



BIO EFFICACY OF CYANTRANILIPROLE AGAINST INSECT PESTS OF BRINJAL

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Abstract- Field trials were conducted at Agricultural Research Station, Kawadimatti, during *kharif* 2010-11 and 2011-12 to evaluate the efficacy of new anthranilic diamide, Cyantraniliprole (Cyazypyr) (HGW 86) 10.26 % OD at different dosages for the management of insect pests of brinjal (*Solanum melongena* L.). The standard insecticides viz., Chlorantraniliprole 18.5% SC, Spinosad 45% SC and Imidacloprid 17.8% SL were used for comparison. Overall, the field trials revealed that, Cyantraniliprole 10.26 %w/w OD @ 90 g a.i./ha provided cross-spectrum control of insect pests as it registered lowest number of hoppers (0.26/leaf), whitefly (0.40/leaf), thrips (5.16/leaf) at 10 days after application and also recorded lowest percent fruit damage by shoot and fruit borer (1.09%) and highest yield of 49.70 t/ha during season I. Whereas the standards, Chlorantraniliprole, Spinosad and Imidacloprid recorded a yield of 42.17, 42.28 and 23.86 t/ha, respectively. The same trend was noticed during season II (2011-12). The studies indicated that Cyantraniliprole 10.26 %w/w OD @ 90 g a.i./ha can be recommended in an Integrated Pest Management Program (IPM) of brinjal for the management of insect pests and harnessing higher yield.

Keywords- Brinjal, Cyantraniliprole, efficacy and insects.

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Introduction

Brinjal is one of the highly cultivated crops through year for the nutritive value. The eggplant is cultivated 2 million ha with 33 million-tonne production. India is second largest cultivator of eggplants next to China [1]. Total vegetable production, the brinjal alone occupy 9% of the country. It cultivated more than 0.5 million ha and the yield was 16.08 t/ha [2].

Brinjal production is severely affected by various pests. The major pests is *Leucinodes orbonalis* and it affect the yield of crop [2]. Past two decades *L. orbonalis* is a main destructive pest. Once the larva bores into petiole and midrib of leaves and tender shoots, it causes dead hearts. In later stages, it also bore into flower bud and fruits with a yield reduction up to 70 percent [3].

Farmers mostly rely on chemical pesticides for controlling pest population. In the past, several chemical insecticides have been proved effective in controlling the pests. However, development of resistance to conventional insecticides against the pest is a serious threat to India. Additional novel chemistries for the management of insect pests. For control the pests cyantraniliprole belongs to anthranilic diamide group are focused [4]. The cyantraniliprole affect the regulation of muscle contraction [5]. Therefore, efforts have been made in the present study to evaluate the efficacy and to find out the optimum dose of cyantraniliprole against insect pests of brinjal.

Material and Methods

Evaluations of the Cyantraniliprole 10.26% w/w OD was undertaken in an experimental block against brinjal insect pests at Agricultural Research Station, Kawadimatti during *Kharif* 2010-11 and 2011-12. In the present study was laid out in a randomized block design (RBD) with three replications. The test chemical, Cyantraniliprole 10.26% w/w OD (supplied by DuPont India Pvt. Ltd) was tested at four different concentrations viz., 60, 75, 90 and 105 g a.i./ha for bio-efficacy. The test chemical, Cyantraniliprole was compared with standard checks viz.,

Chlorantraniliprole 18.5% SC, Imidacloprid 17.8% SL and Spinosad 45% SC against brinjal insect pests and untreated control. Six rounds of foliar spray have been done at 10 days interval. Two back to back sprays at 10 days interval were applied whenever population build up of insect pest above ETL was observed at 1st and 2nd spray – Hoppers and shoot and fruit borer, 2nd and 3rd spray – Whitefly, 3rd and 4th spray – Thrips, 5th and 6th spray – Aphids. All the agronomic packages were followed as per recommended package of practices of UAS Raichur, Karnataka, India. Methodology of Rachana [6] was followed to record the pests of brinjal. All observations were recorded from five tagged plants per plot. All insects were recorded on 3, 7 and 10 days after each application. The number of thrips and aphids (nymphs and adults) were recorded on five terminal leaves per plant, while whitefly numbers were recorded on five leaves (2 top leaves, 2 middle leaves and 1 lower leaf). Shoot damage was recorded from 5 tagged plants by counting the number of shoots and shoots damaged and percent fruit damage was estimated from healthy and damaged fruit count at every harvest. The final marketable yield was recorded plot wise at every picking and presented as t/ha. The yield was presented a total of 5 pickings. The data collected from two seasons were pooled. The yield data collected from the each plot was extrapolated on hectare basis.

