International Journal of Agricultural Sciences ☞DOI:10.15740/HAS/IJAS/19.1/301-304
Volume 19 | Issue 1 | January, 2023 | 301-304 ■ ISSN : 0973-130X Visit us : *www.researchjournal.co.in*

RESEARCH PAPER

Studies of SRC bio pesticide to control the insect infestation in vegetables

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Abstract : Biopesticides are products formulated from naturally occurring organisms such as fungi, plant and bacteria that are pathogenic or toxic to insect pests. Advantages to these products are that they have low environmental risk, low risk to non-target organisms including mammals and beneficial insects, and can help reduce resistance to pesticides when used in an integrated pest management programme. Biopesticides were experimented on different vegetable crops from different farmers, in which it was found that Biopesticides destroys the insects that damage the crops, also increases the yield. Biopasticidase was used on brinjal, tomato and chili, in which along with pest control, the yield of brinjal increased by 8.5%, the yield of tomato by 7.3% and the yield of chili was increased by 8.08%.

Key Words : SRC bio pesticide, Insect infestation, Vegetables

View Point Article : Ali, Mohd Nayeem, Kumar, Vikrant and Jakhar, Anjali (2023). Studies of SRC bio pesticide to control the insect infestation in vegetables. *Internat. J. agric. Sci.*, **19** (1) : 301-304, **DOI:10.15740/HAS/IJAS/19.1/301-304.**

Article History : Received : 19.09.2022**; Revised :** 22.11.2022**; Accepted :** 23.12.2022

INTRODUCTION

An organic insecticide (SRC Bio-Pestcide) was prepared by the Department of Agriculture, Shri Ram College to reduce the side effect of chemicals being used in agriculture. It is well known fact that in today's time, the use of chemicals is increasing which has side effect on human body. These poisonous substances enter inside human digestion system which leads to develop dangerous diseases. Beneficial micro-organisms living inside and outside of soil are destroyed which is important for crop production. Besides , cost of production of crop is increased many fold . Due to high cost of production farmers are getting less benefit. Slowly and slowly framers comes under pressure of loan and commit suicide. To overcome this problems we need a pesticide which is low cost, having low residual effect and can increase yield. The indigenous bio-pesticide can be a better tool for controlling the insect and improving the benefit of farmers. Keeping this in mind department of Agriculture has taken initiatives and prepared the bio-pesticide which is popularly called SRC Bio-Pesticide).

Material used:

The following materials were used for preparation of SRC Bio Pesticide. (1) Parthenium grass -1. 5 kg (2) *Neem* leaves -5 kg (3) Cow urine- 500 g,(4) Reetha powder- 50 g (5) 10 days old Lassi -3 kg.

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Fig. 1 : Bio-pesticide prepared in lab

Fig. 2 : Preparation of bio pesticide in lab

MATERIAL AND METHODS

To prepare the SRC Bio pesticide solution. First of all, 5 kg Parthenium and 5 kg *Neem* leaves were boiled in 5 liters of water, stop boiling when the water remained around 1 liter. Filter the boiled water and keep in a container. Mix rest of the ingredients(Cow urine- 500 g, Reetha powder- 50 g and 10 days old Lassi-3 kg) in it and kept for 10 days. After 10 days filter the solution and store in bottle.

How to use in crop:

Take 500 ml SRC bio-pesticide solution and mix thoroughly into 14 liters water and spray on the crop leaves with the help of a sprayer.

Effect of SRC-bio-pesticide on crop:

It was observed that after spray of SRC bio-pesticide on crop effect was seen within 3 days.

Type of crop chosen for the study. In the beginning plants of brinjil, tomato, chilies grown in pot were selected for the study.

RESULTS AND DISCUSSION

A preliminary study shows that after 3 days of spray significant improvement in the selected plant was observed.. With the application of SRC bio-pesticide 7.5 % increase in tomato yield, 9 % increase in brinjal yield and 7.8 % increase in chilli yield was noticed. These results were observed in a simple trial. The results have to be validating in a detail study.

Validation of trial:

The result observed in trial was discussed with industrialist who is involved in making Bio- pesticide.

Table 1 : Agronomical practices followed to grow brinjal, tomato and chilli in 400 sq meter at farmers field

Crop name	Chilli *capsicum annuum* L.) Solanaceae	Tomato *Lycopersicon esculentum* Mill	Brinjal *Solanum melongena* L.
Seed rate	15-20 g	10-15 g	15-18g
Varaities	Aparna	Pusa ruby	Pusa purple long
Transplanting	15 may	20 may	25 may
Plant distance	60x45 cm	90 x 60 cm	90x60 cm
Fertilizer	F.Y.M-1T.	F.Y.M- 1T.	FYM -1T
	N-5 kg	N-3 kg	N-2kg
	P-2.5kg	P-4kg	P-2kg
	K-2.3 kg	K-2kg	K-1.5kg
Irrigation	8-9	9-10	Every 3-4 dyas hot duration
Weed control	Pendimethalin 40g	Pendimethalin 40g	Pendimethalin 40g
Insect managment	Carbofuran 1% g @ 400 sq	Spray *Bacillus thuringiensis* 2g/lit	Spray *Neem* oil 2ml/lit
Disease management	Thiram or capton @ 4g	Copper oxychloride 0.2%	2% bordeaux mixture.
Harvesting	75 days	110- 115 days from transplanting	55 – 60 days
Yield	1 tonn	3-4tonn	2tonn

They were happy and encourage the efforts made by Shri Ram college. They offered a proposal of Rs. two lacks for conducting two years trials in different vegetables during 2020-21 at farmers field. Department of Agriculture has started the trials in brinja, tomato and chilli crops at different location on 5 farmers field. The one year trial conducted in 2020-21 report is given as under.

