NCPP 13

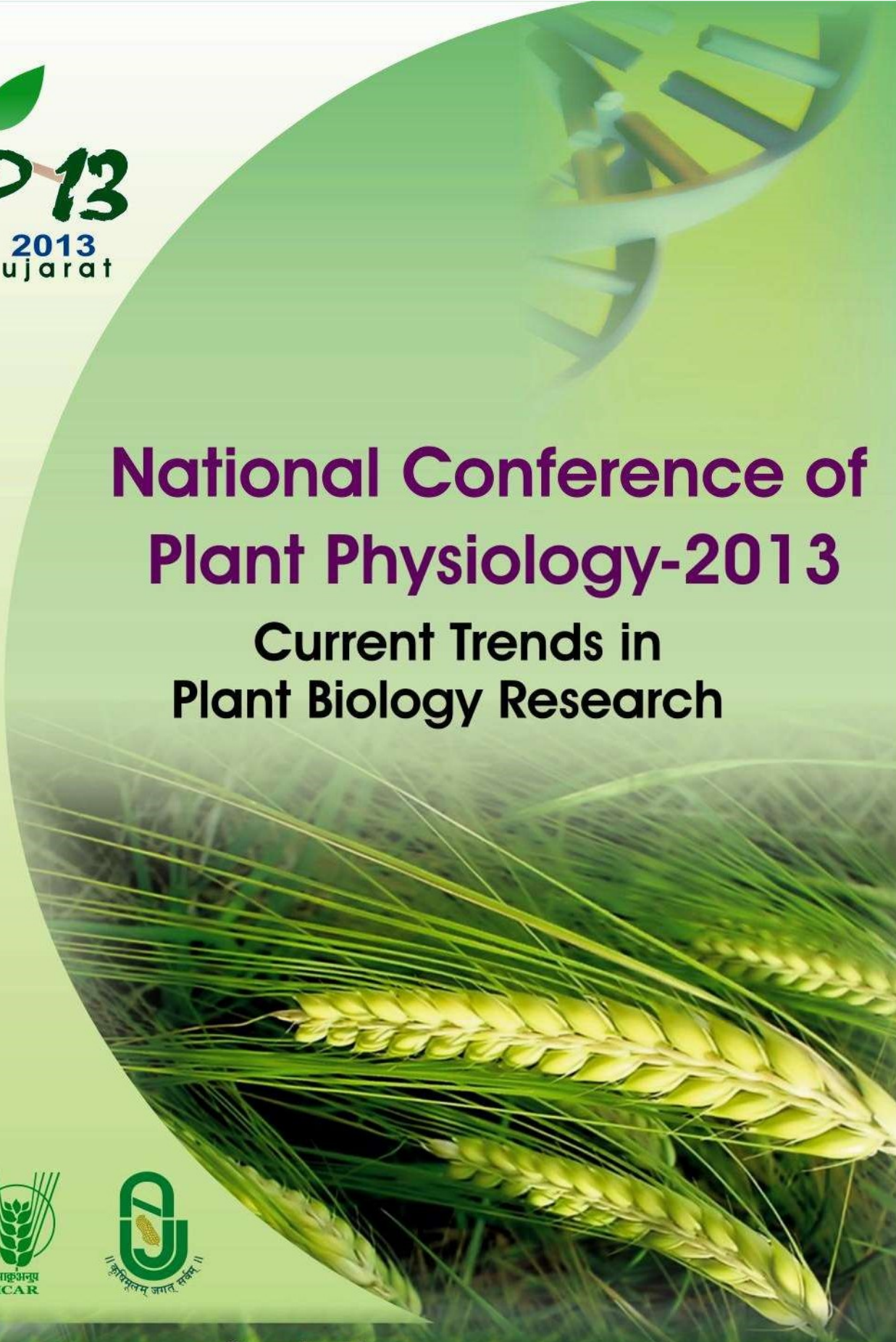
13-16 Dec 2013

Junagadh Gujarat

Proceedings

National Conference of Plant Physiology-2013

Current Trends in Plant Biology Research



Organised by

Directorate of Groundnut Research, Junagadh

&

Junagadh Agricultural University, Junagadh

In association with

Indian Society for Plant Physiology, New Delhi

P 1-58. PREFERENCE OF *SPODOPTERA LITURA* (FABRICIUS) TO DIFFERENT GROUNDNUT GENOTYPES

Meera Gajera, Poonam Jasrotia, Savaliya, S.D. and Nataraja, M.V.