Statistical analysis

The bio-efficacy data were subjected to statistical analysis by using DMRT (Duncan's Multiple Range Test) by Gomez and Gomez [7].

Results

Observations on pest population were recorded a day before application (DBA), 3 days after application (DAA) and 7 DAA. Natural enemy population and yield were recorded.

Leaf Hoppers population

The number of leaf hoppers per leaf was non-significant a day before treatment imposition during season I (2010-11) showed uniformity in the incidence of the pests in the experimental plots. Three days after treatment imposition, hopper population was ranged between 0.78-4.81 per leaf. The treatment Cyantraniliprole 10.26% @ 105 g a.i./ha and Imidacloprid 17.8% SL @ 25 g a.i./ha were recorded significantly lower population of 0.78 hoppers/leaf followed by Cyantraniliprole 10.26% @ 90 g a.i./ha (0.93/leaf) showed 0.93/leaf. Whereas, Chlorantraniliprole 18.5% SC @ 40 g a.i./ha and Spinosad 45% SC @ 75 g a.i./ha recorded 3.34 and 3.38 hoppers per leaf respectively and were on par with each other. Untreated

control recorded highest hopper population (4.81/leaf) [Table-1].

Seven days after treatment, hopper population was ranged between 0.37 and 4.10 per leaf. The treatment Cyantraniliprole 10.26% @ 90 g a.i./ha recorded significantly lower population of 0.37 hoppers/leaf and was on par with Cyantraniliprole 10.26 % @ 105 g a.i./ha (0.41/leaf) followed by Imidacloprid 17.8% SL @ 25 g a.i./ha (0.64/leaf). Whereas, Chlorantraniliprole 18.5% SC @ 40 g a.i./ha and Spinosad 45% SC @ 75 g a.i./ha recorded 2.87 and 3.29 hoppers per leaf respectively. Untreated control recorded highest hopper population (4.10/leaf). The same trend has noticed even ten days after treatment [Table-1].

Table-1 Efficacy of Cyantraniliprole 10.26 w/w OD against brinjal leaf hoppers

	TREATMENTS	DOSE ga.i./ha	I SEASON				II SEASON			
			1DBS	3DAS	7DAS	10DAS	1DBS	3DAS	7DAS	10DAS
1	Cyantraniliprole 10.26 w/w OD	60	4.33 (2.08)	3.12b (1.76)	2.58bc (1.60)	2.30bc (1.51)	4.21 (2.01)	4.09b (2.01)	3.49b (1.86)	3.12c (1.75)
2	Cyantraniliprole 10.26 w/w OD	75	5.21 (2.28)	2.65b (1.62)	2.16c (1.44)	2.09c (1.41)	5.16 (2.27)	3.61b (1.90)	3.22b (1.77)	2.82c (1.67)
3	Cyantraniliprole 10.26 w/w OD	90	5.00 (2.23)	0.93c (0.96)	0.37d (0.60)	0.26d (0.50)	5.31 (2.30)	1.99c (1.41)	1.16c (0.98)	1.01d (1.00)
4	Cyantraniliprole 10.26 w/w OD	105	5.36 (2.31)	0.78c (0.88)	0.41d (0.64)	0.33d (0.57)	4.83 (2.19)	1.81c (1.34)	1.00c (1.00)	0.80d (0.89)
5	Chlorantraniliprole 18.5% SC	40	4.73 (2.17)	3.34b (1.82)	2.87bc (1.67)	2.73bc (1.63)	5.06 (2.24)	4.41b (2.10)	4.42b (2.10)	4.79b (2.18)
6	Imidacloprid 17.8% SL	25	5.01 (2.23)	0.78c (0.88)	0.64d (0.80)	0.52d (0.72)	4.61 (2.14)	1.49c (1.22)	1.26c (1.12)	0.84d (0.91)
7	Spinosad 45% S C	75	5.82 (2.41)	3.38b (1.83)	3.29ab (1.81)	3.07ab (1.75)	4.80 (2.19)	4.10b (2.02)	4.41b (2.10)	4.96b (2.22)
8	Untreated Control	-	5.13 (2.26)	4.81a (2.15)	4.10a (2.01)	4.15a (2.02)	5.33 (2.28)	6.88a (2.60)	6.49a (2.54)	7.10a (2.64)
	S. Em+		0.42	0.09	0.11	0.09	0.33	0.08	0.12	0.09
	CD at 5%		NS	0.28	0.33	0.29	NS	0.26	0.36	0.27

Figures in the parentheses are square root transformed values.

