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EFFICACY OF READY MIXTURE OF BETA-CYFLUTHRIN 9% + IMIDACLOPRID 21% - 300 OD AGAINST INSECT PESTS IN CHICK PEA, *CICER ARIETINUM* L.

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ABSTRACT

Experiments on efficacy of ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD and sole insecticides against pod borer (*Helicoverpa armigera* Hubner) and aphid in chick pea was conducted during Rabi 2007 and 2008 at R.C.A. Udaipur. Spray of Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha at 10 days interval found significantly superior to imidacloprid 200 SL at 210 ml/ha Monocrotophos 36SL at 1250 ml/ha, Triazophos 40EC at 1000 ml/ha Endosulfan 35EC at 1250 ml/ha and tank mixture of Lamdacyhalothrin 5% EC + Thiamethoxam 25WG (Tank Mixture) at 312.5 ml + 125 g ha against pod borer and aphid infestation in chickpea. It also yielded significantly higher seed yield of 16.85 and 16.92 q/ha during 2007-08 and 2008-09, respectively.

Key words: ready mixture, Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD

Chick pea, *Cicer arietinum* L is one of the most important pulse crops of India and considered as " King of pulses". It is ravaged by number of insect pests throughout its growth stage which limits the production of chick pea. The pod borer, *Helicoverpa armigera* Hubner is a predominant species causing economic damage to chick pea. Besides, the crop is also attacked by aphid, *Acyrthosiphum pisum* Harr. and *Aphis craccivora* Koch, which also causes losses to this crop. A number of chemical insecticides have been reported to be effective in chick pea (Khurana, 1996 and Dhingara *et al.,* 2003). The indiscriminate use of the insecticides (organophosphates, carbamates and synthetic pyrethroids) has created number of well known problems. Hence, there is a need to use newer insecticides which are selective and are effective at lower doses. Recently, number of ready mix mixture of insecticides are available which are effective against number of insect pests. No work has so far been done on the efficacy of ready mixture of insecticides which are effective against insects with different feeding/ damaging habits. Therefore, efforts have been made to find out comparative efficacy of ready mixture, Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD, tank mix mixture of insecticides and sole application of insecticides against pod borer and aphid in chickpea .

MATERIALS AND METHODS

The experiment on the bio-efficacy of Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at the rate of 150,175 and 200ml/ha, along with Beta-cyfluthrin 2.5% SC@ 720ml, Imidacloprid 200SL@ 210ml, tank Mixture of Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG @312.5 ml+125g, Monocrotophos 36SL@1250ml, Triazophos 40 EC@1000 ml and Endosulfan 35EC@1250 ml/ha against aphid and early infestation of *H. armigera* in chick pea was conducted at Rajasthan College of Agriculture, Udaipur during *Rabi* 2007-08 and 2008-09.

The experiment was conducted in RBD with ten treatments replicated four times. Chick pea variety Dohad yellow was sown on 28 Oct. and 3 Nov. during 2007 and 2008, respectively. Sowing was done in plots each measuring 4.5 x 4.2 sq meter at row to row spacing of 30cm. Each treatment was applied three times at an interval of 10 days initiating first spray at the appearance of the pest.

The observations on the population of aphid and pod borer larvae were recorded one day before and 3, 5 and 7days after each spray on 10plants/plot selected randomly. The mean reduction in population of aphid & pod borer larvae was calculated at 3, 5 & 7 days after each spray. The data were then subjected to statistical. The percent damaged pods for each treatment was calculated by counting total number of pods and number of damaged pods on five plants selected randomly at harvest. The seed yield of Chickpea was recorded separately for each treatment and yield per hectare was calculated.