Directorate of Groundnut Research, P.B. No. 5, Junagadh- 362 001. E-mail: meeragajera610@gmail.com

INTRODUCTION

The Tobacco caterpillar, *Spodoptera litura* (Fabricius) is a major pest of groundnut crop causing26–100% loss in pod yield (Dhir *et al.*, 1992). Its peak incidence (40th standard week) coincides with flowering and fruiting stages of the *kharif* sown crop (Harish *et al.*, 2012). The components of IPM like, chemical, biological and mechanical methods have limitations such as environmental safety, economic constraints and emergence of resistance in pests. Host plant resistance is the foundation for the successful IPM. The present study was undertaken to know the preference of *S. litura* to different groundnut genotypes.

METHODSAND MATERIALS

Ten groundnut genotypes (PBS-22066, PBS-22059, PBS-22064, PBS-22065, PBS-22063, PBS-22062, PBS-22074, CS-349, CS-85 and Girnar-2) along with a resistant check (BG-2), a susceptible check (GG-20) and control (semi-synthetic diet) were screened. The 3rd instar larvae of *S. litura* were obtained from the laboratory culture reared on the semi-synthetic diet. Single larvae was released into the Petri plate containing the pre-weighed leaflet from each genotype/cultivar under study and replicated thrice with completely randomized design (CRD). The leaflets were changed at every 24 hrs interval the entire set up is maintained at 25±2ºC and 75±5%. The observations were recorded on the weight leaf consumed (mg), defoliation (%) on 0-9 score and length of larval period (days). The leaf consumption values were square root transformed and statistically analyzed for ANOVA. Means were separated with the Duncan's Multiple Range Test (DMRT) using critical difference (CD) at p=0.05.

RESULTS AND DISCUSSION

The treatments means differed significantly except on 2nd and 3rd days for the leaf consumption by *S. litura* (Table 1). After first day, the average leaf consumed was minimum (118.3 mg) in genotype, PBS-22067 which was statically superior over the control (1432.0 mg) and at par with BG-2 (204.2 mg) and GG-20 (180.1 mg). Whereas on 4th day, the minimum leaf consumed (mg) was observed in the following genotype, Girnar-2 (208.8) which was statistically at par PBS-22074 (214.6), PBS-22067 (222.1), PBS-22066 (231.3), CS-85 (233.5), GG-20 (250.4) and BG-2 (331.6). All the genotypes were found statistically at par and superior to the control (29117.7 mg) however, the minimum total leaf consumption was recorded with CS-349 (2135.9 mg). The length of larval period was highest (15 days) when larvae were reared on leaves of PBS-22059 and PBS-22065 compared to BG-2 (10) and control (10). The severity of leaf defoliation was lowest (5) in genotypes, PBS-22074, PBS-22066, PBS-22065 and Girnar-2. Those genotypes which recorded minimum leaf consumption by *S. litura*, prolonged larval period and minimum defoliation rate were thought to be least preferred. The less preference in these genotypes may be attributed to the leaf thickness, leaf constituents like, pectin, wax layer etc. and the nutrient composition. The results were in agreement with the findings of Tewari *et al.* (1991).

CONCLUSION

The groundnut genotypes, PBS-22065, PBS-22066, PBS-22067 and PBS-22074 were less preferred by *S. litura* and hence may be utilized in resistance breeding programmes.

