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Vikam Tigga
Department of Entomology, SHUATS, Allahabad, Uttar Pradesh, India

Ashwani Kumar
Department of Entomology, SHUATS, Allahabad, Uttar Pradesh, India

Hadi Husain Khan
Department of Entomology, SHUATS, Allahabad, Uttar Pradesh, India

Pushpendra Singh Sahu
Department of Entomology, SHUATS, Allahabad, Uttar Pradesh, India

Huma Naz
Department of Plant Protection, Aligarh Muslim University, Aligarh, U.P., India

Dilip Shriram Ghongade
Department of Entomology, Punjab Agricultural University, Ludhiana, Punjab, India

Correspondence
Vikam Tigga
Department of Entomology, SHUATS, Allahabad, Uttar Pradesh, India

Effect of different insecticides on Coccinellid and Spider in rice field in district Allahabad, U.P.

Vikam Tigga, Ashwani Kumar, Hadi Husain Khan, Pushpendra Singh Sahu, Huma Naz and Dilip Shriram Ghongade

Abstract
Rice is a seed of the grass species *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice). As a cereal grain, it is the most widely consumed staple food for a large part of the world's human population, especially in Asia. The pooled data indicates that all insecticides were effective over control in reducing the population of coccinellids recorded at 3rd, 7th and 14th days after insecticidal applications. Chloropyrifos was found significantly superior (.65, .50, .77) followed by Cypermethrin (.78, .66, .85), Carboryl (.85, .69, .82), Cartaf (.85, .68, .86), Imidaclorpid (.87, .64, .83), Tiomethoxam (.90, .60, .80), Triazophos (.85, .90, .95) as compared to control (1.18, 1.31, 1.44) at 3rd, 7th and 14th days respectively. Percentage population reduction of coccinellids recorded at 3rd, 7th and 14th days after insecticidal applications. Chloropyrifos found significantly superior (41.31, 59.70, 43.18) followed by Thiomethoxam (30.25, 58.50, 50.33) as compared to other treatments Cartaf (28.78, 49.15, 58.88), Imidachlorpid (29.64, 53.80, 45.14), Carborfuran (29.57, 46.81, 37.28), Carboryl (24.00, 44.93, 40.07) and Triazophos (17.65, 22.18, 29.79) respectively. The data for the efficacy of different treatments were evaluated on the basis of percentage population reduction. All the treatments were effective. The pooled data indicates that all insecticides were effective over control in reducing the population of Spider recorded at 3rd, 7th and 14th days after insecticidal applications. Imidachloprid was found significantly superior (.31, .22, .48) followed by Carboryl (.41, .36, .63) Triazophos (.64, .45. .60), Cartaf (.75, .43, .84) Thiomethoxam (.75, .62, .88), Cypermethrin (.86, .65, .93) and Chloropyrifos (.88, .77, 1.28) as compared to control (1.16 1.37, 1.41) at 3rd, 7th and 14th days respectively.

Keywords: Rice**,** Gundhi bug, Insecticides, Population

1. Introduction
Rice is the seed of the grass species *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice). As a cereal grain, it is the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the agricultural commodity with the third-highest worldwide production (rice, 741.5 million tonnes in 2014), after sugarcane (1.9 billion tonnes) and maize (1.0 billion tonnes) FAOSTAT, 2017) [4]. Rice (*Oryza sativa* L.) has supported a greater number of people for a longer period of time than any other crop since it was domesticated between 8,000 to 10,000 years ago (Greenland, 1997) [2]. At present, rice is the staple food for more people than wheat, and 90 percent of total rice production is grown and consumed in Asia (Evans, 1998) [3].

Material and methods
Experiment in the field was conducted during *kharif* season of 2016 with IR-6444 variety in research field of department of Entomology, Sam Higginbottom University of Agriculture, Technology & Sciences, Allahabad. The research farm is situated on the right side of Allahabad Rewa road at 20^0 and 15^0 North, 60^0 03 east longitude city and is about 129.2 cm above sea level. The site selected was uniform, cultivable with typical sandy loam soil having good drainage. The experiment was laid out in randomized block design, with four replications and eight treatments including untreated check with a plot size of 5m x 5m each. Twenty one days old seedlings were planted with a spacing of 20 x10 cm^2. The treatments comprised of foliar sprays of chemical insecticides, *viz*., Chloropyrifos 50% EC @ 2.5 ml ha, Cypermethrin 25% EC @ 250 ml /ha, Thiamethoxan 25% WP @ 100g/ha, Cartap 20% SP @ 500g /ha, Carbaryl 50% WP @ 625g /ha with Triazophos 40% EC @ 500g /ha and Imidacloprid 17.8 SL @ 100ml /ha.

Result and discussion

The pooled data presented in Table 2 and 3 indicates that all insecticides were effective over control in reducing the population of coccinellids recorded at 3, 7 and 14 days after insecticidal applications. Chloropyrifos was found significantly superior (.65, .50, .77) followed by Cypermethrin (.78, .66, .85), Carboryl (.85, .69, .82), Cartaf (.85, .68, .86), Imidaclorpid (.87, .64, .83), Tiomethoxam (.90, .60, .80), Triazophos (.85, .90, .95) as compared to control (1.18, 1.31, 1.44) at 3rd, 7th and 14th days respectively.