RESULTS AND DISCUSSION

Aphid : The data presented in Table 1-2 reveals that all the treatments were found significantly superior over control. The data recorded on mean reduction in the

Table 1. Efficacy of Beta-Cyfluthrin 9% + Imidacloprid 21% 300 OD against aphids in chickpea (2007)

S. No.	Treatments	First spray			Second spray			Third spray		
		3 days	5 days	7 days	3 days	5 days	7 days	3 days	5 days	7 days
1.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 150 ml/ha	44.27 (48.72)*	41.05 (43.13)	36.68 (36.69)	49.52 (57.86)	43.96 (48.18)	40.77 (42.64)	52.76 (63.38)	49.15 (57.21)	44.99 (49.98)
2.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 175 ml/ha	48.69 (56.42)	47.76 (54.81)	44.72 (49.52)	56.39 (69.36)	53.08 (63.92)	50.61 (59.73)	65.31 (82.55)	63.38 (79.92)	61.28 (76.91)
3.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha	53.85 (65.21)	49.81 (58.36)	46.40 (52.44)	61.23 (76.83)	56.72 (69.89)	54.00 (64.45)	74.05 (92.45)	71.15 (89.56)	66.30 (83.84)
4.	Beta-cyfluthrin 2.5% SC at 720 ml/ha	34.74 (32.47)	33.37 (30.25)	31.86 (27.89)	36.56 (35.48)	34.84 (32.63)	33.69 (30.77)	37.76 (37.49)	35.63 (33.93)	34.23 (31.64)
5.	Imidacloprid 200SL at 210 ml/ha	46.38 (52.40)	43.68 (47.70)	42.59 (45.80)	54.01 (65.47)	51.77 (61.71)	48.12 (55.43)	59.80 (74.70)	56.04 (68.80)	52.79 (63.43)
6.	Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG (Tank Mixture) at 312.5ml +125 g	44.51 (49.15)	42.35 (45.37)	38.71 (39.11)	48.60 (56.27)	46.53 (52.68)	43.96 (48.19)	56.50 (69.54)	54.26 (65.91)	51.29 (60.88)
7.	Monocrotophos 36SL at1250 ml/ha	41.76 (44.36)	39.10 (39.78)	36.51 (35.40)	44.09 (48.41)	41.32 (43.60)	39.14 (39.84)	50.35 (59.28)	47.66 (54.63)	45.22 (50.38)
8.	Triazophos 40 EC at1000 ml/ha	45.93 (51.62)	44.27 (48.72)	42.62 (45.84)	50.58 (59.67)	47.71 (54.72)	46.09 (51.91)	59.90 (74.85)	56.96 (70.27)	53.54 (64.69)
9.	Endosulfan 35EC at1250 ml/ha	45.52 (50.90)	43.77 (47.86)	41.33 (43.61)	48.94 (56.65)	46.61 (52.81)	44.66 (49.40)	58.19 (72.21)	55.86 (68.50)	51.58 (61.39)
10.	Untreated Control (Water spray)	-	-	-	-	-	-	-	-	-
	S.Em ±	0.79	0.74	0.75	0.99	0.87	0.79	1.51	1.32	1.18
	C.D. at 5%	2.29	2.13	2.20	2.88	2.52	2.33	4.39	3.82	3.43

* Values in parenthesis are retransformed per cent value

Table 2. Efficacy of Beta-cyfluthrin 9% + Imidacloprid 21% 300 OD against aphids in chickpea (2008)