Table 1: Response of *S. litura* to different groundnut genotypes

Genotypes	Average of leaf consumed (mg) on				Total leaf consumed (mg)	Average length of larval duration (days)	Damage rate (0-9 scale)
	1st day	2nd day	3rd day	4th day			
PBS-22063	198.9 (14.0)$^{ab*\#}$	165.8 (12.9)	174.0 (12.6)	261.8 (16.2)^{ab}	2596.8 (50.9)^{a}	11	6
PBS-22062	214.4 (14.5)^{b}	244.3 (15.6)	271.8 (16.4)	366.5 (19.1)^{b}	2815.1 (53.0)^{a}	11	6
PBS-22074	158.3 (12.5)^{ab}	147.8 (12.2)	221.4 (14.8)	214.6 (14.7)^{a}	2960.8 (54.1)^{a}	11	5
PBS-22067	118.3 (10.8)^{a}	163.2 (12.7)	226.4 (15.0)	222.1 (14.9)^{a}	2334.8 (48.3)^{a}	12	7
PBS-22066	171.8 (13.0)^{ab}	187.1 (13.6)	188.2 (13.6)	231.3 (15.2)^{a}	2409.3 (49.1)^{a}	14	5
PBS-22059	185.8 (13.6)^{ab}	190.2 (13.8)	234.8 (15.2)	262.3 (16.2)^{ab}	2838.6 (53.2)^{a}	15	6
PBS-22064	164.2 (12.8)^{ab}	166.1 (12.9)	299.1 (17.2)	236.6 (15.4)^{ab}	2737.2 (52.3)^{a}	13	7
PBS-22065	148.7 (12.2)^{ab}	122.6 (11.1)	190.1 (13.7)	271.0 (16.5)^{ab}	2371.3 (48.7)^{a}	15	5
CS-349	149.2 (12.1)^{ab}	158.6 (12.6)	213.4 (14.3)	245.0 (15.5)^{ab}	2135.9 (46.1)^{a}	13	6
CS-85	233.8 (15.2)^{b}	187.3 (13.7)	252.4 (15.7)	233.5 (15.2)^{a}	2692.3 (51.9)^{a}	11	7
BG-2	204.2 (14.2)^{ab}	235.8 (15.2)	298.7 (17.0)	331.6 (18.1)^{ab}	2708.8 (52.0)^{a}	10	7
Girnar-2	157.2 (12.5)^{ab}	170.0 (13.0)	165.0 (12.8)	208.8 (14.5)^{a}	2715.8 (52.1)^{a}	14	5
GG-20	180.1 (13.2)^{ab}	157.5 (12.6)	242.3 (15.5)	250.4 (15.8)^{ab}	2827.9 (53.1)^{a}	14	6
Control	1432.0 (37.5)^{c}	136.7 (11.5)	251.3 (15.2)	1333.3 (36.3)^{c}	29117.7 (169.5)^{b}	10	-
Sem±	1.2	0.9	1.5	1.3	4.1	-	-
CD (p=0.05)	3.5	NS	NS	3.7	12.0	-	-
CV (%)	14.2	12.0	17.9	12.9	12.0	-	-

*figures within parenthesis are square root transformed values and # means within a column followed by the same letter do not differ significantly by CD at p=0.05 following DMRT

REFERENCES

Dhir BC, Mohapatra HK, Senapathi B (1992) Assessment of crop loss in groundnut due to tobacco caterpillar, *Spodopteralitura* (F.) Indian J Plant Protect 20: 215–217.

Harish G, Nataraja MV, Jasrotia P, Holajjer P, Savaliya SD, Gajera M (2012) Population dyanamics of *Spodoptera litura* and *Helicoverpa armigera* on groundnut. In International Conference on Plant Health Management for Food Security. NBPGR regional station, Hyderabad pp 103-104.

Tiwari SN, Bhattacharya AK, Rathore YS, Sachan GC (1991) Dry matter utilization of groundnut varieties by *Spodoptera litura* (Fabricius). Indian J Entomol 53: 516–517.