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Soil Application of Cyazypyr 20% SC for Jassid (*Empoasca flavescens*) Ishida Control in Brinjal

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The experiment was conducted in 2013 and 2014 in the University farm at Kalyani, West Bengal state of India. Brinjal 'Muktakeshi' was grown in plots measuring 5 m×5 m, at spacing of 1m x 0.75m with three replication during the period from mid- April to July, two year, following recommended package of practices. The plots were set out in a randomized block design with six treatments including an untreated check. Five rates of cyazypyr 20% SC (4.5 MAT ,6.0 MAT, 7.5MAT, 9.0 MAT and, 12 MAT in both year 2013 and 2014) were applied every year for their efficacy, cyazypyr 20% SC, 12 MAT was tested for their effect on crop health. cyazypyr 20% SC @ 9.0, 7.5 and 6.0 MAT (0.00 – 7.07 and 0.00 – 7.87 and .00 – 9.00) was found to be significantly lower as compared to untreated control.

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1. INTRODUCTION

Brinjal (*Solanum melongena* L.) is a widely used vegetable crops by most of the people and is popular in many countries *viz.,* Central, South and South East Asia, parts of Africa and Central America [1]. It is originating from India and second largest brinjal producing country after China with 27.1% share. It is an important vegetable grown in all the seasons. Due to its nutritive value, consisting of minerals like iron, phosphorous, calcium and vitamins like A, B and C, unripe fruit is the main vegetable in the country. Hence, it is subjected to attack by number of insect pests right from the nursery stage till harvesting [2]. Among the insect pests infesting brinjal, the major ones are epilachna beetle, *Epilachna vigintioctopunctata* (Fab.), shoot and fruit borer, *Leucinodes orbonalis* (Guen.), whitefly, *Bemicia tabaci* (Genn.), leafhopper, *Empoasca flavescens* (Distant), and non insect pest, red spider mite, *Tetranychus macfurlanei*. The main constraint in cultivation of brinjal is the pests and diseases outbreak. Among the different major insect pests infesting brinjal, epilachna beetle, *Epilachna vigintioctopunctata* (Fab.), is very important under West Bengal condition, There is a greater possibility of carryover of insect pests from one season to the next as it grown throughout the year. epilachna beetle, *Epilachna vigintioctopunctata* (Fab.), is critical pests of brinjal causing substantial yield loss. To combat these pests and minimize crop loss, the frequent use of toxic chemical insecticides has been a common practice to the brinjal growers. However, Among the various management practices, chemical control is commonly practiced by the farmers for management of insect pest on brinjal [3]. The new generation of pesticide molecules have been claimed to be effective as well as safer for non-target organisms [4-7]. The use of insecticides could be more effective depending on selection of chemicals, doses, method and time of application. Hence, keeping the above point in view, present investigation was carried to evaluate the bio-efficacy of cyazypyr 20% SC on Jassid *Empoasca flavescens*, under field condition.

2. MATERIALS AND METHODS

The experiment was carried out from 2013 to 2014 in the University farm at Kalyani, West Bengal state of India. Brinjal ‘Muktakeshi’ was grown in plots of 5 m×5 m, with a spacing of 1m x 0.75m with three replication during the period from mid- April to July, two year, following recommended package of practices. The plots were set out in a randomized block design with four rates of cyazypyr 20% SC, 4.5, 6.0, 7.5 and 9.0 MAT (Milligram active ingredient per target) were applied in soil at the base of the plant twice; first at time of planting and after 15 days of planting. The experiment consisted of five treatments, including an untreated control, and each treatment was replicated three times. Control plots were treated with equal amount of water only.

Data on the Htanumber of jassids (nymph and adults), was recorded at 10 days interval starting from 30 days after planting up to 60 days after planting from 5 randomly selected plants / plot following the same method as in the previous experiment.

3. RESULTS AND DISCUSSION

In 2013, Jassid densities recorded after 30 days of planting in plots treated with cyazypyr 20% SC at the rate of 9.0 and 6.0 MAT (0.73 and 1.23 nymph and adults / 5 leaves, respectively). These treatments showed similar efficacy in reducing jassid populations. Cyazypyr 20% SC at the rate of 4.5 MAT (2.87 nymph and adults / 5 leaves) was inferior to cyazypyr 20% SC at the rate of 6.0 MAT (1.23 nymph and adults / 5 leaves). Cyazypyr 20% SC at the rate of 7.5 MAT was harboured significantly lower jassid population (0.93) than the untreated control plots (7.13 nymph and adults / 5 leaves) [8-10].