S. No.	Treatments	First spray			Second spray			Third spray		
		3 days	5 days	7 days	3 days	5 days	7 days	3 days	5 days	7 days
1.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 150 ml/ha	43.73 (47.78)*	40.74 (42.59)	37.40 (36.89)	50.03 (58.73)	46.09 (51.90)	41.42 (43.77)	53.66 (64.89)	48.64 (56.33)	44.99 (49.98)
2.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 175 ml/ha	48.27 (55.70)	47.09 (53.64)	44.40 (48.95)	57.09 (70.49)	54.25 (65.87)	50.03 (58.73)	68.02 (85.99)	63.65 (80.30)	62.34 (78.45)
3.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha	55.63 (64.84)	51.47 (61.20)	46.83 (53.18)	63.66 (80.31)	58.40 (72.54)	54.30 (65.94)	76.64 (94.57)	69.29 (87.50)	66.53 (84.14)
4.	Beta-cyfluthrin 2.5% SC at 720 ml/ha	35.77 (34.17)	34.01 (31.29)	31.65 (27.84)	38.29 (38.39)	34.79 (32.56)	33.18 (29.95)	41.49 (43.89)	37.25 (36.63)	33.61 (30.64)
5.	Imidacloprid 200SL at 210 ml/ha	47.81 (54.90)	44.40 (48.96)	41.49 (43.89)	53.99 (65.43)	51.04 (60.47)	47.75 (54.79)	63.18 (79.64)	59.94 (74.91)	56.08 (68.87)
6.	Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG (Tank Mixture) at 312.5ml +125 g	44.23 (48.65)	42.07 (44.89)	38.47 (38.71)	50.14 (58.93)	47.82 (54.91)	45.36 (50.63)	57.14 (70.56)	52.99 (63.77)	51.43 (61.13)
7.	Monocrotophos 36SL at1250 ml/ha	42.54 (45.72)	39.14 (39.85)	36.98 (36.18)	48.04 (55.30)	44.08 (48.40)	40.94 (42.94)	52.52 (62.98)	48.82 (56.65)	44.97 (49.95)
8.	Triazophos 40 EC at1000 ml/ha	45.06 (50.10)	43.26 (46.97)	41.04 (43.12)	51.31 (60.93)	48.39 (55.90)	46.65 (52.87)	58.92 (73.34)	51.41 (61.10)	49.29 (57.45)
9.	Endosulfan 35EC at1250 ml/ha	45.41 (50.72)	42.43 (45.52)	40.85 (42.78)	51.56 (61.34)	47.82 (54.92)	45.53 (50.92)	56.72 (69.88)	50.05 (58.77)	47.40 (54.19)
10.	Untreated Control (Water spray)	-	-	-	-	-	-	-	-	-
	S.Em ±	0.79	0.73	0.73	1.02	0.96	0.80	1.47	1.23	1.10
	C.D. at 5%	2.28	2.11	2.12	3.00	2.78	2.33	4.26	3.56	3.25

* Values in parenthesis are retransformed per cent value

Table 3. Efficacy of Beta-cyfluthrin 9% + Imidacloprid 21% 300 OD against pod borer, *H. armigera* in chickpea (2007)

S. No.	Treatments	First spray			Second spray			Third spray		
		3 days	5 days	7 days	3 days	5 days	7 days	3 days	5 days	7 days
1.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 150 ml/ha	42.44 (45.55)*	40.11 (41.51)	36.80 (35.89)	46.49 (52.60)	43.71 (47.76)	40.91 (42.89)	51.63 (61.47)	49.47 (57.76)	40.62 (52.83)
2.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 175 ml/ha	46.51 (52.64)	45.06 (50.10)	43.73 (47.78)	52.45 (62.85)	49.42 (57.69)	47.26 (53.94)	62.67 (78.91)	61.29 (76.92)	59.66 (74.49)
3.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha	53.09 (63.93)	49.69 (58.15)	46.64 (52.86)	59.96 (74.94)	54.25 (65.86)	51.21 (60.75)	70.94 (89.33)	67.32 (85.13)	63.66 (80.31)
4.	Beta-cyfluthrin 2.5% SC at 720 ml/ha	45.21 (50.37)	42.65 (45.90)	40.01 (41.34)	50.65 (59.80)	48.24 (55.64)	46.25 (52.18)	56.60 (69.69)	53.94 (65.35)	52.49 (62.93)
5.	Imidacloprid 200SL at 210 ml/ha	39.33 (40.17)	36.18 (34.85)	33.29 (30.13)	40.68 (42.48)	36.70 (35.71)	34.84 (32.63)	41.92 (44.64)	38.16 (38.17)	35.65 (33.97)
6.	Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG (Tank Mixture) at 312.5ml +125 g	42.93 (46.39)	40.91 (42.89)	38.51 (38.77)	47.12 (53.70)	45.40 (50.70)	43.96 (48.18)	56.15 (68.97)	53.68 (64.92)	52.43 (62.82)
7.	Monocrotophos 36SL at1250 ml/ha	40.60 (42.35)	37.55 (37.14)	36.04 (34.61)	44.79 (49.64)	41.91 (44.61)	40.02 (41.36)	50.02 (58.72)	47.24 (53.90)	45.49 (50.86)
8.	Triazophos 40 EC at1000 ml/ha	44.06 (48.36)	41.05 (43.13)	39.09 (39.76)	48.30 (55.74)	46.19 (52.07)	45.55 (50.95)	54.29 (65.92)	51.86 (61.86)	50.00 (58.69)
9.	Endosulfan 35EC at1250 ml/ha	43.38 (47.18)	40.95 (42.95)	39.31 (40.14)	49.44 (57.71)	47.16 (53.76)	45.68 (51.18)	55.38 (67.72)	52.58 (64.75)	51.58 (61.39)
10.	Untreated Control (Water spray)	-	-	-	-	-	-	-	-	-
	S.Em ±	0.75	0.69	0.63	0.89	0.80	0.75	1.26	1.10	1.16
	C.D. at 5%	2.17	2.00	1.82	2.59	2.31	2.17	3.65	3.20	3.38

