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SCREENING OF CERTAIN GREEN GRAM, *VIGNA RADIATA* GENOTYPES AGAINST SUCKING INSECT PESTS

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ABSTRACT

The twenty genotypes of green gram namely Pant M4, ML 2410 , VGG 15-030, KM 2349, ML 818, Pusa 1671, Pusa 1672, Pant M6, PM 11-26, SML 1811, COGG 912, RMG 1092, PM 11-25, AKM 12-24, IGKM 06.26.5, RMG 1087, VGG 10-008, IGKM 05-18-2, AKM 12-14, HUM-12 were raised under natural condition to study the population build-up of major sucking insect pests *viz., Bemisia tabaci*, *Empoasca kerri*, *Caliothrips indicus* on green gram. The results of present investigation revealed that maximum population of *B. tabaci* was recorded on the genotype ML 2410 (3.20 whitefly/split cage) followed by genotype PM 11-25 (3.07 whitefly/split cage) and minimum in genotype RMG 1087 (1.38 whitefly/split cage) followed by genotype AKM 12-24 (1.67 whitefly/split cage). The maximum jassid population was recorded on genotype VGG 15-030 (3.41 jassid/ split cage) followed by genotype ML 2410 (2.92 jassid/ split cage) and minimum on genotype AKM 12-24 (1.63 jassid/split cage) followed by genotype AKM 12-14 (1.70 jassid/ split cage). The genotype PM 11-26 (2.06 thrips/5 flowers) showed maximum infestation of thrips followed by genotype Pusa 1671 (1.94 thrips/5 flowers) and minimum in genotype VGG 15-030 (0.21 thrips / 5 flowers) followed by genotype COGG 912 (0.45thrips / 5 flowers). The maximum yield was recorded in genotype VGG 10-008 (7.67 q/ha), followed by genotype HUM 12 (7.33 q/ha) and minimum in COGG 912 (2.67 q/ha), followed by genotype VGG 15-030 (3.00 q/ha).

Figure : 00 References : 16 Tables : 04

KEY WORDS : Genotypes, Green gram, Jassid, Screening, Thrips, Whitefly.

Introduction

In India, pulses have been described as a "poor man's meat and rich man's vegetable. Pulses are important for sustainable agriculture as they improve physical, chemical and biological properties of soil. They maintain soil fertility through biological nitrogen fixation by bacteria, *Rhizobium* sp. prevalent in their root nodules. The mungbean, *Vigna radiata*, Synonyms, *Phaseolus aurius*, *Phaseolus radiatus* is one of the most important food legume and third largely grown pulse crop in India after chickpea and pigeon pea. In India, pulses are grown over on area of 25.22 million ha with a production and productivity of about 19.27 million tonnes and 764 kg/ha, respectively[1]. In India, the area under mungbean is 3.28 million ha with the production of 1.55 million tonnes having an average yield[2] of 317 kg/ha. The green gram is comparatively rich in lysine, an amino acid that is deficient in cereals but cereals are rich in methionine, cystine and cystein, the sulphur bearing amino acids. There is a many constraints in the production of green gram, among them insect pests emerged as major one. The most serious insect pests problems include the whitefly (*Bemisia tabaci*), bean thrips (*Megaleurothrips distalis*), Jassid, (*Empoasca kerri*) gram pod borer (*Helicoverpa armigera*) and legume pod borer (*Maruca vitrata*)[3,9,13]. The whitefly; *B. tabaci* is reported to infest the crop at different places in India[4,5,7,11,12,15]. These workers have also reported the indirect damage by whitefly to this by transmitting Yellow Mosaic Virus. The present experiment was carried out in view of these problems to find out best genotypes.