After 40 days of planting, cyazypyr 20% SC at the rate of 9.0 and 7.5 MAT (2.73 and 2.47 nymph and adults / 5 leaves, respectively) was superior to the two lower rates of the same insecticide and untreated control (4.33, 6.40 and 7.07 nymph and adults / 5 leaves, respectively). Cyazypyr 20% SC at the rate of 6.0 and 4.5 MAT (4.33 and 6.40 nymph and adults / 5 leaves, respectively) showed significant difference among them in respect of jassid population and both treatments differed significantly from untreated control (7.07 nymph and adults / 5 leaves).

After 50 days of planting, cyazypyr 20% SC @ 9.0 and 7.5 MAT maintained their superiority in

Table 1. Number of jassid / 5 leaves due to different treatments

Treatment	2013				2014			
	30DAS	**40DAS**	**50DAS**	**60DAS**	**30DAS**	**40DAS**	**50DAS**	**60DAS**
Cyazypyr 20% @ 4.5MAT	2.87(1.69)	6.40(2.52)	7.87(2.80)	9.07(3.01)	3.20(1.79)	5.73(2.39)	7.40(2.72)	8.27(2.87)
Cyazypyr 20% @ 6.0 MAT	1.23(1.10)	4.33(2.07)	5.00(2.22)	9.00(3.00)	2.13(1.50)	3.20(1.78)	4.33(2.07)	8.27(2.87)
Cyazypyr 20% @ 7.5 MAT	0.93(0.96)	2.73(1.65)	3.00(1.73)	8.07(2.84)	0.93(0.96)	1.33(1.15)	3.47(1.86)	7.27(2.69)
Cyazypyr 20% @ 9.0 MAT	0.73(0.84)	2.47(1.56)	2.87(1.69)	7.20(2.68)	0.73(0.84)	1.07(1.03)	2.47(1.56)	5.80(2.40)
Untreated Control	7.13(2.67)	7.07(2.65)	8.00(2.83)	9.00(3.00)	6.53(2.53)	7.67(2.77)	6.07(2.46)	8.27(2.87)
Means								
CD	0.37	0.40	0.14	NS	0.40	0.38	0.40	0.25

Values within parentheses are square root transformedMAT- milligram ai per target* controlling jassid. Cyazypyr 20% SC @ 6.0 MAT had significantly lower jassid population (5.0 adults and grubs / 5 leaves) than untreated control (8.0 nymph and adults / 5 leaves). Cyazypyr 20% SC @ 4.5 MAT (7.87 nymph and adults / 5 leaves) failed to show any significant difference from untreated control (8.00 nymph and adults / 5 leaves).

After 60 days of treatment, both 6.0 and 4.5 MAT doses of cyazypyr 20% SC (9.0 - 9.07 nymph and adults / 5 leaves, respectively) became on a par with untreated control (9.0 nymph and adults / 5 leaves). Cyazypyr 20% SC @ 9.0 and 7.5 MAT showed significant difference from its two lower doses and untreated control. Mandal et. al. (2012), Mandal et al. (2010) and Chand et. al.(2018) This experiment revealed that all these treatments were significantly superior over untreated control. The most effective treatment was cyazypyr 10% OD @ 105g a.i./ha followed by cyazypyr 10% OD @ 90g a.i./ha [11-15].

In the season 2014, all the doses of cyazypyr 20% SC were superior to untreated control in reducing jassid population. Cyazypyr 20% SC @ 6.0 and 4.5 MAT (2.13 - 3.20 nymph and adults / 5 leaves, respectively) was on a par among them. These two treatments showed significant difference from cyazypyr 20% SC @ 9.0 and 7.5 MAT (0.73 and 0.93 nymph and adults / 5 leaves, respectively).

After 40 days of treatment, cyazypyr 20% SC @ 9.0 and 7.5 MAT had (1.07 and 1.33 nymph and adults / 5 leaves, respectively and these two treatments were superior to rest of the insecticidal treatments in controlling jassid population. Jassid population recorded in cyazypyr 20% SC @ 6.0 MAT (4.33 / 5 leaves) was superior to its 4.5 MAT dose. Cyazypyr 20% SC @ 4.5 MAT (5.73 nymph and adults / 5 leaves) failed to show any significant difference from untreated control (7.67 nymph and adults / 5 leaves).

