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## Efficacy of sequential application of different insecticides on two different varieties of moong bean (*Vigna radiata* L.)

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### Abstract

The experiment was carried out on the field of Mr. Surja Ram, V.P.O. Kera Khera, Tehsil Abohar, District Fazilka, Punjab, India. The experiment was carried out during July-October 2018 to study the efficacy of sequential application of different insecticides on two different varieties of moong bean. The varieties IPM0203 and SML668 and insecticides were Dimethoate 30EC, Chlorantriliparole 18.5SC and NSKE 5% were used during the experiment. In this experiment the efficacy of insecticides was studied on parameters i.e, plant height, number of pods per plant, number of seed per pod, 1000 grain weight and yield per plot. From this experiment maximum plant height, no. of pods per plant and yield per plot was obtained from NSKE in IPM0203 and from Chlorantriliparole in SML 668. Maximum no. of seed per pod was obtained with the application of Chlorantriliparole and maximum 1000 grain weight was obtained from Chlorantriliparole in IPM0203 and from NSKE in SML668. Result revealed that there was decrease in these parameters as observation from the plot having no application of insecticides.

**Keywords:** insecticides, moong bean, plant height, pods, yield, chlorantriliparole

### Introduction

Moong bean is botanically recognized as *Vigna radiata* (L.) Wilczek and belongs to the kingdom Plantae, order Fabales and the family Fabaceae (Leguminosae). The moong bean is an annual, erect or semi-erect, reaching a height of 0.15-1.25m. It is slightly hairy with a well-developed root system. The stem are many branched sometimes twinning at the tips and erect. The flower pale yellow or greenish in colour. The pods are long cylindrical, hairy and pending. They contain 7 to 20 small, ellipsoid or cube shaped seeds. The seeds are variable in colour. Moong bean is a drought tolerant kharif pulse and require hot and dry climate. It can be grown in temperature regime of 25°C to 35°C. It required moderate rains of 85 to 100cm and full sunlight for at least 8 to 10 hours of sunlight daily. Moong bean can be cultivated in wide range of soil, from black cotton soils in North India, red laterite soils in South India and Sand soils in Rajasthan. It does best on deep, well drained loamy soils and does not prefer heavy soils. Avoid water logged soil and saline soils as they are not suitable for Moong bran cultivation. The pH range of soil between 6. 2-7.2. Kharel *et al* <sup>[1]</sup> studied that the most serious insect pest attacking on moong includes whitefly (*Bemisia tabaci*), bean thrips (*Megalurothrips distalis*), gram pod borer (*Helicoverpa armigera*) and legume pod borer (*Maruca vitrata*). Whitefly, jassid and flower thrips are the major sucking insect pest of eastern Uttar Pradesh. Whitefly is a vector of Moong bean Yellow Mosaic Virus (MYMV) and even low population densities is capable for wide range of transmission of MYMV. Although there are various risk associated with Insecticides application but still it has been considered as one of the most effective and quickest method of reducing insect pest population in the field. More often it forms the only solution to manage the out breaks of insect pests.

### Materials and Method

The experiment was carried out at farm of Mr. Surja Ram, Village Kera Khera, Teh. Abohar, Distt. Fazilka, Punjab during the kharif season of 2018. Crop was cultivated in eight plots and

Crop was cultivated in eight plots and each measuring 6.70×3.74 m of land. The field was properly prepared with disc plough followed by two ploughing with cultivator to make it free from weeds and clods. Planking was done to make a fine and leveled seed bed. Pure and healthy seeds at rate 8Kg per acre were used for sowing each variety. The time of sowing of both varieties of Moong was 20<sup>th</sup> of July. The crop was sown with the help of kera pora method with spacing of 30 cm×10 cm at a depth of 3-4 cm. Three irrigation were given at regular interval for better growth of crop. For controlling weeds in plots hand weeding was done. Three hand weeding was enough to control weeds. Plant height was measured manually by using measuring tape from ground surface to top most leaf of the plant. Total number of pods produced per plant and number of seed per pod were counted manually from each plot. 1000 seeds were taken after the threshing of crop for weight without any waste material. The seeds produced from each plot were weighed separately and the yield per plot was calculated accordingly.

