International Journal of Tropical Agriculture
Volume 43, Numbers (1-2) • 2025 : pp. 81-89
ISSN: 0254-8755

Field Efficacy of Triflumezopyrim 10.6 SC against the Mixed Populations of Rice Planthoppers in Godavari Delta

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Abstract: A field experiment was conducted at A.P. Rice Research Institute and Regional Agricultural Research Station, Maruteru, West Godavari district during *Kharif* 2013 and 2014 to test the bio-efficacy of triflumezopyrim 10.6 SC at different dosages against planthoppers *viz*., Brown planthoppers and White backed planthoppers in rice. The results revealed that all the dosages of triflumezopyrim 10.6 SC tested *viz.,* 5, 15, 25 and 35 g a.i./ha, were significantly superior in reducing the buildup of planthoppers than treated checks i.e. fipronil 5 SC @ 50 g a.i./ha and buprofezin 25 SC @ 200 g a.i./ha and untreated control in both the seasons up to 28 days after the spray. Among all the dosages, triflumezopyrim 10.6 SC @ 35 g a.i./ha (4625 and 5478 kg/ha), triflumezopyrim 10.6 SC @ 25 g a.i./ha (4594 and 4885 kg/ha) recorded significantly superior grain yields during *Kharif* 2013 and 2014 respectively.

Keywords: *Triflumezopyrim, BPH and WBPH, Field efficacy*.

INTRODUCTION

Rice (*Oryza sativa* L.) is one of the most important cereal crops and serves as a staple food for more than 65 per cent of the global population, providing a livelihood for farmers. India is the second largest producer after China contributing 26 per cent to global production (USDA, 2023). To meet the food demands of an estimated population of 1.6 billion in India by 2050, rice production needs to increase from the current 106 MT of milled rice to 140 MT (FAO, 2015). However, the productivity of rice is threatened by various biotic factors, with insect pests being one of the major constraints. Insect pests not only reduce the yield of rice but also affect its quality, leading to substantial economic losses for farmers globally (Savary *et al*., 2019).

Insects alone cause an average loss of 25-30% in paddy in India (Dhaliwal and Arora, 2010). Insects such as stem borers, gall midge, leaf folders, and plant hoppers can cause substantial yield losses if not managed effectively. Among these insect pests, two planthoppers *viz.,* Brown planthoppers (BPH), *Nilaparvata lugens* (Stal) and White backed planthopper (WBPH), *Sogatella furcifera* (Horvath) (Fam: Delphacidae, Order: Hemiptera) emerged as a major pest and BPH alone causes a yield loss ranged from 20-80 per cent (Min *et al.,* 2014). These two planthoppers have been one of the major pests of rice in Godavari delta of Andhra Pradesh (Krishnaiah *et al*., 2006).

In recent years, with the indiscriminate use of insecticides, resurgence and resistance appeared as a major problem in planthopper management (Prakash *et al*., 2014). Among the various IPM strategies

Article History: Received: 09 March 2025; Revised: 05 April 2025; Accepted: 18 April 2025; Published: 30 June 2025

adopted to combat rice planthoppers, till chemical control was the first line of defence and will likely to continue to remain as the important strategy in near future. Under such circumstances, several new molecules with selective toxicity against target pests, reduced environmental impact, and lower risk of resistance development are required to be evaluated for the justification of chemical control as sustainable pest management in rice cultivation. Triflumezopyrim belonging to mesoionic class is an effective insecticide against planthoppers with no harmful effects on non-target organisms targets the nicotine acetylcholine receptors (Caleb *et al*., 2015 and Cordova *et al*. (2016). Hence, the present study was carried out to test the efficacy of triflumezopyrim against planthoppers of rice.