The data for the efficacy of different treatments were evaluated on the basis of percentage population reduction. All the treatments were effective. Percentage population reduction of coccinellids recorded at 3rd, 7th and 14th days after insecticidal applications. Chloropyrifos found significantly superior (41.31, 59.70, 43.18) followed by Thiomethoxam (30.25, 58.50, 50.33) as compared to other treatments Cartaf (28.78, 49.15, 58.88), Imidachlorpid (29.64, 53.80, 45.14), Carborfuran (29.57, 46.81, 37.28), Carboryl (24.00, 44.93, 40.07) and Triazophos (17.65, 22.18, 29.79) respectively **(**Mahi, *et al.*, 2012) [7].

Table 1: Effect of certain chemical insecticides on Coccinellids in rice field during Kharif season 2015:

Tr. No	Treatment	Before spray	3rd Day	7th Day	14th Day	Mean
T0	Control	1.10	1.18	1.31	1.44	1.23
T1	Imidachlorpid	1.15	0.87	0.64	0.83	0.87
T2	Thiomethoxam	1.20	0.90	0.60	0.80	0.87
T3	Chloropyrifos	1.03	0.65	0.50	0.77	0.73
T4	Carboryl	1.04	0.85	0.69	0.82	0.85
T5	Triazophos	0.96	0.85	0.90	0.95	0.91
T6	Cartaf	1.03	0.78	0.66	0.85	0.83
T7	Cypermethrin	1.11	0.85	0.68	0.86	0.86
F test		NS	S	S	S	S
CD (5%)		0.08	0.09	0.09	0.08	0.10
S.Ed.		0.04	0.04	0.04	0.04	0.05
CV %		4.87	7.12	8.12	6.15	8.30

Table 2: Per cent population reduction of Coccinellids population due to insecticides during Kharif season 2015.

Tr. no	Treatments	Before spray	3rd Day	7th Day	14th Day	Mean
T0	Control	1.10	-	-	-	-
T1	Imidachlorpid	1.15	29.64	53.80	45.14	42.86
T2	Thiomethoxam	1.20	30.25	58.50	50.33	46.36
T3	Chloropyrifos	1.03	41.31	59.70	43.18	48.06
T4	Carboryl	1.04	24.00	44.93	40.07	36.33
T5	Triazophos	0.96	17.65	22.18	29.79	23.20
T6	Cartaf	1.03	29.57	46.81	37.28	37.88
T7	Cypermethrin	1.11	28.78	49.15	58.88	45.60

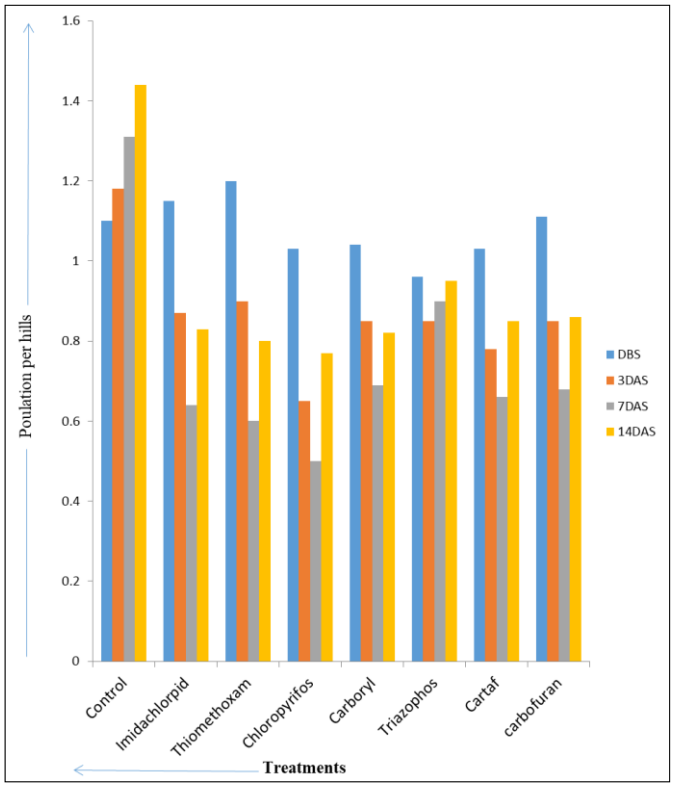

Fig 1: Graphical representation efficacy of certain chemical insecticides against coccinellid on rice field

The pooled data presented in Table 3 and 4 indicates that all insecticides were effective over control in reducing the population of Spider recorded at 3rd, 7th and 14th days after insecticidal applications. Imidachloprid was found significantly superior (.31, .22, .48) followed by Carboryl (.41, .36, .63) Triazophos (.64, .45. .60), Cartaf (.75, .43, .84) Thiomethoxam (.75, .62, .88), Cypermethrin (.86, .65, .93) and Chloropyrifos (.88, .77, 1.28) as compared to control (1.16 1.37, 1.41) at 3rd, 7th and 14th days, respectively.