### Treatments

#### Varieties

V<sub>1</sub>: IPM 0203

V<sub>2</sub>: SML 668

#### Insecticides

T<sub>1</sub>: Dimethoate 30EC (Rogar) @ 250 ml/acre

T<sub>2</sub>: Chlorantriliparole 18.5 SC (Coragen) 30-40 ml/acre

T<sub>3</sub>: Neem seed kernel extract 5% (Nimbecidine) 250 ml/acre

T<sub>4</sub>: Control

### Result and Discussions

#### Plant height (cm)

As from experiment, maximum plant height in IPM 0203 variety of moong was recorded in T<sub>3</sub> (53.24cm) and minimum in T<sub>1</sub> (49.36 cm) and maximum plant height of SML 668 variety was recorded in T<sub>2</sub> (51.82 cm) and minimum in T<sub>4</sub> (Control) (44.78 cm). The plant height of T<sub>3</sub> of V<sub>1</sub> recorded maximum plant height (53.24) in all treatments. Hossain *et al* [2] were recorded that maximum plant height was obtained in Ripcord (46.81cm) treated plot followed by Admire (46.52cm), Neem leaf extract (45.28cm) and minimum in Reflective tape (40.82cm) followed by Untreated (control) (38.44cm). Abbas *et al*. [3] studied that maximum plant height was obtained in plot that treated with Ulala (160.00cm) and minimum in Control (149.00cm).

#### Number of pods per plant

From the conducted experiment on moong bean, it was observed that maximum number of pods per plant in IPM 0203 variety was recorded in plot receiving T<sub>3</sub> treatment and minimum in T<sub>4</sub> plot. In SML 668 maximum number of pods produced per plant was recorded maximum in T<sub>2</sub> and minimum in T<sub>4</sub> plot. On an average T<sub>2</sub> has maximum no. of pods per plant and variety IPM 0203 has maximum no. of pods per plants. Raghu *et al* [4] reported that maximum no. of pods per plant was recorded in Malathion treated plot (20.75) followed by Nimbecidine (20.13), Methyl parathion (19.33) and minimum in Lakke leaf extract (18.95) followed by control (16.13). Pawar *et al*. [5] were studied that maximum no. of pods per plant was recorded in Cypermethrin (175.0/10 plants) and minimum in control (100.3/10 plants).

#### Number of seed per pod

From experiment, it was concluded that T<sub>2</sub> plot of both

varieties of moong having maximum number of seed per pod and T<sub>4</sub> having minimum number of seed per pod. Abbas *et al* [6] was reported that maximum no. of grains per pod in Deltaphos (6.86 and 6.90) followed by Triazophos (6.20 and 6.26), Talstar (6.16 and 6.25), Lorsban (6.03 and 6.20), Karate (6.03 and 6.6) and minimum control (5.03 and 5.95) during the both years 2007 and 2008 respectively. Shah *et al* [7]. Observed that maximum no. of seeds per pod were observed at high dose of Metasystox-R treated plot (23.33 seeds) and minimum in low dose of Fentro (15.67 seeds) followed by control (12.67 seeds).

#### 1000-grain weight (gm)

As from experiment on moong bean, it has been found that the maximum 1000-grain weight in V<sub>1</sub> was found in T<sub>2</sub> (51.8gm) followed by T<sub>1</sub> and T<sub>3</sub> both has same weight (51.5gm) and minimum in T<sub>4</sub> (51.3gm) and the maximum 1000-grain weight in V<sub>2</sub> was T<sub>3</sub> (49.6gm) followed by T<sub>1</sub> (49.5gm), T<sub>2</sub> (49.4gm) and T<sub>4</sub> (48.6gm) respectively. Khan *et al* [8]. Has been reported that all insecticides treatments significantly increased the seed weight over control during 2004 and 2005. The maximum 1000-grain weight 47.67 and 43.69 gm was obtained in treatment that receive 1000 ml Methamedophos in both year respectively and minimum in control 44.00 and 39.80 gm in both year respectively. Bharti *et al*. [9] were observed that the maximum weight of 1000 grain observed in Emamectin benzoate treated plot (165.35g) and minimum in Imidacloprid (159.04g), Neem oil (158.40g) and control (157.40g).