DAS=Days After Spray

Means that do not share a letter are significantly different.

Three days after treatment during season II (2011-12), hopper population was ranged between 1.81 and 6.88 per leaf. The treatment Cyantraniliprole 10.26% @ 105 g a.i./ha recorded significantly lower population of 1.81 hoppers/leaf and was on par with Cyantraniliprole 10.26% @ 90 g a.i./ha (1.99/leaf) followed by Imidacloprid 17.8% SL @ 25 g a.i./ha (1.49/leaf). Whereas, Chlorantraniliprole 18.5% SC @ 40 g a.i./ha and Spinosad 45% SC @ 75 g a.i./ha recorded 4.41 and 4.10 hoppers per leaf respectively and were on par with each other. Untreated control recorded highest hopper population (6.88/leaf). The same trend has noticed during seven and ten days after treatment imposition [Table-1].

Thrips population

Three days after the treatment imposition during season I (2010-11), thrips population was ranged between 3.33 and 14.16 per leaf. Significantly lowest number of thrips recorded in Cyantraniliprole 10.26% @ 90 g a.i./ha (3.33/leaf) and Cyantraniliprole 10.26% @ 105 g a.i./ha (3.33 /leaf) and were on par with each other, followed by Spinosad 45% SC and Imidacloprid 17.8% SL recorded 4.50 and 4.67 per leaf respectively. Untreated control recorded highest thrips population (14.16/leaf). The same trend has noticed during seven and ten days after treatment imposition and during season II (2011-12) [Table-2]

Table-2 Efficacy of Cyantraniliprole 10.26 w/w OD against brinjal Thrips

	TREATMENTS	DOSE g a.i./ha	I SEASON				II SEASON			
			1DBS	3DAS	7DAS	10DAS	1DBS	3DAS	7DAS	10DAS
1	Cyantraniliprole 10.26 w/w OD	60	12.33 (3.51)	7.00 ^a (2.64)	7.83 ^a (2.79)	9.00 ^a (3.00)	4.86 (2.19)	3.27 ^{bc} (1.80)	3.23 ^c (1.78)	2.73 ^c (1.65)
2	Cyantraniliprole 10.26 w/w OD	75	14.51 (3.80)	6.66 ^a (2.58)	7.50 ^a (2.73)	8.66 ^{cd} (2.93)	4.23 (2.05)	3.06 ^c (1.74)	2.73 ^c (1.63)	2.67 ^c (1.63)
3	Cyantraniliprole 10.26 w/w OD	90	14.33 (3.78)	3.33 ^a (1.82)	4.33d (2.08)	5.16 ^a (2.24)	5.21 (2.28)	2.66 ^c (1.63)	1.54 ^d (1.24)	1.05 ^d (1.02)
4	Cyantraniliprole 10.26 w/w OD	105	13.43 (3.66)	3.33 ^a (1.82)	4.16 ^a (2.03)	4.83 ^a (2.19)	4.83 (2.19)	2.54 ^c (1.59)	1.14 ^d (1.06)	0.94 ^d (0.96)
5	Chlorantraniliprole 18.5% SC	40	12.88 (3.58)	10.33 ^b (3.21)	11.33 ^b (3.36)	11.83 ^b (3.43)	5.60 (2.36)	4.41 ^b (2.06)	4.43 ^b (2.10)	4.30 ^b (2.06)
6	Imidacloprid 17.8% SL	25	13.00 (3.60)	4.67 ^a (2.16)	6.33 ^c (2.51)	6.50d ^a (2.54)	4.56 (2.13)	2.81 ^c (1.67)	1.51 ^d (1.22)	1.18 ^d (1.08)
7	Spinosad 45% S C	75	14.33 (3.78)	4.50 ^{ab} (2.12)	4.16 ^a (1.99)	6.16 ^a (2.42)	4.33 (2.08)	4.41 ^b (2.06)	4.40 ^b (2.09)	4.06 ^b (2.00)
8	Untreated Control	-	13.89 (3.72)	14.16 ^a (3.73)	15.50 ^a (3.92)	15.50 ^a (3.93)	4.76 (2.14)	6.06 ^a (2.45)	6.14 ^a (2.47)	6.36 ^a (2.51)
	S. Em+		0.39	0.11	0.11	0.14	0.35	0.10	0.07	0.07
	CD at 5%		NS	0.33	0.35	0.42	NS	0.31	0.23	0.22

Figures in the parentheses are square root transformed values.

