

VARIETAL SUSCEPTIBILITY AGAINST PEST COMPLEX OF SOYBEAN

*CHEJARA, L. K. AND KHANPARA, A. V.

DEPARTMENT OF ENTOMOLOGY
COLLEGE OF AGRICULTURE
JUNAGADH AGRICULTURAL UNIVERSITY
JUNAGADH – 362 01, GUJARAT, INDIA

*[EMAIL: sikarraaj@gmail.com](mailto:sikarraaj@gmail.com)

ABSTRACT

Investigation was carried out on varietal susceptibility against pest complex of soybean [Glycine max (L.) Merrill.] at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh (Gujarat) during the kharif -2013. Studies on susceptibility of eight genotypes/ varieties of soybean against pest complex revealed that the genotype GS3 recorded lowest population of whitefly (2.75 whiteflies per three leaves per plant) and aphid (2.13 aphid index per plant). The genotype J659 recorded minimum population of jassid (2.91 jassid per three leaves per plant) and S. litura (2.63 larvae per plant).

KEY WORDS: *Aphid, jassid, soybean, susceptibility, whitefly*

INTRODUCTION

Soybean [*Glycine max* (L.) Merrill.] is an important leguminous crop. Native of soybean is in Asia and the first known records, however, indicated that soybean emerged as a domesticated crop around the eleventh century B.C. in China (Hymowitz, 1970), where it was cultivated for its oil since centuries and they named it as a “yellow jewel” which feeds china’s entire population. From nutritional point of view, soybean contains 43.20 per cent protein and 20.00 per cent of edible oil. Soybean is a good source of phosphorus and lecithin. It also contains good amount of potassium, sulphur and Vitamin E. Soybean protein is mainly rich in amino acids like leucine, methionine and threonine that the human body requires. For vegetarians, it is known as “poor man’s meat”. Owing to the absence of sugar content, it is considered to be very

suitable diet for diabetic patients. These characteristics have made soybean to fit well in sustainable agriculture. During the late sixties and early seventies, the soybean crop was considered to be comparatively safe crop with regards to insect pest attack. According to Bhattacharya and Rathore (1979), 60 to 100 species of insects are found to attack the soybean at various stages in Uttar Pradesh. Mundhe (1980) reported about 16 insect species on soybean crop in Maharashtra. Sucking pests viz., white fly, jassid, aphid and foliage feeders leaf eating caterpillar are the major insect pests of soybean in Gujarat state.

MATERIALS AND METHODS

Eight varieties/genotypes of soybean were grown in plot of three meter length with six rows each with 45 cm x 15 cm spacing and replicated thrice in randomized block design. For recording the observations, five plants

were selected randomly of each variety from each quadrat (1 m x 1 m) and tagged. The observations were recorded by examining the plant thoroughly at weekly interval from the first week after sowing till harvest of the crop. Observations of sucking pests, viz. whitefly and jassid were recorded at weekly interval by observing three leaves (upper, middle and lower) of each five tagged plant per plot. Observations on aphid were recorded by counting aphid index per plant. To record the observations of foliage on five plants per plot were selected randomly and tagged. Numbers of larvae of foliage feeders were recorded on the five tagged plant per plot at weekly interval and continued upto harvest. Mean population of larvae per plant *S. litura* were worked out separately.

RESULTS AND DISCUSSION

In the present investigation, it was observed that none of genotypes/ varieties was found free from attack of insect pests. However, among all genotypes/ varieties of soybean, significantly lower population was found genotype GS3 (2.75 whiteflies per three leaves per plant), which was at par with J645 and PK746 (2.94 and 2.97 whiteflies per three leaves per plant). The highest population was found on genotype AGS112 (4.16 whiteflies per three leaves per plant), which was at par with GS2 and AGS107 (3.94 and 3.73 whiteflies per three leaves per plant). The genotypes/ varieties viz., GS1 and J659 recorded 3.24 and 3.37 whiteflies per three leaves per plant, respectively and can be considered as moderately susceptible. Genotype J659 recorded minimum population of jassid (2.91 jassid per three leaves per plant), which was at par with J645, GS2, and GS3 (2.96, 3.09 and 3.14 jassid per three leaves per plant, respectively)