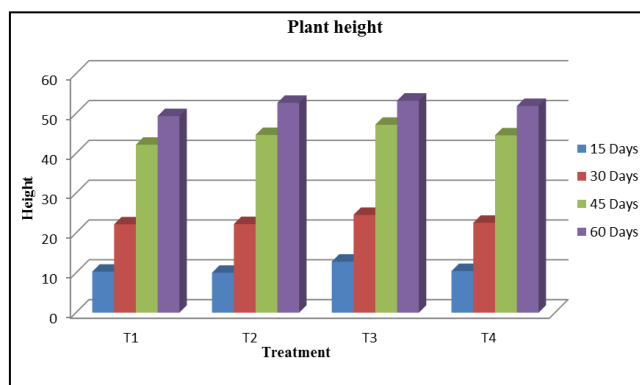
#### Yield per plot (kg/marla)

From experiment, it was observed that T<sub>3</sub> treatment of V<sub>1</sub> and T<sub>2</sub> treatment of V<sub>2</sub> having maximum yield per plot than other treatments of experiment. Hakeem *et al*. [10] studied that maximum yield per plot obtained from Tracer (Spinosad) (4.63kg) followed by Dursiban (Chloropyriphos) (3.98kg), Curacron (Profenophos) (3.55kg), Rogar (Dimethoate) (3.37kg) and minimum in Check (control) (2.33kg).

### Observations and Tables

**Table 1:** Effect of different insecticides on plant height (cm) of IPM 0203 variety of moong bean.

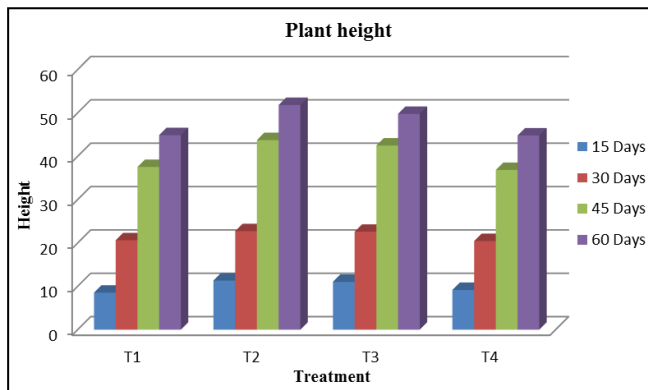
Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
15 Days	10.30	10.02	12.80	10.46
30 Days	22.18	22.24	24.56	22.58
45 Days	42.18	44.62	47.18	44.52
60 Days	49.36	52.70	53.24	51.90



**Fig 2:** Effect of different insecticides on plant height of IPM 0203 variety of moong bean.

**Table 2:** Effect of different insecticides on avg. plant height of SML 668 variety of moong bean.

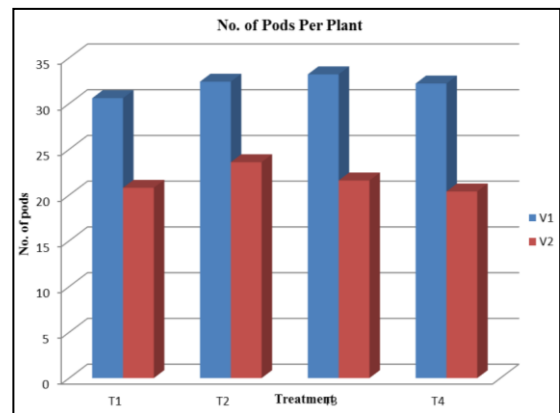
Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
15 Days	8.54	11.32	11.04	9.16
30 Days	20.62	22.72	22.58	20.44
45 Days	37.52	43.72	42.46	36.84
60 Days	44.86	51.82	49.76	44.78