MATERIALS AND METHODS

Field experiments were carried out during *Kharif* 2013 and 2014 at A.P. Rice Research Institute and Regional Agricultural Research Station, Maruteru, Andhra Pradesh. The experiment was laid out in a randomized block design (RBD) with seven treatments and each treatment were replicated thrice. The plot size of 20 m^2 were separated from each other so as to prevent water movement from one plot to another. Swarna (MTU 7029), a popular high yielding planthoppers susceptible variety was used for the present study and crop was raised by duly following all recommended agronomic practices for the area. The test insecticides (table 1) were applied as foliar spray with a knapsack sprayer @ 500 litres spray fluid / hectare at an appropriate stage based on the planthoppers build-up.

All the treatments were imposed once at 65 DAT during *Kharif* 2013 and twice during *Kharif* 2014 at 50 and 85 DAT. During *Kharif* 2013 and 2014 the data on planthopper numbers (BPH and WBPH) and natural enemies *viz*., spiders and green mirid bugs were recorded on 10 randomly marked hills from each plot at one day before, three, seven, 10, 14, 21 and 28 days after the first spray and at three, 10 and 21 days after the second spray during *Kharif* 2014. The data on % Hopper burn area was also recorded before harvest. The grain yields were recorded from each net plot at the time of harvest and presented as kilogram per hectare. The data on planthoppers, and mirid bugs were transformed to square root values and the per cent Hopper burn area was transformed to arc-sine values and subjected to statistical analysis (Gomez and Gomez, 1984).

Table 1: Details of the insecticide treatments

Treatment No.	*Particulars of the treatments*	*Dose (g a.i./ha)*
1.	Triflumezopyrim 10.6 SC	5
2.	Triflumezopyrim 10.6 SC	15
3.	Triflumezopyrim 10.6 SC	25
4.	Triflumezopyrim 10.6 SC	35
5.	Fipronil 5 SC	50
6	Buprofezin 25 SC	200
7	Untreated control	---

RESULTS AND DISCUSSION

Planthoppers (BPH and WBPH)

During *Kharif* 2013, the results showed that there was a significant difference among the treatments before imposition of insecticide treatments indicating that the populations not distributed uniformly between the treatments (table 2). The differences in planthopper numbers/10 hills after imposition of treatments were significant among the treatments at all the observations recorded. At three days after the spray, triflumezopyrim 10.6 SC at all the dosages i.e. @ 5 g a.i./ha (30.67), 35 g a.i./ha (36.00), 25 g a.i./ha (36.67) and 15 g a.i./ha (46.33) were significantly superior and recorded lowest numbers of planthoppers per 10 hills. These were followed by check insecticides, buprofezin 25 SC @ 200 g a.i./ha (207.67 hoppers/10 hills) and fipronil 5 SC @ 50 g a.i./ha (266.00 hoppers/10 hills). Highest number of planthoppers population was recorded in untreated control (548.67).

At seven days after the spray also all the insecticide treatments were significantly superior in reducing the buildup of planthoppers and recorded lower number of planthoppers/10 hills (ranged from 34.33 to 431.00) than untreated control (1500.00). Triflumezopyrim 10.6 SC @ 25 g a.i./ha (34.33) and triflumezopyrim 10.6 SC @ 35 g a.i./ha (68.33) recorded significantly lowest numbers of planthoppers and were followed by other dosages of triflumezopyrim 10.6 SC and check insecticides. At 10, 14, 21 and 28 days after the spray also all the dosages of triflumezopyrim 10.6 SC were significantly superior in reducing the buildup of planthoppers than the treated checks and untreated control. The populations of planthoppers were increased after 21 days of spray even in check insecticides but not in triflumezopyrim 10.6 SC treatments indicating that its toxicity persists up to 28 days. All the dosages of triflumezopyrim 10.6 SC not recorded any Hopper burn area but it was observed in check insecticides and untreated control plots (18.67 to 23.28%).

