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Compatibility studies on pesticides used for managing insect pests on Mungbean, *Vigna radiata*

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ABSTRACT

Field experiment was conducted for two years under rainfed condition to evaluate the efficacy of eight pesticides with different combination and doses in mungbean against insect pests at Pulses Research station, Sardarkrushinagar. Amongst them, the combination of thiomethoxam 25 WG(0.3 g/litre) + propiconazole 25 EC(1.0 ml/litre) was found effective against sucking pests whereas, the combination of thiomethoxam 25 WG(0.3 g/litre) + propiconazole 25 EC(1.0 ml/litre) were at with par spinosad 45 SC (0.6 g/litre) + propiconazole 25 EC (1.0 ml/litre) managing pod borers. However, the highest yield was obtained in the combination of spinosad 45 SC (0.6 g/litre) + propiconazole 25 EC (1.0 ml/litre).

Key words: Mungbean, leafhopper, pod borers and insecticides

Green gram *(Vigna radiata)* belonging to the family of *Leguminoseae* are highly nutritious containing 24.6% protein, 1.0% fat, 56.6% carbohydrate, Ca 0.08g/100gm, P 0.045 g/100gm, Fe 5.7mg/100 gm, vitamin 750 IU, thiamin 0.525 mg/100 gm, riboflavin 300 mg, fiber 2.2 gm/100 gm and provides 234 cal energy per 100gm. It is consumed in the form of split pulse as well as whole pulse, which is an essential supplement of cereal based diet.

India has achieved a record mungbean production of 1.61 million tonnes (MT) in the year 2016-17 in 3.31 million hectare area. (Anonymous 2018). Mungbean is attacked by a number of insect pests which cause a heavy loss to crop. Major insect pests are stemfly, thrips, whitefly, jassid and pod borers. The sucking insect pests not only reduce the vigor of the plants by sucking the sap but transmit diseases and affect the process of photosynthesis. The annual yield loss due to the insect pests has been estimated at about 30 per cent in urdbean and mungbean. (Shobharani *et al.*, 2017). Simultaneously powdery mildew and cercospora leaf spot occur in mungbean when high humidity coupled with favourable temperature (25 -30° C) occurs. Propiconazole, is a triazole fungicide which is effective against these diseases. Hence, the present study was investigated to evaluate the different combination insecticides and fungicide against insect pests for better growth and yield of mungbean under the agroecological conditions of North Gujarat.

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MATERIALS AND METHODS

A field experiment was conducted to test the compatibility of different pesticides against sucking pests (leafhoppers) and podborers (*Helicoverpa armigera)* in mungbean. The experiment was laid out in Randomized block design with total nine treatment replicated thrice.

The plot size was 4m x 1.5 m with spacing of 30cm X 10 cm. Variety GM 4 was sown during first fortnight of July during *kharif* 2016 and 2017. The treatment details are as follows:

Sr.No.	Treatments	Dose g/ml per litre
1	Thiomethoxam 25 WG + Propiconazole 25 EC	0.2 g+ 1.0 ml
2	Thiomethoxam 25 WG + Propiconazole 25 EC	0.3 g+ 1.0 ml
3	Spinosad 45 SC + Propiconazole 25 EC	0.5 ml + 1.0 ml
4	Spinosad 45 SC + Propiconazole 25 EC	0.6 ml + 1.0 ml
5	Neem based formulation + Propiconazole 25 EC	3 ml + 1.0 ml
6	Thiomethoxam 25 WG (Std. check)	0.3 g
7	Spinosad 25 EC	0.6 ml
8	Propiconazole 25 EC	1.0 ml
9	Untreated Control	-

Pesticides were applied at recommended doses at 35 to 40 days after sowing. Five randomly tagged plants from each net plots were selected. Sucking pests observation from three randomly selected leaves(upper, middle and bottom) from each plant were observed.First spray application were made at appearance of sucking pests and second spray at flower initiation stage. Observations were taken at weekly interval. Pods damaged due to different pod borers were recorded from 100 randomly collected pods at the time of harvest. All the data collected were statistically analyzed by Analysis of Variance Technique at 5% level of probability (Gomez and Gomez, 1984). Visual observations were made for phytotoxic effects if any, after spraying.

