Evaluation of sunflower germplasm for resistance against leafhopper, *Amrasca biguttula biguttula* (Ishida)

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ABSTRACT

Sixty accessions of sunflower were screened under natural infestation in *rabi*, 2017-18 for their reaction to leafhopper (*Amrasca biguttula biguttula* Ishida). Out of 60 germplasm lines screened, 42 lines were recorded the lowest injury grading of I. Two accessions GMU-339 and TSG-349 were found promising with the lowest leafhopper population and the lowest injury grade of I.

Keywords: Leafhopper, Plant resistance, Screening, Sunflower

Sunflower (*Helianthus annuus* L.) is an important edible oilseed crop grown in India. Leafhopper, *Amrasca biguttula biguttula* is the major sucking pest that predominantly occur during *rabi*/summer seasons. Both nymphs and adults suck sap from the lower surface of leaves and cause yellowing and hopper burn symptoms. Yield loss up to 40-50% was recorded due to leafhopper damage (Anonymous, 1997). Host plant resistance offers a better protection to crop from leafhoppers in an environmentally safer way than the conventional chemical control. Identifying resistant sources from available germplasm is an essential step in developing resistant cultivars. Therefore, present study was carried out to identify the sources of resistance in sunflower against leafhoppers.

A total of 60 accessions of sunflower including a susceptible check, Morden were evaluated in *rabi*, 2017-18 under natural infestation at IIOR, Hyderabad. Each accession was sown in single row of 3m length with a spacing of 60 x 30 cm and was replicated twice. Susceptible check, morden was repeatedly sown after every 10 entries. Okra (*Abelmoschus esculentus*) was sown in one row as an infester crop for leafhopper after every two rows of sunflower entries. One row of the susceptible check was also maintained around the experimental field as infester crop.

Leafhoppers (both nymphs and adults) were counted from top, middle and lower leaves from 5 randomly selected plants in each replication, from 30 days after sowing. During flowering stage, when leafhopper damage was higher, injury grading was given to 5 randomly selected plants in each replication. Injury grading was based on a 1-5 scale: 0-10 per cent yellowing or hopper burn of foliage (I), 11-20 per cent yellowing or hopper burn of foliage (II), 21-30 per cent yellowing or hopper burn of foliage (III), 31-50 per cent yellowing or hopper burn of foliage (IV) and above 50 per cent yellowing or hopper burn of foliage (V).

Mean number of leafhopper nymphs per plant ranged from 0.4 (TSG-349) to 19.8 (Morden). The lowest number of leafhopper nymphs were observed in two accessions TSG-349 (0.4/six leaves/plant) and GMU-339 (0.7/six leaves/plant). Based on the intensity of yellowing and hopper burn symptoms, the sunflower accessions were graded into resistant/susceptibility classes (Table 1). Out of 60 lines screened 42 lines were found highly resistant with an injury grade of I (less than 10 per cent yellowing), 11 lines were resistant with an injury rating of II. Four lines were categorized into scale III. One accession (PSERM-139) was susceptible with an injury grading of IV. Susceptible check, Morden and GMU-4 were highly susceptible with an injury grade of V. These reactions need to be confirmed with further experimentation.

REFERENCE

Anonymous 1997. *Annual Progress Report of AICRP on Oilseeds (Sunflower)*, Directorate of Oilseeds Research, ICAR, Hyderabad, India, pp. 167.

Table 1 Rating of sunflower accessions for leafhopper resistance based on per cent yellowing of leaves (2017-18)

Resistance rating	Name of the accessions
I (HR)	TSG-349, GMU-339, TSG-278, GP9472-4-13, GP6-570, TSG-287, TSG-298, TSG-320, TSG-400, TSG-258, TSG-HA89-B, TSG-297, TSG-197, PSERM-138, GMU-669, TSG-HA-430-B, TSG-217, TSG-195, AKSFI-46-2, PSCIM-117, TSG-216, GMU-504, TSG-238, PSMO-53-D, PSECO-86, GMU-696, GMU-776, GMU-1029, TSG-196, TSG-198, TSG-296, TSG-302, TSG-337, TSG-338, TSG-339, TSG-401, PSECO-70, OCRM, GMU-556, TSG-295, PSECO-79, PSECO-81
II (R)	PSCIM-115, PSCIM-122, GMU-595, GMU-922, PSCIM137, GMU-327, GMU-343, GMU-713, Syngenta-275, PSCIM-186, PSCIM-127
III (MR)	GMU-405, GMU-25, GMU-243, PSMO-53-B-1
IV (S)	PSERM-139
V (HS)	Morden, GMU-4