During *Kharif* 2014 before imposition of the insecticide treatments the populations of planthoppers was uniformly distributed between the treatments and were ranged from 243.33 to 383.00 hoppers/10 hills). After first spray, the differences in planthopper numbers/10 hills among the treatments were significant at three, seven, 10, 14, 21 and 28 days after spray (table 3). At three days after spray, triflumezopyrim 10.6 SC @ 35 g a.i./ha recorded significantly lowest numbers of planthoppers per 10 hills (22.67) and on par with fipronil 5 SC @ 50 g a.i./ha (33.00), triflumezopyrim 10.6 SC @ 15 g a.i./ha (35.33) and triflumezopyrim 10.6 SC @ 25 g a.i./ha (37.33). At seven days after first spray, triflumezopyrim 10.6 SC @ 35 g a.i./ha recorded significantly lowest numbers of planthoppers (8.33) and on par with fipronil 5 SC @ 50 g a.i./ha (14.33), triflumezopyrim 10.6 SC @ 15 g a.i./ha (18.67). The next best treatment was triflumezopyrim 10.6 SC @ 25 g a.i./ha (20.00). At 10, 14, 21 and 28 days after first spray also, triflumezopyrim 10.6 SC @ 35 and 25 g a.i./ha were significantly superior in reducing the buildup of planthoppers and recorded lower number of planthoppers/20 hills than the treated checks and untreated control.

The second spray during *Kharif* 2014 was given at 85 DAT. Before 2nd spray, the differences in planthopper numbers among the treatments were significant. Among the treatments, triflumezopyrim 10.6 SC @ 35 and 25 g a.i./ha recorded significantly lower number of planthoppers at 3, 10 days after the spray. At 21 days after spray, planthoppers were naturally declined and their numbers were very low in all the treatments and on par with each other except in buprofezin 25 Sc @ 200 g a.i./ha and untreated control (table 4). The differences in per cent Hopper burn area were significant among the treatments. The higher dosages of triflumezopyrim 10.6 SC (15, 25 and 35 g a.i. /ha) along with fipronil 5 SC @ 50 g a.i./ha not recorded Hopper burn area but it was observed in triflumezopyrim 10.6 SC @ 5 g a.i./ha (4.48%), buprofezin 25 SC @ 200 g a.i./ha (2.49%) and untreated control plots (29.26%).

In the present investigation, triflumezopyrim 10.6 SC @ 35 and 25 g a.i./ha effectively managed the build-up of planthoppers and recorded higher grain yields. These findings were in agreement with the previous reports of Ranjith Kumar *et al*. (2017), who reported that triflumezopyrim 10.6 SC @ 237 ml ha-1 was effective against planthoppers in Gangavathi. Shelke *et al*. (2025) also reported the effectiveness of triflumezopyrim 10.6 SG @ 0.5 ml/L against BPH. Similarly, Guruprasad et al. 2016 also reported that triflumezopyrim @ 25 and 35 g a.i./ha found to be effective in reducing the plant hoppers population and realizing higher grain yield.

Natural enemies

Spiders

During *Kharif* 2013, the differences in spider numbers were not significant among the treatments at all the observations recorded (table 5). Whereas, during *Kharif* 2014, the differences in spider numbers were not significant among the treatments before and three days after the 1st spray. At five and seven days after the 1st spray, triflumezopyrim 10.6 SC @ 5 g a.i./ha and buprofezin 25 SC @ 200 g a.i./ha treated plots along with the untreated control recorded significantly higher numbers of spiders/10 hills than other dosages of triflumezopyrim 10.6 SC. At ten days after the 1st spray, the spider populations were very low in all the treatments and their number again increased by 15 days after spray. At 15 days after spray, buprofezin 25 SC @ 200 g a.i./ha and triflumezopyrim 10.6 SC @ 5 g a.i./ha treated plots along with the untreated control recorded significantly higher numbers of spiders/10 hills than other treatments (table 6).