RESULTS AND DISCUSSION

Result: Nine pesticides with different doses were tested for their efficacy and compatibility against sucking insect pests and podborer of mungbean (Table 1). During 2016, the leafhopper population was significantly lower (1.11/leaf) in T_2 (thiomethoxam 25 WG + propiconazole 25 EC@0.3 g+ 1.0 ml/litre) followed by T_1 (Thiomethoxam 25 WG + Propiconazole 25 EC@0.2 g+ 1.0 ml/litre) and T_6 (Thiomethoxam 25 WG @0.3 g/litre) which were at par. Even in the year 2017, T_2 (0.31/leaf) maintained its supremacy and was at par with T_1 (Thiomethoxam 25 WG + Propiconazole 25 EC@ 0.2 g+ 1.0 ml/litre, T_6 (Thiomethoxam 25 WG @0.3 g/litre) and T_7 (Spinosad 25 EC@0.6 ml/litre). Even the pooled result proved the supremacy of T_2 which were at par with T_1 and T_6. The present study are in accordance with the results of Sesha Mahalakshmi *et al.* 2017 were the efficacy of thiamethoxam 25 WG was proved.

Per cent podborer damage was significantly lower (4.66%) in treatment T_4 (spinosad 45 SC + propiconazole 25 EC @0.6 ml + 1.0 ml/litre) and it was at par with T_2 and T_3 (spinosad 45 SC + propiconazole 25 EC @0.5 ml + 1.0 ml/litre, during 2016 . Whereas, in 2017 percent pod borer damage was significantly lower (3.20%) in T_2 and was at par with T_6 and T_7 Even the pooled result confirmed the efficacy of T_2 and was at par with T_4.

No phytotoxic effect was observed in any treatments. However the yield data reflected in 2016 was significantly higher (539 kg/ha) in T_4 and was at par with T_3. Significantly higher (301

Table 1 Compatibility of combination of pesticides on insect pests of mung bean

Sr. No.	Leafhopper/leaf*			Percent pod borer damage**			Yield (kg/ha)		
	2016	2017	Pooled	2016	2017	pooled	2016	2017	pooled
T1.	1.43(1.54)	1.35(1.34)	1.38(1.40)	13.76(5.66)	15.68(7.30)	14.72(6.50)	367	255	310
T2.	1.27(1.11)	1.31(1.22)	1.28(1.14)	13.46(5.42)	10.40(3.20)	11.93(4.25)	378	278	325
T3.	1.51(1.78)	1.51(1.78)	1.51(1.78)	12.88(4.97)	17.27(8.80)	15.08(6.75)	500	273	389
T4.	1.50(1.75)	1.47(1.66)	1.48(1.69)	12.46(4.66)	14.43(6.20)	13.45(5.40)	539	301	420
T5.	1.58(1.99)	1.61(2.09)	1.60(2.06)	14.15(5.98)	14.90(6.60)	14.52(6.25)	389	266	328
T6.	1.43(1.54)	1.39(1.43)	1.41(1.49)	15.68(7.30)	12.88(4.90)	14.28(6.05)	472	275	374
T7.	1.47(1.66)	1.43(1.54)	1.45(1.60)	13.76(5.66)	14.90(6.60)	14.33(6.15)	444	269	356
T8.	1.78(2.66)	1.70(2.33)	1.74(2.53)	17.44(8.99)	16.60(8.10)	17.02(8.55)	333	250	291
T9.	1.84(2.88)	1.77(2.63)	1.81(2.78)	20.84(12.24)	18.89(10.40)	19.86 (11.55)	173	134	154
S. Em. ±	0.03	0.04	0.05	0.35	0.81	0.76	16.56	12.02	17.71
C.D. at 5%	0.10	0.13	0.14	1.06	2.43	2.16	49.65	36.06	51.01
C.V. %	6.79	8.46	6.79	7.09	15.11	15.70	12.44	14.12	13.24

√ X + 0.5 transformed values . **Arcsin transformation. Figures in parenthesis are retransformed values

kg/ha) in T_4 which was at par with T_2, T_3, T_6 and T_7 was observed during 2017. This shows that the combination of T_4 (spinosad 45 SC + propiconazole 25 EC @0.6 ml + 1.0 ml/litre) was well suited as far as overall pest control and yield was concerned.

REFERENCES

Anonymous, 2018. Project Coordinator's report (mungbean and urdbean). All India Coordinated Research Project on MULLaRP.

Gomez, K. A. and Gomez, A. A. 1984. Statistical procedures for Agricultural Research, International. Rice Research. Institute. John Willy and Sons, New York, Chickester, Brisbane, Torento, Singapore. 643

Sesha MahaLakshmi, M., Sreekanth, M. and Adinarayana, M. 2018. *Journal of Entomology and Zoology Studies.* **6 (2):** *1136-1139.*

Shobharani, M. Sidramappa and Sunilkumar, N. M. 2017. *International Journal of Current Microbiology and Applied Sciences.* **6 (12):** 3374-3383.