* Values in parenthesis are retransformed per cent value

Table 4. Efficacy of Beta-cyfluthrin 9% + Imidacloprid 21% 300 OD against pod borer *H. armigera* in chickpea (2008)

S. No.	Treatments	First spray			Second spray			Third spray		
		3 days	5 days	7 days	3 days	5 days	7 days	3 days	5 days	7 days
1.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 150 ml/ha	44.37 (48.90)*	41.35 (43.64)	40.26 (41.77)	49.53 (57.87)	47.71 (54.73)	46.11 (51.94)	53.14 (64.01)	50.77 (60.00)	48.23 (55.62)
2.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 175 ml/ha	48.95 (56.88)	47.24 (53.90)	46.07 (51.87)	56.04 (68.79)	54.29 (65.93)	52.17 (62.39)	68.90 (87.04)	66.02 (83.48)	63.93 (80.68)
3.	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha	54.31 (65.97)	52.48 (62.90)	50.50 (59.54)	61.15 (76.71)	58.32 (72.42)	56.72 (69.89)	73.52 (91.95)	70.63 (89.00)	67.44 (85.28)
4.	Beta-cyfluthrin 2.5% SC at 720 ml/ha	47.40 (54.19)	46.65 (52.87)	45.28 (50.48)	53.14 (64.01)	51.14 (60.64)	50.07 (58.80)	62.69 (78.95)	60.18 (75.27)	58.08 (72.04)
5.	Imidacloprid 200SL at 210 ml/ha	40.33 (41.89)	37.23 (36.61)	34.22 (31.63)	41.92 (44.64)	37.57 (37.18)	35.14 (33.13)	44.63 (49.36)	39.61 (40.64)	36.73 (35.77)
6.	Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG (Tank Mixture) at 312.5ml +125 g	44.23 (48.65)	42.69 (45.97)	41.42 (43.76)	50.63 (59.77)	48.32 (55.77)	46.51 (52.64)	58.68 (72.98)	56.81 (70.03)	54.59 (66.42)
7.	Monocrotophos 36SL at1250 ml/ha	41.08 (43.18)	39.65 (40.72)	38.44 (38.65)	45.55 (50.96)	42.77 (46.12)	40.55 (42.27)	54.27 (65.90)	50.56 (59.64)	46.26 (52.19)
8.	Triazophos 40 EC at1000 ml/ha	46.67 (52.91)	45.56 (50.97)	44.20 (48.60)	53.70 (64.95)	51.81 (61.77)	50.04 (58.76)	62.88 (79.22)	59.60 (74.40)	58.73 (73.06)
9.	Endosulfan 35EC at1250 ml/ha	47.16 (53.72)	45.68 (51.18)	44.63 (49.36)	54.16 (65.72)	52.53 (63.00)	50.76 (59.98)	64.30 (81.19)	62.42 (78.57)	59.90 (74.85)
10.	Untreated Control (Water spray)	-	-	-	-	-	-	-	-	-
	S.Em ±	0.80	0.81	0.98	1.06	0.92	0.87	1.62	1.35	1.26
	C.D. at 5%	2.33	2.36	2.85	4.00	2.70	2.62	4.70	3.92	3.67