DAS=Days After Spray

Means that do not share a letter are significantly different

Whitefly population

Three days after treatment during season I (2010-11), whitefly population was ranged between 0.93 and 6.75 per leaf. Significantly lowest number of whitefly recorded in Cyantranilprole 10.26% @ 105 g a.i./ha (0.93/leaf) and Cyantranilprole 10.26% @ 90 g a.i./ha (1.08/leaf) and were on par with each other, followed by Imidacloprid 17.8% SL recorded 1.47 per leaf. Untreated control recorded highest whitefly population (6.75/leaf). The same trend has noticed during seven and ten days after treatment imposition and during season II (2011-12) [Table-3].

Shoot damage by shoot and fruit borer

Per cent shoot damage caused by shoot and fruit borer varied between 10.23 and 12.34 in all the treatments a day before spray. Three days after the treatment imposition during season I (2010-11), Significantly lowest per cent of shoot damage per five plants was recorded in Cyantranilprole 10.26% @ 90 g a.i./ha (3.68%) and Cyantranilprole 10.26% @ 105 g a.i./ha (3.51%) and were on par with each other. Whereas, Chlorantranilprole 18.5% SC @ 40 ga.i./ha and Spinosad 45% SC @ 75 g a.i./ha recorded 4.36 and 4.53 percent shoot damage respectively and were on par with each other. Untreated control recorded highest percent shoot damage (11.73). The same trend has noticed during seven and ten days after treatment imposition and during season II (2011-12) [Table-4].

Table-3 Efficacy of Cyantranilprole 10.26 w/w OD against brinjal whitefly

	TREATMENTS	DOSE ga.i./ha	I SEASON				II SEASON			
			1DBS	3DAS	7DAS	10DAS	1DBS	3DAS	7DAS	10DAS
1	Cyantranilprole 10.26 w/w OD	60	5.53 (2.35)	3.28 ^c (1.81)	2.28 ^c (1.50)	2.25 ^b (1.50)	6.30 (2.50)	3.46 ^c (1.86)	3.27 ^c (1.80)	3.05 ^c (1.74)
2	Cyantranilprole 10.26 w/w OD	75	6.00 (2.44)	2.73 ^c (1.65)	2.02 ^c (1.42)	1.81 ^b (1.34)	5.20 (2.28)	3.24 ^{cd} (1.80)	3.12 ^{cd} (1.76)	2.91 ^c (1.68)
3	Cyantranilprole 10.26 w/w OD	90	5.23 (2.28)	1.08 ^{de} (1.03)	0.65 ^{de} (0.80)	0.40 ^d (0.63)	5.86 (2.42)	2.24 ^a (1.47)	2.13 ^{de} (1.45)	1.49 ^d (1.22)
4	Cyantranilprole 10.26 w/w OD	105	5.55 (2.35)	0.93 ^e (0.96)	0.50 ^e (0.70)	0.33 ^d (0.57)	5.71 (2.38)	2.06 ^a (2.28)	1.92 ^a (1.38)	1.28 ^d (1.13)
5	Chlorantranilprole 18.5% SC	40	5.33 (2.30)	5.49 ^{ab} (2.34)	5.03 ^b (2.23)	4.12 ^a (2.02)	4.37 (2.09)	4.26 ^{bc} (2.06)	4.19 ^{bc} (2.00)	4.23 ^b (2.05)
6	Imidacloprid 17.8% SL	25	6.21 (2.49)	1.47 ^d (1.21)	1.08 ^d (1.03)	0.92 ^c (0.95)	5.16 (2.27)	2.28 ^{de} (1.50)	2.01 ^a (1.41)	1.13 ^d (1.06)
7	Spinosad 45% S C	75	5.77 (2.40)	5.39 ^b (2.32)	4.88 ^b (2.66)	4.52 ^a (2.12)	5.56 (2.35)	4.81 ^b (2.19)	4.59 ^b (2.14)	4.57 ^b (2.13)
8	Untreated Control	-	5.00 (2.23)	6.75 ^a (2.57)	7.19 ^a (2.68)	4.28 ^a (2.02)	5.43 (2.26)	6.74 ^a (2.57)	6.56 ^a (2.55)	6.71 ^a (2.58)
	S. Em†		0.36	0.08	0.08	0.10	0.53	0.10	0.10	0.07
	CD at 5%		NS	0.24	0.26	0.30	NS	0.30	0.32	0.21

Figures in the parentheses are square root transformed values.

