Yield(kg/ha) |
|---|---|---|---|
| GG-1 | 1.8**(2.8) | 31.5* (27.3) | 880 |
| GG-2 | 2.0 (3.5) | 35.2 (33.2) | 587 |
| Dahod Yellow | 1.7 (2.5) | 28.5 (22.8) | 1290 |
| KAK-2 | 2.0 (3.5) | 34.0 (31.3) | 657 |
| ICCV-4 | 1.8 (2.6) | 30.2 (25.3) | 930 |
| Vijay | 1.3 (1.3) | 21.5 (13.5) | 1195 |
| HC-3 | 2.0 (3.6) | 36.3 (35.1) | 560 |
| Virat | 2.0 (3.3) | 33.6 (30.7) | 675 |
| Vishal | 1.8 (2.7) | 30.8 (26.2) | 915 |
| SAKI-9516 | 1.3 (1.2) | 21.0 (12.8) | 1220 |
| Avrodhi | 1.4 (1.3) | 22.1 (14.2) | 1187 |
| BG-256 | 1.7 (2.5) | 26.9 (20.5) | 1200 |
| BG-372 | 1.3 (1.1) | 19.7 (11.4) | 1375 |
| Digvijay | 1.6 (2.2) | 29.6 (24.5) | 980 |
| HC-1 | 1.3 (1.2) | 20.6 (12.4) | 1315 |
| S.Em.± | 0.10 | 1.62 | 64.82 |
| C. D. at 5% | 0.30 | 4.92 | 196.65 |
| C. V. % | 8.35 | 8.16 | 9.19 |

*Square root transformation. **Arcsine transformed values. Figures in parenthesis are retransformed value.

other genotypes expect BG-256 (20.49%) which was at par with BG-372. Genotype HC-3 with 35.11% damaged pods was found highly susceptible. The cultivars *viz.*, Virat, KAK-2 and GG-2 had recorded 30.70, 31.34 and 33.21 per cent pod damage respectively, which were at par with HC-3.

Genotype BG-372 recorded significantly the highest grain yield (1375 kg/ha) which was at par with HC-1, Dahod Yellow, SAKI-9516, BG-256, Vijay and Avrodhi (Table 1). The lowest grain yield was recorded in the genotype HC-3 (560 kg/ha). The cultivars *viz.*, Virat (675 kg/ha), KAK-2 (657 kg/ ha), GG-2 (587 kg/ha) and HC-3 (560 kg/ha) had recorded lower yield than remaining genotypes/ cultivars. The remaining genotypes/cultivars *viz.*, Digvijay (980 kg/ha), ICCV-4 (930 kg/ha), Vishal (915 kg/ha) and GG-1 (880 kg/ha) were recorded medium grain yield and they were at par with each other.

Bhalani *et al.* (1987), Dalsania (1988) and Anonymous, (2008b) observed that chickpea genotype Dahod Yellow gave good yield despite considerable *H. armigera* damage to pods at Junagadh. Chickpea variety BG-372 recorded lower damage to pods by *H. armigera* and gave higher grain yields at Sehore, whereas KAK-2 was found susceptible (Anonymous, 2007). Thus, present findings are generally in agreement with the results reported by earlier workers.

It can be concluded that out of 15 genotypes/ cultivars of chickpea screened against *H. armigera*, none was found completely free from infestation of the gram pod borer. However, BG-372, HC-1, SAKI-9516, Vijay and Avrodhi were found moderately resistant as they harboured lower larval population (1.07 to 1.32 larvae/plant), also had lower damage to pods (11.41 to 14.16%) and higher grain yield (1375 kg/ha to 1187 kg/ha) than remaining cultivars.

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