The data for the efficacy of different treatments were evaluated on the basis of percentage population reduction. All the treatments were effective. Percentage population reduction of Spider recorded at 3rd, 7th and 14th days after insecticidal applications of Imidacloprid was found significantly superior (78.68, 87.10, 72.62) followed by Carboryl (70.42, 77.86, 62.30) as compared to other treatments Triazophos (53.06, 71.87, 63.50), Thiamethoxam (40.54, 58.10, 42.12), Cartaf (27.47, 64.56, 32.61), Cypermethrin (38.96, 39.31, 45.25)and Chloropyrifos (35.46, 51.87, 22.13) respectively **(**Muddasir, *et al.*, 2015) [8].

Table 3: Effect of certain chemical insecticides on Spiders in rice field during Kharif season 2015.

Spider population per hills						
Tr. No	Treatments	Before spray	After spray			
			3rd Day	7th Day	14th Day	Mean
T0	Control	1.03	1.16	1.37	1.41	1.24
T1	Imidachlorpid	1.28	0.31	0.22	0.48	0.57
T2	Thiomethoxam	1.11	0.75	0.62	0.88	0.84
T3	Chloropyrifos	1.20	0.88	0.77	1.28	1.03
T4	Carboryl	1.22	0.41	0.36	0.63	0.65
T5	Triazophos	1.20	0.64	0.45	0.60	0.72
T6	Cartaf	1.24	0.86	0.65	0.93	0.92
T7	Cypermethrin	0.91	0.75	0.43	0.84	0.73
F test		NS	S	S	S	S
CD (5%)		0.11	0.08	0.10	0.11	0.14
S.Ed.		0.05	0.04	0.05	0.05	0.07
CV %		6.45	7.24	11.00	8.13	12.54

Table 4: Percent population reduction of Spiders population due to insecticides during Kharif season 2015.

Tr. no	Treatments	Before spray	3rd Day	7th Day	14th Day	Mean
T0	Control	1.03	-	-	-	-
T1	Imidachlorpid	1.28	78.68	87.10	72.62	79.46
T2	Thiomethoxam	1.11	40.54	58.10	42.12	46.92
T3	Chloropyrifos	1.20	35.46	51.87	22.13	36.48
T4	Carboryl	1.22	70.42	77.86	62.30	70.19
T5	Triazophos	1.20	53.06	71.87	63.50	62.81
T6	Cartaf	1.24	38.96	39.31	45.25	41.17
T7	Cypermethrin	0.91	27.47	64.56	32.61	41.54

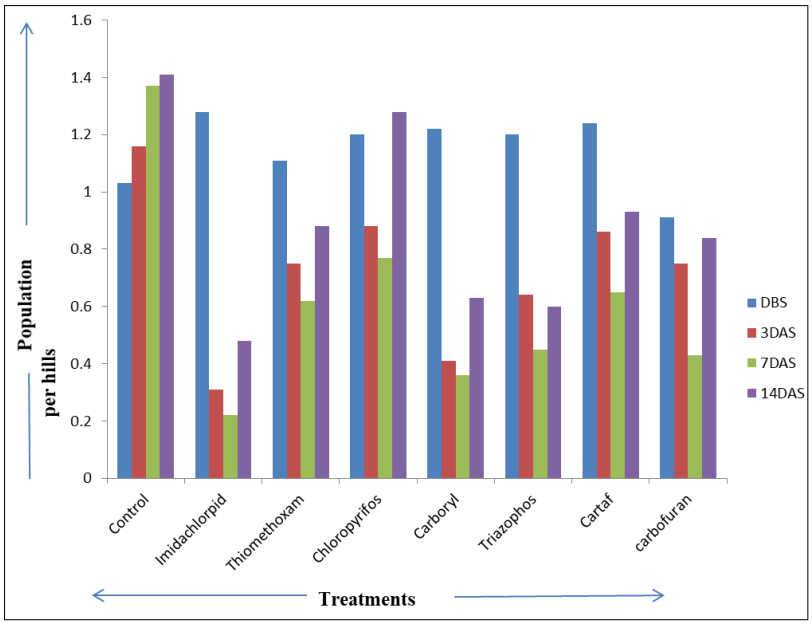

Fig 2: Graphical representation of efficacy of certain chemical insecticides against Spider on rice field

Cost Benefit Ratio: The yields among the treatment were significant. The highest yield and benefit cost ratio was recorded in T_1 Imidacloprid (45.700 q/ha and 1:3.36 respectively) supported by Choudhary *et al*., (2014) [1]. They suggested that Imidacloprid is a valuble chemical in the management of *L. acuta*. Next most effective treatment was T_3 Chloropyrifos (44.000 q/ha and 1:3.35 respectively), this was supported by Tiwari *et al*. (2014) [5], Patel *et al.* (2014) [6].

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