* Values in parenthesis are retransformed per cent value

Table 5. Effect of Beta-cyfluthrin 9% + Imidacloprid 21% 300 OD on pod damage, natural enemies and seed yield of chickpea

S. No.	Treatments	Pod damage (%)		Natural enemies population/plant				Yield (q/ha)	
				Chrysoperla carnea		Coccinella spp.			
		2007	2008	Grub	Adult	Grub	Adult	2007	2008
1	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 150 ml/ha	26.46 (19.85)*	26.66 (20.13)	0.89 (0.30)	0.86 (0.24)	0.88 (0.27)	0.93 (0.36)	12.90	12.67
2	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 175 ml/ha	18.32 (9.88)	16.38 (7.96)	0.90 (0.31)	0.86 (0.24)	0.88 (0.28)	0.93 (0.36)	15.42	16.05
3	Beta-cyfluthrin 9% + Imidacloprid 21% - 300 OD at 200 ml/ha	14.02 (5.87)	12.69 (4.38)	0.88 (0.28)	0.85 (0.22)	0.89 (0.30)	0.92 (0.34)	16.85	16.92
4	Beta-cyfluthrin 2.5% SC at 720 ml/ha	20.56 (12.33)	19.29 (10.91)	0.88 (0.28)	0.85 (0.22)	0.89 (0.30)	0.95 (0.40)	15.10	14.78
5	Imidacloprid 200SL at 210 ml/ha	28.09 (22.17)	27.24 (20.95)	0.89 (0.30)	0.86 (0.24)	0.88 (0.27)	0.93 (0.36)	13.98	14.32
6	Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG (Tank Mixture) at 312.5ml +125 g	24.21 (16.82)	22.62 (14.80)	0.88 (0.28)	0.86 (0.24)	0.89 (0.30)	0.92 (0.35)	14.72	13.97
7	Monocrotophos 36SL at1250 ml/ha	31.03 (26.57)	31.92 (27.96)	0.89 (0.30)	0.85 (0.22)	0.87 (0.26)	0.93 (0.36)	13.24	12.83
8	Triazophos 40 EC at1000 ml/ha	22.85 (15.08)	23.84 (16.34)	0.88 (0.28)	0.86 (0.24)	0.88 (0.28)	0.92 (0.34)	14.83	13.61
9	Endosulfan 35EC at1250 ml/ha	22.72 (14.92)	21.87 (13.88)	0.89 (0.30)	0.85 (0.22)	0.88 (0.29)	0.93 (0.36)	14.90	13.96
10	Untreated Control (Water spray)	36.81 (35.90)	38.36 (38.52)	0.89 (0.30)	0.87 (0.25)	0.89 (0.30)	0.95 (0.40)	11.36	10.84
	S.Em ±	0.46	0.38	0.008	0.009	0.008	0.009	0.47	0.39
	C.D. at 5%	1.32	1.09	NS	NS	NS	NS	1.37	1.12