**Fig 2:** Effect of different insecticides on plant height of SML 668 variety of moong bean.

**Table 3:** Effect of different insecticides on avg. no. of pods per plant of both varieties of moong bean.

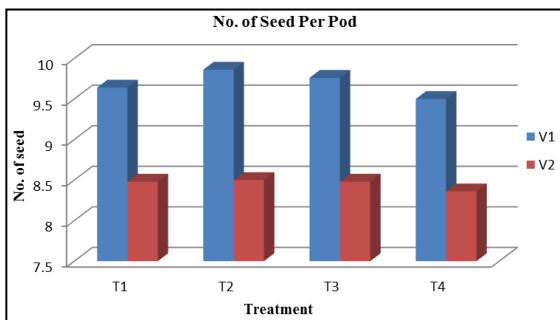
Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Average
V <sub>1</sub>	30.60	32.40	33.20	32.20	32.10
V <sub>2</sub>	20.8	23.60	21.60	20.40	21.60
Average	25.70	28.00	27.40	26.30	



**Fig 3:** Effect of insecticides on avg. no. of pods per plant of both varieties of moong bean.

**Table 4:** Effect of different insecticides on avg. no. of seed per pod of both variety of moong bean.

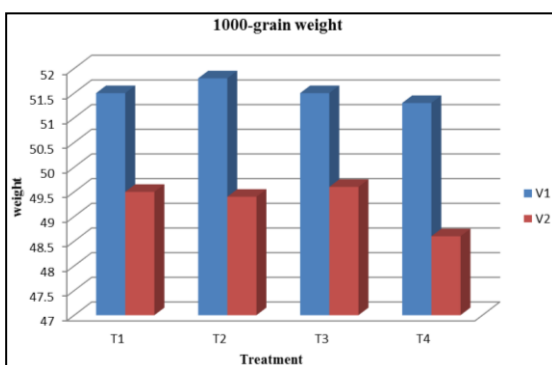
Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Average
V <sub>1</sub>	9.64	9.86	9.76	9.50	9.69
V <sub>2</sub>	8.48	8.50	8.48	8.36	8.46
Average	9.06	9.18	9.12	8.93	



**Fig 4:** Effect of different insecticides on avg. no. of seed per pod of both varieties of moong bean.

**Table 5:** Effect of different insecticides on 1000-grain weight (gm) of both varieties of moong bean.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Average
V <sub>1</sub>	51.50	51.80	51.50	51.30	51.50
V <sub>2</sub>	49.50	49.40	49.60	48.60	49.30
Average	50.50	50.60	50.60	49.95	



**Fig 5:** Effect of different insecticides on 1000-grain weight of both varieties of moong bean.

**Table 6:** Effect of different insecticides on yield per plot of both varieties of moong bean.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Average
V <sub>1</sub>	3.35	3.85	4.17	3.45	3.71
V <sub>2</sub>	2.59	3.00	2.84	2.20	2.66
Average	2.97	3.43	3.51	2.83	

**Conclusion**

The present experiment was carried out at village Kera Khera, Teh. Abohar, Distt. Fazilka, Punjab during the kharif season of 2018 to study the efficacy of sequential application of different insecticides on two different varieties of Moong bean (*Vigna radiata* L.). The result revealed that maximum plant height (53.24, 51.82 cm) obtained with the application of neem seed kernel extract in moong variety of IPM 0203 and chlorantroniliparole in moong variety of SML 668 respectively. IPM 0203 were produce maximum no. of pods per plant (32.1), maximum no. of grain per pod (9.69) and 1000 grain weight (51.5 gm). The maximum yield per plot (4.17, 3.00 kg) was obtained with the application of neem seed kernal extract in IPM 0203 and chlorantroniliparole in SML 668 respectively.

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