After 50 days of treatment, cyazypyr 20% SC @ 9.0 and 7.5 MAT was statistically at par among them in respect of jassid population (2.87 and 3.00 / 5 leaves, respectively). Cyazypyr 20% SC @ 4.5 MAT (7.40 nymph and adults / 5 leaves) failed to show any significant difference from untreated control (6.07 adults and grubs / 5 leaves) Cyazypyr 20% SC @ 6.0 MAT , though inferior to the two higher doses was superior to 4.5 MAT dose and untreated control.

After 60 days of treatment, cyazypyr 20% SC @ 9.0, 7.5 and 6.0 MAT (7.20, 8.07, and 9.00 jassid / 5 leaves, respectively) followed same trend as above in reducing jassid population than untreated control (9.00 jassid 5 leaves) Cyazypyr 20% SC @ 4.5 MAT (9.07 jassid) failed to show any significant difference from untreated control.

4. CONCLUSION

The present investigation highlights the bio-efficacy of cyazypyr 20% SC on Jassid Empoasca flavescens, under field condition.The use of insecticides could be more effective depending on selection of chemicals, doses, method and time of application.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Biswas RK, Chaterjee M. Effectiveness of some systemic insecticides against the whitefly, Bemisia tabaci (Gennadius), on brinjal and the jassid, Amrasca biguttula biguttula Ishida, on okra. Pest Management and Economic Zoology. 2008;16(1):37-42.
2. Borad PK, Patel HM, Chavda N, Patel JR. Bio-efficacy of endosulfan and cypermethrin mixture against insect pests of brinjal (*Solanum melongena*). IndianJournal of Agricultural Sciences. 2002;72:685-88.
3. Hall T. Ecological effects assessment of flubendiamide. Pflanz.-Nach, Bayer 2007; 60(2):167–182.
4. Harish DK, Agasimani AK, Imamsaheb SJ. Patil Satish S. Growth and yield parameters in brinjal as influenced by organic nutrient management and plant protection conditions. Research Journal of Agricultural Sciences. 2011;2(2):221-225.
5. Latif MA, Rahman MM, Alam MZ. Efficacy of nine insecticides against shoot and fruit

borer, Leucinodes orbonalis Guenee (Lepidoptera: Pyralidae) in eggplant. J. Pestic Sci. 2010;83:391-397.
6. Manda IS, Singh NJ, Konar A. Efficacy of synthetic and botanical insecticide against whitefly (*Bemicia tabaci*) and shoot and fruit borer (*Leucinodes orbonalis*) on brinjal (Solanum melongena L.); 2010.
7. Mandal SK. Bio-Efficacy of Cyazypyr 10% OD, a New Anthranilic Diamide Insecticide,against the Insect Pests of Tomato and Its Impact on Natural Enemies and Crop Health Acta Phytopathologica et Entomologica Hungarica. 2012;47(2):233–249
8. Misra HP. New promising insecticides for the management of brinjal shoot and fruit borer, Leucinodes orbonalis Guenee. Pest Manage. Hort. Ecosys. 2008;14(2):140–147.
9. Muthukumar M, Kalyanasundaram M. efficacy of certain insecticides against major suckine insects of brinjal (*Solanum melongena* L.). South Indian brinjal (*Solanum melongena* L.). South Indian. 2003;51:207-13.
10. Patel JJ, Patel BH, Bhatt HV, Maghodia AB, Bhalala MK. Bioefficacy of diafenthiuron 50 WP against sucking pests of brinjal (*Solanum melongena* L.). Indian Journal of Entomology. 2006;68(3): 272-73.
11. Regupathy A, Palanisamy S, Chandramohan N, Gunathilagaraj K. A guide on crop pests. Sooriya Desk Top Publishers, Coimbatore. 1997;264.
12. Sontakke BK, Das N, Swain LK. Bioefficacy of ememectin benzoate against boll worm complex in cotton. Ann. Pl. Protec. Sci. 2007;15(1):371–376.
13. Tonishi MH, Nakao T, Furuya A, Seo H, Kodama K, Tsubata S, Fujioka H, Kodama T, Hirooka T, Nishimatsu T. Flubendiamide, a novel insecticide highly active against lepidopterous insect pests. J. Pestic. Sci. 2005;30:354–360.
14. Manda IS, Singh NJ, Konar A. Efficacy of synthetic and botanical insecticide against whitefly (*Bemicia tabaci*) and shoot and fruit borer (*Leucinodes orbonalis*) on brinjal (Solanum melongena L.); 2010.
15. Mandal SK. Bio-Efficacy of Cyazypyr 10% OD, a New Anthranilic Diamide Insecticide,against the Insect Pests of Tomato and Its Impact on Natural Enemies and Crop Health Acta Phytopathologica et Entomologica Hungarica. 2012;47(2):233–249.

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