DAS=Days After Spray

Means that do not share a letter are significantly different.

Table-4 Efficacy of Cyantranilprole 10.26 w/w OD against shoot damage caused by brinjal shoot and fruit borer

	TREATMENTS	DOSE ga.i./ha	I SEASON (% shoot damage/5 plant)				II SEASON (% shoot damage/5 plant)			
			1DBS	3DAS	7DAS	10DAS	1DBS	3DAS	7DAS	10DAS
1	Cyantranilprole 10.26 w/w OD	60	10.23 (18.28)	5.76 ^{bc} (13.88)	3.73 ^c (10.84)	2.67 ^c (9.40)	12.24 (20.47)	8.12 ^{bc} (16.26)	4.78 ^c (12.62)	3.36 ^{bc} (10.21)
2	Cyantranilprole 10.26 w/w OD	75	11.25 (19.59)	5.40 ^c (13.39)	3.10 ^c (10.14)	2.41 ^{cd} (8.93)	11.16 (19.51)	7.68 ^c (16.08)	4.55 ^c (12.11)	3.03 ^b (10.39)
3	Cyantranilprole 10.26 w/w OD	90	10.66 (19.05)	3.68 ^d (11.05)	1.91 ^{de} (7.94)	1.28 ^{ef} (6.49)	11.28 (19.62)	4.41 ^d (12.12)	2.04 ^{de} (8.21)	0.81 ^{ef} (5.16)
4	Cyantranilprole 10.26 w/w OD	105	10.11 (18.53)	3.51 ^d (10.47)	1.56 ^e (7.94)	0.99 ^f (5.71)	12.66 (20.84)	4.08 ^d (11.65)	1.46 ^e (6.94)	0.62 ^f (4.51)
5	Chlorantranilprole 18.5% SC	40	12.34 (20.56)	4.36 ^{cd} (12.05)	2.58 ^{cd} (9.24)	1.66 ^{de} (7.40)	11.81 (20.09)	5.28 ^d (13.28)	2.23 ^{de} (8.43)	1.51 ^{de} (7.05)
6	Imidacloprid 17.8% SL	25	12.33 (20.55)	7.56 ^b (15.95)	7.83 ^b (16.24)	7.39 ^b (15.68)	11.12 (19.47)	10.24 ^{ab} (18.66)	8.44 ^b (16.81)	9.15 ^a (17.60)
7	Spinosad 45% S C	75	11.76 (20.05)	4.56 ^{cd} (12.32)	2.42 ^{cd} (8.94)	1.95 ^{de} (8.02)	10.76 (18.93)	5.11 ^d (13.06)	2.94 ^d (9.87)	1.89 ^{cd} (7.90)
8	Untreated Control	-	11.33 (19.96)	11.73 ^a (19.98)	11.18 ^a (19.52)	10.31 ^a (18.67)	12.33 (20.55)	12.81 ^a (20.93)	11.71 ^a (20.01)	11.49 ^a (19.81)
	S. Em†		2.40	0.71	0.65	0.55	2.36	0.84	0.74	0.79
	CD at 5%		NS	2.14	1.95	1.67	NS	2.54	2.23	2.38

Figures in the parentheses are angular transformed values.

DBS=Days Before Spray, DAS=Days After Spray

Means that do not share a letter are significantly different.

Fruit damage by shoot and fruit borer

Per cent fruit damage caused by shoot and fruit borer varied between 0.89 and 42.04. Significantly lowest damage recorded in plots sprayed with Cyantranilprole 10.26 % @ 105 g a.i./ha (0.89 %) and Cyantranilprole 10.26 % @ 90 g a.i./ha (1.09 %) and were on par with each other. Among the standard checks, Chlorantranilprole 18.5%SC recorded significantly lowest percent damage of 2.10. During season II, lowest per cent damage recorded in Cyantranilprole 10.26 % @ 90 g a.i./ha (0.68 %) and Cyantranilprole 10.26 % @ 105 g a.i./ha (0.80 %). Untreated control recorded significantly highest percent damage (28.16%) [Table-5].