The trials on brinjal, tomato and chili were conducted in farmers field at 5 location in 400 square meter area. Recommended agronomical practices (Table 1) were adopted to grow the crops. To control the insects SRC Bio-pesticide was used in place of chemical insecticide available in the market. In one field SRC bio pesticide was sprayed at three times and in another plot no insecticide was used. Yield of each plot was taken and analyzed. Results of different vegetables are discussed as under.

Brinjal :

Pusa purple long variety of brinjal was grown for trial. Data on yield shown in Table 2 indicates that in control plots yield varied between 24-28 q/ha whereas in SRC biopesticide plots yield varied between 25-31 q/ ha. In control plots minimum yield of brinjal was found in plot -3 (24 q/ha) whereas the maximum yield (28q/ha) was recorded in plot no. 2 with an average of 25.6q/ ha. Similarly in SRC Bio-pesticide plots yield varies from 25-31 q/h with minimum 25 q/ha in plot 3 and maximum 31 q/ha in plot 4 with a average of 27.8 q/ha in SRC bio pesticide treated plot, respectively. On the basis of average yield recorded in control and SRC bio pesticide treated plot a 8.5% increase in yield was observed.

Tomato :

Pusa ruby variety of tomato was grown for trial. Data on yield shown in Table 2 indicates that in control

Table 2 : Yield obtained at farmers field under SRC bio-pesticide and control field

Sr. No.	Name of farmer	Village	Yield (q/ha)	
			Control	SRC Bio-pesticide
Brinjal (Pusa Purple Long)				
1.	Brajpal	Dudhali	25	27
2.	Sonu Kumar	Jhinjhana	28	29
3.	Kapil kumar	Patnipur	24	25
4.	Nitin Kumar	Manat	26	31
5.	Rahul Singh	Akabargarh	25	27
Tomato (Pusa Ruby)				
1.	Raj kumar	Charthawal	35	37
2.	Rohit Kumar	Talra	32	35
3.	Suresh Singh	Rasoolpur	34	37
4.	Jaiveer Singh	Rasoolpur	33	36
5.	Arun Chouchan	Baruki	36	37.8
Chili(Aparna)				
1.	Dharmpal	Khari	15	15.9
2.	Mahipal	Talra	10	10.8
3.	Mahaveer	Kadargarh	16	17.6
4.	Tejapl	Salapur	14	15.5
5.	Bijendra	Wazidpur	13	14.1

Table 3 : Effect of SRC bio-pesticide on the yield of vegetables during 2020-21

Sr. No.	Name of Vegetable	No of trials	Minimum yield (q/ha)		Maximum yield (q/ha)		Average yield (q/ha)		% increase over control
			Bio-pesticide	Control	Bio-pesticide	control	Bio-pesticide	control	
1.	Brinjal	5	25	24	3.1	28	27.8	25.6	8.5
2.	Tomato	5	33	32	36	38	36.5	34.0	7.3
3.	chilli	5	10.8	10.0	17.6	16.0	14.7	13.6	8.08

plots yield varied between 32-36 q/ha whereas in SRC biopesticide plots yield varied between 35-37.8 q/ha. In control plots minimum yield of tomato was found in plot -2 (32 q/ha) whereas the maximum yield (36q/ha) was recorded in plot no. 5 with an average of 34.0q/ha. Similarly in SRC Bio-pesticide plots yield varies from 35-37.8 q/h with minimum 35q/ha in plot 2 and maximum 37.8 q/ha in plot 5 with a average of 36.5 q/ha in SRC bio pesticide treated plot, respectively. On the basis of average yield recorded in control and SRC bio pesticide treated plot a 7.3% increase in yield was observed.

Chili :

Trial of chilli at 5 farmer's field was conducted to compare the effect of SRC bio-pesticide over control with Aparna variety. Data on yield shown in Table 2 indicates that in control plots yield varied between 10-16 q/ha whereas in SRC biopesticide plots yield varied between 10.8-17.6 q/ha . In control plots minimum yield of chilli was found in plot-2 (10 q/ha) whereas the maximum yield (16q/ha) was recorded in plot no. 3 with an average of 13.6/ha. Similarly in SRC Bio-pesticide plots yield varies from 10.8-17.6 q/h with minimum 10.8q/ha in plot 2 and maximum 17.6 q/ha in plot 3 with a average of 14.7 q/ha in SRC bio pesticide treated plot, respectively. On the basis of average yield recorded in control and SRC bio pesticide treated plot a 8.08 % increase in yield was observed.

Result of the effect of SRC bio-pesticide on the yield of brinjal, tomato and chili as shown in Table 3 shows that SRC biopesticide are found superior over control. As per results obtained in trial at farmers field SRC bio-pesticide may be a replacement of chemical and will be cost effective also. The results are in the line of results found by Gahukar (2013), Patel *et al.* (2019) and Akutse *et al.* (2020) also find the similar results.

Conclusion:

On the basis of finding in the trials we can conclude that SRC Bio pesticide may be effective and harmless bio-pesticide and can be used in organic farming successfully.

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