During 2nd spray the spider numbers were significant before the spray and ten days after spray. Before the spray significantly highest numbers of spiders/10 hills were observed in untreated control (25.67) and on par with triflumezopyrim 10.6 SC @ 5 g a.i./ha (22.00) and were followed by other treatments except triflumezopyrim 10.6 SC @ 35 g a.i./ha. At ten days after spray, buprofezin 25 SC @ 200 g a.i./ha (20.33) and untreated control (20.67) recorded significantly higher numbers of spiders and closely followed by fipronil 5 SC @ 50 g a.i./ha (15.33) and triflumezopyrim 10.6 SC @ 5 g a.i./ha (14.67) (table 6). The highest numbers in those treatments were mainly because of highest prey numbers as the predators were density dependant.

Green mirid bugs (*Cyrtorhinus lividipennis*)

During *Kharif* 2013, populations of green mirid bugs were observed from 70 DAT. The differences in mirid bug numbers among the treatments were significant at all the observations recorded. At seven days after the spray, among the treatments, significantly highest numbers per 10 hills were observed in untreated control (18.33) and followed by other insecticide treatments. At ten days after the spray also untreated control recorded significantly highest numbers/10 hills (33.67) and followed by buprofezin 25 SC (12.33) and fipronil 5 SC (9.00). At 14 days after the spray also, untreated control (13.00) recorded significantly highest numbers. At 21 and 28 days after the spray buprofezin 25 SC @ 200 g a.i./ha recorded significantly highest numbers and followed by untreated control (table 5). The highest numbers in those treatments were mainly because of highest prey numbers as the predators were density dependant.

During *Kharif* 2014, populations of mirid bugs were observed at 28 days after 1st spray (75 DAT) and the differences among the treatments were significant. Among the treatments, untreated control recorded significantly highest numbers of green mirid bugs/10 hills (50.33) and on par with triflumezopyrim 10.6 SC @ 5 g a.i./ha (46.33). These were followed by buprofezin 25 SC @ 200 g a.i./ha (27.00) and fipronil 5 SC @ 50 g a.i./ha (14.00). While, the other dosages of triflumezopyrim 10.6 SC recorded significantly lowest numbers. This might be because of lowest prey (planthopper) numbers in those plots. At three and ten days after the second spray, untreated control and buprofezin 25 SC @ 200 g a.i./ha recorded significantly highest numbers of mirid bugs than other treatments. At 21 days after spray, the differences among the treatments in mirid bug numbers were not significant (table 7).

The results of the present findings were in agreement with the finding of Mohapatra et al. (2022), who reported that triflumezopyrim 10 SC alone @ 25 g a.i./ha and in combination with spinetoram 12% (22%) WDG @ 55 g a.i./ha was found to be safe to the predatory mirid

Table 2: Comparative efficacy of triflumezopyrim 10.6 SC on the incidence of planthoppers during *Kharif* 2013

Tr. No.	*Planthopper numbers/10 hills***							*% hopper burn area**	*Grain yield (kg/ha)*
	BS	*3 DAS*	*7 DAS*	*10 DAS*	*14 DAS*	*21 DAS*	*28 DAS*		
1	561.00 (23.42)	30.67 (5.38)	222.00 (14.87)	46.67 (6.71)	19.00 (4.35)	17.33 (3.89)	55.00 (6.99)	0.025 (0.91)	4476
2	735.00 (27. 07)	46.33 (6.58)	267.00 (16.31)	52.33 (7.19)	31.00 (5.35)	13.67 (3.57)	30.33 (5.25)	0.025 (0.91)	4352
3	852.33 (29.04)	36.67 (5.98)	34.33 (5.80)	26.83 (5.00)	18.33 (4.16)	9.33 (2.86)	27.67 (5.20)	0.025 (0.91)	4594
4	475.00 (21.74)	36.00 (5.74)	68.33 (8.26)	13.67 (3.69)	19.67 (4.43)	3.33 (1.80)	16.33 (4.00)	0.025 (0.91)	4625
5	1061.67 (32.41)	266.00 (16.23)	362.67 (19.02)	274.67 (16.42)	47.33 (6.76)	132.67 (11.46)	453.67 (21.01)	18.67 (25.57)	4384
6	758.67 (27.49)	207.67 (14.41)	363.33 (18.15)	431.00 (20.68)	126.00 (10.92)	186.33 (13.18)	1878.33 (43.01)	18.67 (25.57)	3197
7	811.67 (28.41)	548.67 (22.69)	1500.00 (38.45)	1306.67 (35.82)	202.33 (14.20)	193.00 (13.67)	1990.00 (44.05)	23.28 (28.68)	2651
F test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig
C.D. (0.05)	5.69	9.84	6.14	4.93	2.63	4.34	7.86	3.76	483
CV (%)	11.81	28.04	19.99	20.31	20.62	33.83	23.88	17.75	6.73