* Values in parenthesis are retransformed per cent value

population of aphid shows that ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @ 200 ml/ha caused significantly highest reduction in aphid population during both the years of experimentation. It was found significantly superior to all other treatments. It caused 65.21, 58.36 and 52.44; 76.83, 69.89 and 64.45; 92.45, 89.56 and 83.84 per cent; 64.84, 61.20 and 53.18; 80.31, 72.54 and 65.94; 94.57, 87.50 and 84.14 per cent reduction at 3, 5, and 7days after first, second and third sprays during *rabi* 2007-08 and 2008-09, respectively. Ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @175ml/ha was the next effective treatment which caused 56.42, 69.36 and 82.55; 55.70, 70.49 and 85.99 per cent reduction at 3days after first, second and third spray during *rabi* 2007-08 and 2008-09, respectively. It was found superior to remaining treatments with 52.40, 65.47and 74.70 per cent; 54.90, 65.43 and 79.64 per cent reduction in aphid population at 3 days after first, second and third spray during Rabi 2007-08 and 2008-09, respectively.

Pod borer : Among all the treatments ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @ 200 ml/ha was found significantly superior to all treatments and caused highest reduction in the larval population of pod borer .It was followed by ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @175 ml/ha, Beta cyfluthrin 2.5 %SC, Triazophos 40 EC@1000ml/, endosulfan @1250 ml and tank mixture of Lamdacyhalothrin 5% EC + Thiamethoxam 25WG@ 312.5ml +125g/ha.

Ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @ 200 ml/ha caused 63.93, 58.15 and 52.86; 74.94, 65.86 and 60.75; 89.33, 85.13 and 80.31 per cent; 65.97, 62.90 and 59.54; 76.71, 72.42 and 69.89; 91.95, 89.00 and 85.28 per cent reduction in pod borer larvae at 3,5 and 7 days after first, second and third spray during *rabi* 2007-08 and 2008-09, respectively. Ready mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300 OD @ 175 ml/hat caused 78.91, 76.92 and 74.49; 87.04, 83.48 and 80.68 per cent mean reduction at 3,5 and 7 days after third spray during *Rabi* 2007-08 and 2008-09, respectively (Table 3-4).

The data presented in Table 5 clearly shows that Ready mixture of Beta-cyfluthrin 9%+Imidacloprid 21%-300 OD @ 200 ml/ha was the most effective treatment in checking early infestation of pod borer as it exhibited the lowest pod damage with a mean of 5.87 and 4.38 per cent as against 36.81 and 38.36 per cent in control during *rabi* 2007-08 and 2008-09, respectively. The respective values of pod damage in ready mixture of Beta-cyfluthrin 9%+Imidacloprid 21%-300 OD @ 175 ml/ha was 9.88 and 7.96 per cent. It was followed by Beta cyfluthrin 2.5 %SC @ 720 ml, Triazophos 40 EC@1000ml, endosulfan @1250 ml and tank mixture of Lamdacyhalothrin 5% EC+ Thiamethoxam 25WG@ 312.5ml +125g/ha

Effects on natural enemies and seed yield : The ready mixture of Beta-cyfluthrin 9%+Imidacloprid 21%-300 OD @150,175 and 200 ml/ha along with other treatments did not cause adverse effects on the population of grub and adults of *Coccinella* spp. and *Chrysoperla carnea*.. Their population among different treatments and control was found statistically to at par each other

Ready mixture of Beta-cyfluthrin 9%+Imidacloprid 21%-300OD @, 200 ml/ha recorded the significantly highest yield of 16.85 and 16.92q/ha during *rabi* 2007-08 and 2008-09, respectively. It was followed by ready mixture of Beta-cyfluthrin 9%+Imidacloprid 21% 300 OD @ 175 ml/ha which yielded 15.42 and 16.05 q/ha as against 11.36 and 10 84 q/ha in control during *rabi* 2007-08 and 2008-09, respectively.

In the present investigation ready mix mixture of Beta-cyfluthrin 9% + Imidacloprid 21%-300OD was found more effective against fruit borer as well as aphid than the tank mix mixture and sole application of insecticides. The present finding corroborates with the findings of Tamboli *et al.,* 2008 who reported efficacy of ready mix mixture against *H. armigera* in pigeon pea, Ashok Kumar *et al.,* 2008, against insect pests of cotton and against fruit borer and sucking insect pests in tomato by Ameta (2008).

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