Brinjal marketable yield

Significantly highest marketable yield per hectare was recorded in plots sprayed with Cyantranilprole 10.26 % @ 90 ga.i./ha (49.70 tons) and Cyantranilprole 10.26 % @ 105 g a.i./ha (50.52 tons). Among the standard checks, Chlorantranilprole 18.5%SC recorded significantly higher yield per hectare (51.33 tons) and untreated control recorded significantly lowest yield per hectare (14.55). [Table-5]. The same trend has noticed during season II (2011-12) [Table-6].

Table-5 Impact of Cyantraniliprole 10.26w/w ODon fruit damage caused by shoot and fruit borer

	Treatments	Dose g a.i./ha	Fruit Damage (%)	
			I SEASON	II SEASON
1	Cyantraniliprole 10.26 w/w OD	60	5.57 ^c (13.65)	4.62 ^c (12.41)
2	Cyantraniliprole 10.26 w/w OD	75	5.46 ^c (13.51)	4.12 ^c (11.71)
3	Cyantraniliprole 10.26 w/w OD	90	1.09 ^{ef} (5.99)	0.68 ^e (4.73)
4	Cyantraniliprole 10.26 w/w OD	105	0.89 ^f (5.41)	0.80 ^{de} (5.13)
5	Chlorantraniliprole 18.5% SC	40	2.10 ^{de} (8.33)	1.43 ^{de} (6.86)
6	Imidacloprid 17.8% SL	25	20.88 ^b (27.19)	15.21 ^b (22.95)
7	Spinosad 45%S C	75	2.52 ^d (9.13)	1.93 ^d (7.98)
8	Untreated Control	-	42.04 ^a (40.38)	28.16 ^a (31.89)
	S. Em+		0.84	1.06
	CD at 5%		2.52	3.18

Figures in the parentheses are angular transformed values.

Means that do not share a letter are significantly different.

Table-6 Impact of Cyantraniliprole 10.26 w/w OD on brinjal marketable yield

	Treatments	Dose g a.i./ha	Yield (t/ha)	
			I SEASON	II SEASON
1	Cyantraniliprole 10.26 w/w OD	60	43.56 ^{cd}	41.26 ^c
2	Cyantraniliprole 10.26 w/w OD	75	46.77 ^{bc}	42.13 ^c
3	Cyantraniliprole 10.26 w/w OD	90	49.70 ^{ab}	52.35 ^{ab}
4	Cyantraniliprole 10.26 w/w OD	105	50.52 ^a	54.21 ^a
5	Chlorantraniliprole 18.5% SC	40	42.17 ^d	51.33 ^{ab}
6	Imidacloprid 17.8% SL	25	23.86 ^e	29.13 ^d
7	Spinosad 45%S C	75	42.28 ^d	50.82 ^b
8	Untreated Control	-	14.55 ^f	16.61 ^e
	S. Em+		1.05	1.02
	CD at 5%		3.23	3.20

Discussion

In the present study that the new anthranilic diamide insecticide cyantraniliprole (HGW 86) 10.26% OD @ 90 g a.i./ha may be recommended as an alternative for the management of brinjal insect pest whose efficacy was at par with its higher dose of 105 g a.i./ha. Results of and Misra [8], Patel et al [9] are in agreement with the effectiveness of higher doses of cyantraniliprole 10.26% OD i.e. 90 and 105 g a.i./ha in management thrips, whitefly and brinjal shoot and fruit borer. The efficacy of this chemical to Lepidopteran pest becoming well known [10,11].

The greater fruit yield recorded in cyantraniliprole treated area of present study may be attributed to the anti-feedant effect of cyantraniliprole decreasing leaf and fruit damage. In agreement, cyantraniliprole showed anti-feedant activity [12,13] against a number of insects. Higher marketable fruit yield of brinjal was recorded by Misra [8] with the use of anthranilic diamide insecticide chlorantraniliprole. The cyantraniliprole will raise to selected insecticides for brinjal pest management program. Further, it have different mode of action, by acting on ryanodine receptors and it engraged the insecticide resistance management program.

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Conflict of Interest: None declared

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