**=Figures in parenthesis are square root transformed values
BS= before spray, DAS= Days after spray

Table 3. Comparative efficacy of triflumezopyrim 10.6 SC on the incidence of planthoppers during 1st spray in *Kharif* 2014

Tr. No.	Planthopper numbers/10 hills**						
	BS	3 DAS	7 DAS	10 DAS	14 DAS	21 DAS	28 DAS
1	400.00 (19.99)	67.33 (8.19)	87.00 (9.32)	175.33 (13.14)	581.67 (23.99	508.00 (22.54)	1811.00 (42.38)
2	383.33 (18.78)	35.33 (5.66)	18.67 (4.21)	90.00 (9.49)	65.67 (8.08)	80.33 (8.93)	110.00 (10.48)
3	300.00 (17.03)	37.33 (6.05)	20.00 (4.28)	19.00 (4.20)	25.67 (5.06)	26.00 (5.10)	24.67 (4.94)
4	320.00 (17.79)	22.67 (4.74)	8.33 (2.82)	19.33 (4.30)	8.33 (2.78)	22.67 (4.70)	18.67 (4.11)
5	380.00 (19.30)	33.00 (5.71)	14.33 (3.78)	84.33 (9.18)	96.67 (9.76)	115.33 (10.74)	185.33 (13.39)
6	356.67 (18.73)	34.33 (5.82)	36.00 (5.96)	92.00 (9.58)	290.00 (16.99)	87.67 (9.35)	1204.67 (34.56)
7	243.33 (15.38)	85.67 (9.24)	91.33 (9.55)	280.00 (16.62)	539.00 (23.09)	1297.00 (35.91)	2151.00 (46.28)
F test	NS	Sig	Sig	Sig	Sig	Sig	Sig
C.D. (0.05)	-	1.65	1.44	4.07	2.82	2.28	4.98
CV (%)	12.31	14.27	14.16	14.56	12.66	9.22	12.95

**=Figures in parenthesis are square root transformed values
BS= before spray, DAS= Days after spray

Table 4: Comparative efficacy of triflumezopyrim 10.6 SC on the incidence of planthoppers during 2nd spray in *Kharif* 2014

Tr. No.	Planthopper numbers/10 hills**				% hopper burn area*	Grain yield (kg/ha)
	BS	3 DAS	10 DAS	21 DAS		
1	4363.33 (65.89)	409.00 (20.17)	133.33 (11.45)	25.33 (4.94)	4.48 (11.68)	4050
2	211.67 (14.47)	165.67 (12.86)	90.67 (9.54)	21.00 (4.48)	0.025 (0.91)	4795
3	36.33 (6.01)	34.00 (5.75)	20.33 (4.34)	19.67 (4.16)	0.025 (0.91)	4885
4	35.67 (5.53)	20.33 (4.36)	21.33 (4.22)	18.67 (4.22)	0.025 (0.91)	5478
5	859.00 (29.16)	652.00 (25.43)	123.67 (10.58)	16.33 (3.98)	0.025 (0.91)	5393
6	2793.00 (52.74)	781.67 (27.88)	239.33 (15.28)	82.00 (8.77)	2.49 (7.72)	3849
7	4856.67 (69.68)	2673.33 (51.63)	487.33 (22.04)	58.67 (7.61)	29.26 (32.65)	2737
F test	Sig	Sig	Sig	Sig	Sig	Sig
C.D. (0.05)	4.74	4.12	4.56	2.93	6.03	753
CV (%)	7.66	10.83	23.16	30.21	42.63	9.5