Materials and Methods

The experiment was carried out during the *Kharif* 2016 at Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (U.P.) to determine the incidence of insect pest on 20 promising genotypes of green gram, which were obtained from ICAR-Indian Institute of Pulse Research, Kanpur,(U.P.). The recommended agronomic practices without using pesticide were followed in growing of the crop. All the genotypes were grown in Randomized Block Design (RBD) with 3 replications. The row to row and plant to plant distance was maintained as 30 cm and 10 cm, respectively. The unit plot size was 4×0.60 m. **T**he infestation of insect pests was recorded from three randomly selected plants from each genotype and the mature and immature stages of major insect pests present

TABLE-1: Screening of certain green gram genotypes against whitefly, *Bemisia tabaci* under filed conditions during *Kharif* 2016

Genotypes	Mean Whitefly Population /split cage*			
	30 DAS	45 DAS	60 DAS	Overall Mean
Pant M4	2.00 (1.58)	1.78 (1.51)	3.00 (1.87)	2.26 (1.65)
ML 2410	2.78 (1.81)	2.89 (1.84)	3.40 (1.96)	3.20 (1.88)
VGG 15-030	2.89 (1.84)	2.90 (1.84)	3.10 (1.90)	2.96 (1.86)
KM 2349	2.80 (1.82)	2.78 (1.81)	2.33 (1.68)	2.64 (1.77)
ML 818	2.67 (1.78)	2.23 (1.65)	3.05 (1.89)	2.65 (1.77)
Pusa1671	1.00 (1.22)	1.90 (1.55)	2.34 (1.69)	1.75 (1.49)
Pusa1672	1.23 (1.32)	2.28 (1.67)	2.41 (1.71)	1.97 (1.56)
Pant M6	1.98 (1.58)	2.75 (1.80)	2.65 (1.77)	2.46 (1.72)
PM 11-26	1.35 (1.36)	1.94 (1.56)	2.26 (1.66)	1.85 (1.53)
SML 1811	2.06 (1.60)	2.02 (1.59)	2.89 (1.84)	2.33 (1.68)
COGG 912	2.46 (1.72)	2.47 (1.72)	1.99 (1.58)	2.31 (1.67)
RMG 1092	2.34 (1.69)	2.44 (1.71)	3.18 (1.92)	2.65 (1.77)
PM 11-25	2.69 (1.79)	3.31 (1.95)	3.21 (1.93)	3.07 (1.89)
AKM 12-24	1.27 (1.33)	1.79 (1.51)	1.97 (1.57)	1.67 (1.49)
IGKM 06.26.5	2.62 (1.77)	2.81 (1.82)	2.73 (1.80)	2.72 (1.79)
RMG 1087	1.44 (1.39)	0.78 (1.13)	1.94 (1.56)	1.38 (1.37)
VGG 10-008	1.90 (1.55)	1.89 (1.54)	2.53 (1.74)	2.11 (1.61)
IGKM 05-18-2	1.56 (1.43)	1.67 (1.47)	2.99 (1.87)	2.07 (1.59)
AKM 12-24	1.88 (1.54)	1.92 (1.55)	1.88 (1.54)	1.89 (1.55)
HUM 12	1.70 (1.48)	1.77(1.51)	3.07 (1.89)	2.18 (1.63)
SEm±	(0.11)	(0.12)	(0.08)	(0.10)
C.D. at 5%	(0.32)	(0.35)	(0.24)	(0.30)

*Mean of three replications, Figures in parenthesis are square root ($\sqrt{x+0.5}$) transformed values

on them were counted at 15 days intervals, starting from 30 days after sowing. The insect pests considered for investigations were whitefly, *Bemisia tabaci;* Jassid, *Empoasca kerri,* Thrips *Caliothrips indicus.* The numbers of insect pests counted from all the three replications for all the genotypes were separately averaged for each genotype. The population buildups of whitefly, Jassid were recorded by using the split cage. The Thrips population

TABLE-2 : Screening of certain green gram genotypes against Jassid, *Empoasca kerri* under filed conditions during *Kharif* 2016