considered as the least susceptible. The highest population was found on genotype AGS107 (4.05 jassid per three leaves per plant) which was at par with GS1, PK746 and AGS112 (3.99, 3.97 and 3.72 jassid per three leaves per plant, respectively) can be considered as the highly susceptible (Table 1 and Figure 1). Research conducted earlier by Gaur and Deshpande, (1998) for the relative susceptibility of promising soybean cultivars NRC12, JS71-05, PK564, NRC 7, JS 355, PUSA 16 and NRC 8 found that NRC 7 was tolerant to the infestation of jassid and whitefly. Sridhar *et al.*, (2003) evaluated 30 soybean lines for resistance to stem fly and whitefly and found that MACS 57 was promising against stem fly attack, whereas DS 1016 was consistently found a promising source of resistant to whitefly attack. While studying the relative resistance of soybean cultivars against sucking insect pests, Khanzada *et al.*, (2013) observed that there was a significant difference in infestation of cultivars by the sucking insect pests. The population of whiteflies and thrips were more abundant during early growth stage, while jassids were more abundant during advanced growth stage of crop. As far as cultivars are concerned, Wales-2, Braggs and AGS-109 were comparatively susceptible, while PR-142 and AGS-9 were comparatively resistant, however, rest were moderately resistant.

The genotype GS3 recorded lower incidence of aphid (2.13 aphid index per plant) which was at par with PK746, J645 and GS2 (2.33, 2.45 and 2.47 aphid index per plant, respectively) and can be considered as the least susceptible. The highest incidence was recorded in genotypes AGS112 (3.57 aphid index per plant) which was at par with AGS107 and

J659 (3.42 and 3.18 aphid index per plant) and can be considered as the highly susceptible. The genotype/ variety GS1 recorded 2.92 aphid index per plant, respectively and can be considered as the moderately susceptible (Table 1, Figure 2). Genotype J659 recorded lowest population of *S. litura* (2.63 larvae per plant), which was at par with GS3 (2.98 larvae per plant) and J645 (3.13 larvae per plant) can be considered as the least susceptible. The highest population was found on the genotype AGS 112 (3.89 larvae per plant), which was at par with PK746, GS2 and AGS107 (3.82, 3.75 and 3.57 larvae per plant, respectively) can be considered as highly susceptible. The genotype GS1 (3.29 larvae per plant) can be considered as the moderately susceptible (Table1, Figure 3).

CONCLUSION

From the present findings, it can be concluded that none of genotypes/ varieties of soybean tested was found free from attack of insect pests. The genotype GS3 recorded lowest population of whitefly (2.75 whiteflies per three leaves per plant) and aphid (2.13 aphid index per plant). The genotype J659 recorded minimum population of jassid (2.91 jassid per three leaves per plant) and *S. litura* (2.63 larvae per plant) and can be considered as the least susceptible.

REFERENCES

Bhattacharya, A. K. and Rathore, Y. S. (1979). Soybean Insect Problem in India. pp. 291-303.

- In: *Proceeding of World Soybean Research Conference-II* (Ed. Cobin, C. T.), March 26-29, 1979, North Carolina State University, Raleigh, U. S. A., [Fide: R. A. E.(A), **69**(9): 665].
- Gaur, S.K. and Deshpande, R.R. (1998). Relative susceptibility of soybean *Glycine max* (E) varieties to insect pests complex. *Indian J. Plant Protec.*, **26**: 186-187.
- Hymowitz, T. (1970). On the domestication of soybean. *Economic Bot.*, **24**: 408-421.
- Khanzada, S. R.; Khanzada, M. S.; Abro, G. H.; T. Syed, S.; Soomro, K.; Khanzada, A. M.; Anwar, S. and Shakeel, N. (2013) relative resistance of soybean cultivars against sucking insect pests. *Pakistan J. Sci.*, **65**(2): 197-201.
- Mundhe, D. R. (1980). Insect pest complex on soybean, *Glycine max* (L.) Merrill in Marathawada region. *J. Marathawada Agril. Univ.*, **5**(3): 259-260.
- Sridhar, Y.I.; Siddiqui, K.H. and Trimohan, K.H. (2003): Field evaluation of soybean germplasm for identifying resistance to stem fly, *Melanagromyza sojae* and whitefly, *Bemisia tabaci*. *J. Entomol.*, **65**(2): 222-227.