**=Figures in parenthesis are square root transformed values

*=Figures in parenthesis are arc-sine transformed values

BS= before spray, DAS= Days after spray

Table 5: Effect of triflumezopyrim 10.6 SC on the incidence of natural enemies during *kharif* 2013

Tr. No.	Spider numbers/10 hills							Green mirid bugs/10 hills				
	BS	3 DAS	7 DAS	10 DAS	14 DAS	21 DAS	28 DAS	7 DAS	10 DAS	14 DAS	21 DAS	28 DAS**
1	4.33	5.67	8.00	11.67	11.67	11.33	16.00	6.67	2.00	1.33	8.33	45.33 (6.72)
2	4.33	4.33	7.67	7.00	8.67	7.00	13.67	10.00	2.00	2.67	6.33	42.67 (6.51)
3	4.00	6.33	6.33	6.33	12.67	11.33	13.33	5.00	2.33	1.67	1.67	39.33 (6.25)
4	3.33	6.00	5.33	7.67	7.33	11.67	13.33	7.67	0.67	0.00	2.67	27.67 (5.43)
5	5.00	6.33	7.33	10.33	11.00	12.00	18.00	6.33	9.00	4.00	9.00	56.67 (7.41)
6	3.33	7.33	9.67	13.67	11.67	12.67	22.67	6.67	12.33	6.00	35.00	170.00 (12.80)
7	4.33	9.67	9.33	13.33	11.33	9.67	19.00	18.33	33.67	13.00	22.00	115.67 (10.62)
F test	NS	NS	NS	NS	NS	NS	NS	Sig	Sig	Sig	Sig	Sig
C.D. (0.05)	---	---	---	---	---	---	---	4.18	2.96	3.30	11.31	2.96
CV (%)	46.35	28.83	28.00	28.87	28.65	32.21	23.00	27.14	18.19	45.32	52.35	20.91

**=Figures in parenthesis are square root transformed values; BS= before spray, DAS= Days after spray

Table 6: Effect of triflumezopyrim 10.6 SC on the incidence of Spiders during *Kharif* 2014

Tr. No.	***Spider numbers/10 hills***										
	1st spray							***2nd spray***			
	BS	***3 DAS***	***7 DAS***	***10 DAS***	***14 DAS***	***21 DAS***	***28 DAS***	***BS***	***3 DAS***	***10 DAS***	*21 DAS*
1.	7.33	12.00	7.67	12.33	14.67	2.67	17.00	22.00	28.00	14.67	10.67
2.	2.67	14.00	5.67	7.67	6.67	1.33	7.33	15.00	21.33	11.33	11.67
3.	6.67	8.33	4.67	9.00	6.67	2.67	6.67	19.33	11.00	8.33	12.00
4.	6.00	12.67	4.00	8.33	7.33	1.33	10.33	14.33	10.67	14.00	8.00
5.	6.00	9.67	3.33	8.33	10.00	0.67	13.67	16.67	22.33	15.33	9.00
6	7.00	12.67	6.00	13.00	13.00	1.00	20.00	19.00	26.33	20.33	16.67
7	3.33	13.33	9.33	10.00	9.33	1.33	19.00	25.67	29.67	20.67	12.00
F test	NS	NS	Sig	Sig	Sig	Sig	Sig	Sig	NS	Sig	NS
C.D. (0.05)	-	-	3.48	3.60	5.21	1.29	5.96	4.38	-	6.14	-
CV (%)	42.30	20.21	32.99	32.99	30.30	46.05	24.95	13.05	40.25	23.07	40.23

BS= before spray, DAS= Days after spray

Table 7: Effect of triflumezopyrim 10.6 SC on the incidence of green mirid bugs during *Kharif* 2014