Genotypes	Mean Jassid Population /split cage*			
	30 DAS	45 DAS	60 DAS	Mean
Pant M4	2.64 (1.77)	1.86 (1.54)	4.00 (2.12)	2.83 (1.83)
ML 2410	2.66 (1.78)	2.77 (1.81)	3.33 (1.96)	2.92 (1.85)
VGG 15-030	2.67 (1.78)	3.37 (1.97)	4.19 (2.17)	3.41 (1.98)
KM 2349	2.76 (1.81)	2.67 (1.78)	2.67 (1.78)	2.70 (1.79)
ML 818	1.76 (1.50)	2.11 (1.62)	3.26 (1.94)	2.38 (1.70)
Pusa 1671	1.97 (1.57)	2.04 (1.59)	3.00 (1.87)	2.34 (1.68)
Pusa 1672	1.43 (1.39)	1.96 (1.57)	3.02 (1.87)	2.13 (1.62)
Pant M6	2.39 (1.70)	2.72 (1.79)	2.64 (1.77)	2.58 (1.76)
PM 11-26	1.33 (1.35)	1.82 (1.52)	2.36 (1.69)	1.84 (1.53)
SML 1811	2.24 (1.66)	1.94 (1.56)	2.11 (1.62)	2.10 (1.61)
COGG 912	2.28 (1.67)	2.48 (1.73)	2.37 (1.69)	2.38 (1.70)
RMG 1092	2.65 (1.77)	2.38 (1.70)	3.09 (1.89)	2.71 (1.79)
PM 11-25	2.13 (1.62)	3.00 (1.87)	2.97 (1.86)	2.70 (1.79)
AKM 12-24	1.37 (1.37)	1.39 (1.38)	2.12 (1.62)	1.63 (1.46)
IGKM 06.26.5	1.99 (1.58)	2.82 (1.82)	3.23 (1.93)	2.68 (1.78)
RMG 1087	1.96 (1.57)	2.15 (1.63)	1.83 (1.53)	1.98 (1.57)
VGG 10-008	1.61 (1.45)	2.08 (1.61)	2.56 (1.75)	2.08 (1.61)
IGKM 05-18-2	1.75 (1.50)	1.88 (1.54)	3.56 (2.01)	2.40 (1.70)
AKM 12-24	1.42 (1.39)	1.72 (1.49)	1.95 (1.57)	1.70 (1.48)
HUM 12	1.03 (1.24)	2.09 (1.61)	2.42 (1.71)	1.85 (1.53)
Sem±	(0.11)	(0.09)	(0.10)	(0.10)
C.D. at 5%	(0.31)	(0.26)	(0.30)	(0.29)

*Mean of three replications, Figures in parenthesis are square root () transformed values

was counted from 5 randomly selected flowers of each genotype. The data on yield (q/ha) was also recorded for each genotype.

Results and Discussion

There were twenty genotypes of green gram which were grown for field evaluation against *B. tabaci*

TABLE- 3: Screening of certain green gram genotypes against Thrips, *Caliothrips indicus* under filed conditions during *Kharif* 2016

Genotypes	Mean Flower Thrips Population /5 flowers*			
	30 DAS	45 DAS	60 DAS	Mean
Pant M4	0.89(1.18)	2.00(1.58)	0.56(1.03)	1.15(1.28)
ML 2410	1.44(1.39)	2.20(1.66)	1.44(1.39)	1.72(1.49)
VGG 15-030	0.11(0.78)	0.36(0.93)	0.17(0.82)	0.21(0.84)
KM 2349	1.59(1.44)	2.15(1.63)	1.58(1.44)	1.77(1.51)
ML 818	1.23(1.32)	2.02(1.59)	1.27(1.33)	1.51(1.42)
Pusa 1671	1.44(1.39)	2.91(1.85)	1.46(1.40)	1.94(1.56)
Pusa 1672	1.17(1.29)	1.92(1.55)	1.67(1.47)	1.59(1.44)
Pant M6	0.17(0.82)	0.67(1.08)	0.60(1.05)	0.48(0.99)
PM 11-26	1.83(1.53)	2.40(1.70)	1.93(1.56)	2.06(1.60)
SML 1811	1.63(1.46)	2.42(1.71)	1.47(1.40)	1.84(1.53)
COGG 912	0.33(0.91)	0.58(1.04)	0.43(0.97)	0.45(0.97)
RMG 1092	1.38(1.37)	2.05(1.00)	1.64(1.46)	1.69(1.48)
PM 11-25	1.28(1.33)	2.68(1.78)	1.14(1.28)	1.70(1.48)
AKM 12-24	1.40(1.38)	2.24(1.66)	1.36(1.36)	1.67(1.47)
IGKM 06.26.5	1.33(1.35)	2.17(1.63)	1.55(1.43)	1.68(1.48)
RMG 1087	1.12(1.27)	1.42(1.39)	0.83(1.15)	1.13(1.28)
VGG 10-008	0.23(0.86)	1.44(1.39)	0.45(0.98)	0.70(1.10)
IGKM 05-18-2	1.64(1.40)	1.78(1.51)	1.38(1.37)	1.60(1.45)
AKM 12-24	1.54(1.43)	1.74(1.50)	1.61(1.45)	1.63(1.46)
HUM 12	1.08(1.26)	1.45(1.40)	1.57(1.44)	1.37(1.37)
SEm±	(0.13)	(0.16)	(0.14)	(0.14)
C.D. at 5%	(0.38)	(0.49)	(0.42)	(0.43)