Table 1: Varietal susceptibility of different genotypes/ varieties against pest complex of soybean during kharif-2013

Sr. No.	Genotypes / Varieties	Mean Number of Whitefly / 3 Leaves / Plant	Mean Number of Jassid / 3 Leaves / Plant	Aphid Index / Plant	Mean Number of Tobacco Leaf Eating Caterpillar Larvae / Plant
1	GS 1	3.24	3.99	2.92	3.29
2	GS 2	3.94	3.09	2.47	3.75
3	GS 3	2.75	3.14	2.13	2.98
4	J 645	2.94	2.96	2.45	3.13
5	J 659	3.37	2.91	3.18	2.63
6	AGS 107	3.73	4.05	3.42	3.57
7	AGS 112	4.16	3.72	3.57	3.89
8	PK 746	2.97	3.97	2.33	3.82
S. Em. ±		0.15	0.19	0.17	0.19
C.D. at 5%		0.44	0.57	0.52	0.56
C.V. %		7.49	9.32	10.54	9.57

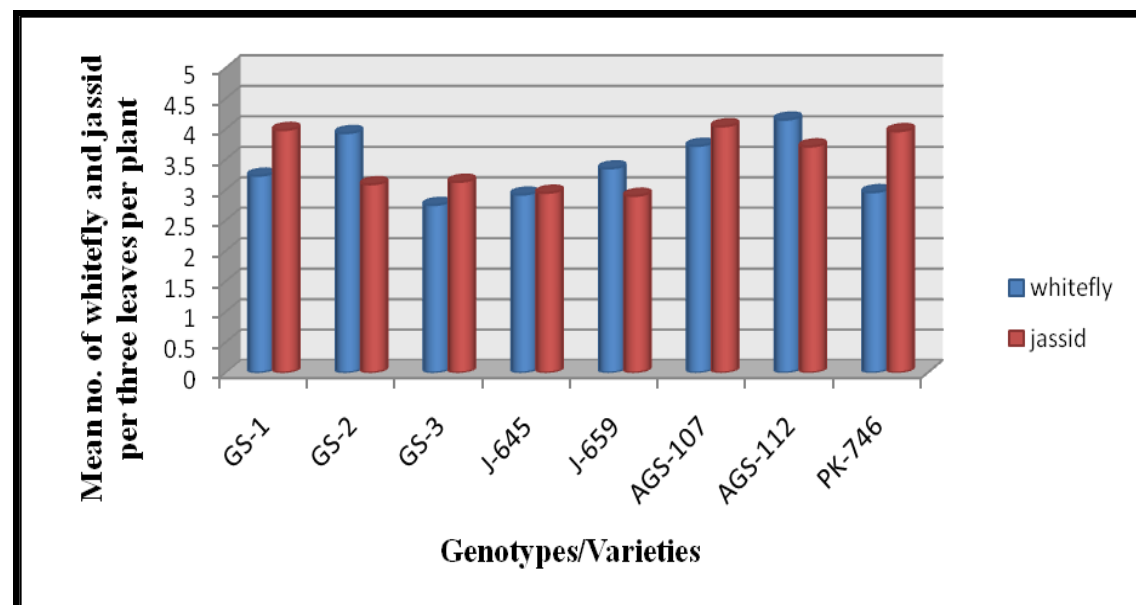


Figure 1: Mean population of whitefly, *B. tabaci* and jassid, *E. kerri* on different genotypes/varieties of soybean during kharif-2013