Tr. No.	*green mirid bug numbers/10 hills***				
	1st spray	*2nd spray*			
	28 DAS	*BS*	*3 DAS*	*10 DAS*	*21 DAS*
1.	46.33	147.33 (11.70)	101.00 (9.55)	167.33 (12.93)	54.00 (7.28)
2.	1.00	14.67 (3.75)	20.00 (4.38)	57.33 (7.46)	51.33 (6.79)
3.	1.67	2.00 (1.14)	22.67 (4.52	38.33 (6.11)	61.00 (7.52)
4.	7.00	3.67 (1.47)	19.33 (4.11)	40.00 (6.30)	36.00 (5.90)
5.	14.00	55.67 (7.43)	138.33 (11.17)	159.33 (12.53)	59.38 (761)
6	27.00	134.00 (11.45)	228.67 (15.07)	273.33 (16.39)	187.00 (12.96)
7	50.33	171.00 (12.98)	376.00 (19.24)	322.33 (17.85)	101.00 (9.93)
F test	Sig	Sig	Sig	Sig	NS
C.D. (0.05)	16.86	3.60	4.29	2.28	-
CV (%)	45.04	28.40	24.83	8.37	35.14

**=Figures in parenthesis are square root transformed values
BS= before spray, DAS= Days after spray

bug, *Cyrtorhinus lividipennis* and wolf spider, *Pardosa pseudoannulata* in rice ecosystem. Randhawa et al. (2022) also reported the safety of triflumezopyrim 10 SC against spiders.

Grain yield

During *Kharif* 2013, differences in grain yield between the treatments were significant. Among the treatments, triflumezopyrim 10.6 SC @ 35 g a.i./ha (4625 kg/ha), triflumezopyrim 10.6 SC @ 25 g a.i./ha (4594 kg/ha), triflumezopyrim 10.6 SC @ 5 g a.i./ha (4476 kg/ha), fipronil 5 SC @ 50 g a.i./ha (4384 kg/ha) and triflumezopyrim 10.6 SC @ 15 g a.i./ha (4352 kg/ha) recorded significantly superior grain yields and on par with each other. These were followed by buprofezin 25 SC @ 200 g a.i. /ha (3197 kg/ha). Untreated control recorded significantly lowest yield (2651 kg/ha) than other treatments (table 2).

During *Kharif* 2014, differences in grain yield between the treatments were significant. Among the treatments, triflumezopyrim 10.6 SC @ 35 g a.i./ha (5477 kg/ha) recorded significantly superior grain yields and on par with triflumezopyrim 10.6 SC @ 25 g a.i./ ha (4885 kg/ha). These were followed by triflumezopyrim 10.6 SC @ fipronil 5 SC @ 50 g a.i./ha (4104 kg/ha), triflumezopyrim 10.6 SC @ 15 g a.i./ha (4051 kg/ha) and 5 g a.i./ha (3950 kg/ha) and buprofezin 25 SC @ 200 g a.i. /ha (3849 kg/ha). Untreated control recorded significantly lowest yield (2737 kg/ha) than other treatments (table 4).

CONCLUSIONS

Rice cultivating farmers of Godavari Districts, Andhra Pradesh are facing a serious challenge as the crop is vulnerable to attack from planthoppers as a major pest, causing significant losses in yield. After noticing the development of planthoppers resistance to the neonicotinoid insecticides the farmers face the difficulty in management of hoppers. It is evident from the present experiment that, triflumezopyrim 10.6 SC a new insecticide molecule @ 25 g a.i./ha and 35 g a.i./ha to be used for the effective management of planthoppers in rice ecosystem and to obtain higher grain yield.

ACKNOWLEDGEMENT

Authors are grateful to M/S E. I DuPont India Pvt Ltd. for providing insecticide sample to carried out the research. Thanks, are also extending to the Director of Research, ANGRAU, Hyderabad and Associate Director of Research, RARS, Maruteru for providing necessary facilities for conducting the experiment.

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