*Mean of three replications, Figures in parenthesis are square root () transformed values

(Table-1). The maximum overall mean population of *B. tabaci was recorded* on genotype ML 2410 (3.20 whitefly/cage) followed by genotypes PM 11-25 (3.07 whitefly/cage) and genotype VGG 15-030 (2.96 whitefly/cage), whereas, minimum population of *B. tabaci* with genotype RMG 1087 (1.38 whitefly/cage), followed by genotype

TABLE-4: Yield of certain green gram genotypes during *Kharif* 2016

Genotypes	Yield (q/ha)	Genotypes	Yield (q/ha)
Pant M4	4.63	RMG 1092	6.00
ML 2410	5.30	PM 11-25	7.00
VGG 15-030	3.00	AKM 12-24	6.00
KM 2349	5.07	IGKM 06.26.5	6.33
ML 818	4.33	RMG 1087	6.00
Pusa 1671	5.67	VGG 10-008	7.67
Pusa 1672	4.33	IGKM 05-18-2	5.33
Pant M6	5.33	AKM 12-24	5.00
PM 11-26	5.00	HUM 12	7.33
SML 1811	5.40	SEm±	0.73
COGG 912	2.67	C.D. at 5%	2.09

AKM 12-24 (1.67 whitefly/cage) and genotype Pusa 1671 (1.75 whitefly/cage)[14,8].

The data pertaining to the population of *E. kerri* (Table-2) revealed that the overall mean highest population of jassid was recorded on genotype VGG 15-030 (3.41 jassids/cage) followed by genotypes ML 2410 (2.92 jassids/cage) and Pant M4 (2.83 jassids/cage), while lowest population on genotype AKM 12-24 (1.63 jassids/cage) followed by genotype AKM 12-14 (1.70 jassids /cage) and genotype PM 11-269 (1.84 jassids/cage)[14,16].

The overall highest mean population of thrips was recorded (Table-3) on genotype PM 11-26 (2.06 thrips/5 flowers) followed by genotypes Pusa 1671 (1.94 thrips/5 flowers) and SML 1811 (1.84 thrips /5 flowers). The lowest population of thrips was found on genotype VGG 15-030 (0.21 thrips / 5 flowers) followed by genotypes COGG 912 (0.45 thrips / 5 flowers) and Pant M 6 (0.48 thrips/ 5 flowers)[7].

In general the grain yield ranged from 2.67 (q/ha) to 7.67 9 (q/ha) in different green gram genotypes. The maximum grain yield was produced by genotype VGG 10-008 (7.67q/ha), followed by genotypes HUM 12 (7.33 q/ha) and PM 11-25 (7.00 q/ha), Whereas lowest grain yield was observed in genotype COGG 912 (2.67 q/ha) followed by genotypes VGG 15-030 (3.00 q/ha) and ML 818 (4.33 q/ha)[14,10] (Table-4).

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