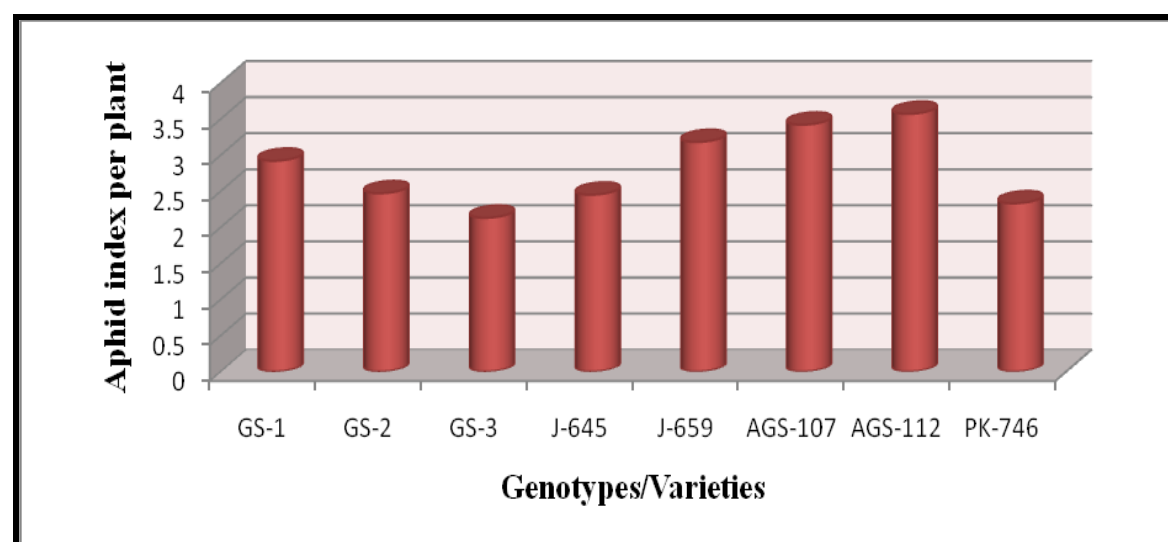


Figure 2: Mean population of aphid on different genotypes/varieties of soybean during kharif-2013

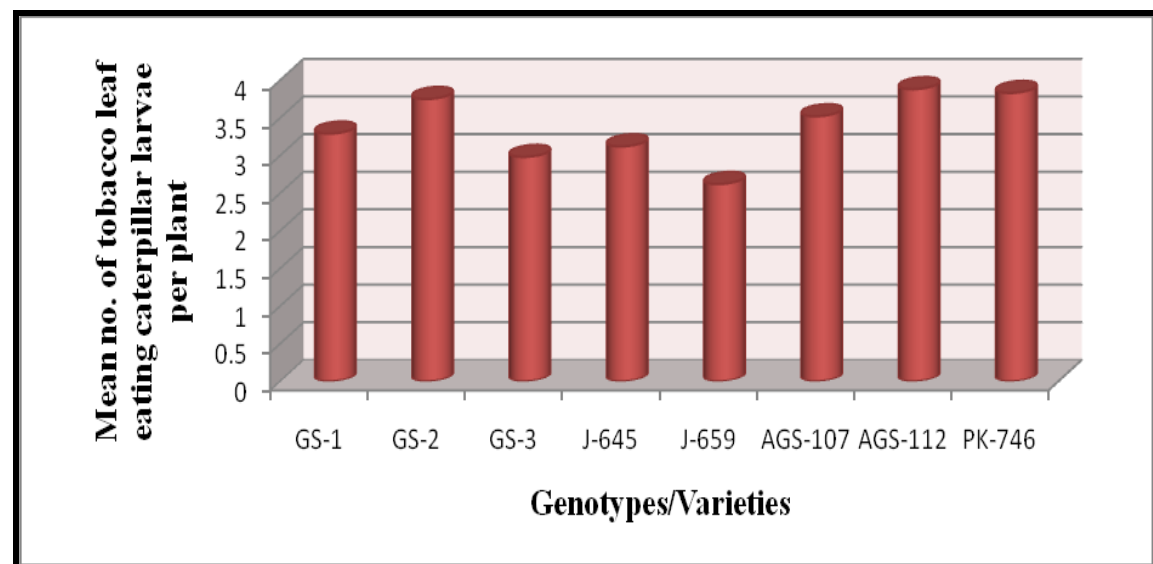


Figure 3: Mean population of tobacco leaf eating caterpillar on different genotypes/varieties of soybean during kharif-2013