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HORTICULTURE

Impact of Coriander Intercropping on the Incidence of Defoliator, *Spoladea recurvalis* Fabricius in Amaranthus

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ABSTRACT

The investigation on the impact of coriander CO (CR) 4 intercropping with the clipping type of amaranthus (CO3) for managing the defoliator, *Spoladea recurvalis* Fabricius was conducted in two different locations. To assess the influence of coriander and its repellency effects in varied planting ratio of amaranthus and coriander *viz.,* 1:1, 2:1, 3:1, 4:1, and 5:1 were evaluated along with amaranthus sole crop. The results obtained on the aspects of amaranthus plant height, number of branches per plant, number of larvae per plant, percent foliage infestation, and total green yield clearly indicated that there is no more negative impact on the plant height aspect was registered due to intercropping with coriander crop. Among the different ratios evaluated, the highest plant height was observed and registered in the 5:1 ratio of planting, which is significantly higher than amaranthus sole crop. In the aspect of the number of branches per plant, the 1:1 and 2:1 ratio recorded the highest number of branches compared with the 4:1 and 5:1 ratio. It was considering the number of larvae per plant and percent foliage infestation 2:1 and 3:1 ratio of planting registered the lowest larval population (1.22 – 1.45/plant) and foliage infestation with the higher average yield of 31.79 and 30.02 tonnes/hectare (sum of 10 clippings) when compared with amaranthus sole crop cultivation. Among the varied ratio evaluated, the 2:1 and 3:1 ratio of amaranthus : coriander planting was found to be better in registering the lowest percent foliage infestation (10.52 -11.25%) with a higher yield (30.02 – 31.79 tonnes/ha.).

HIGHLIGHTS

- Amaranthus defoliator, *Spoladea recurvalis* is the major Lepidopteran in causing 50 – 70 % reduction in yield.
- Indiscriminate use of pesticide in amaranth is of great risk to the consumers' health as well as leads to the environmental hazard.
- Identification of alternative management strategies *viz*., use of botanicals, intercropping, trap cropping, *etc.* may aid to lessen pesticide usage in amaranthus.

Keywords: Amaranthus, *Spoladea recurvalis, i*ntercropping, coriander, IPM

Amaranthus (*Amaranthus tristis* L.) an annual herbaceous, leafy vegetable, belongs to the family Amaranthaceae. It is known to be a native of Tropical America, but it is now very widely distributed throughout the tropics (Stallknecht and Schultz-Schaeffer 1993; Palada and Chang 2003). It is consumed for its highly nutritious content in Africa and Asia. It has been cultivated for more than 8000 years ('O'Brien and Price 1983), and now it has been found to be a cosmopolitan plant in India (Putnam *et al*. 1989). The popularity of vegetable amaranthus is due to its earliness to maturity, palatability, and nutritive value (Kamalanathan *et*

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al. 1973; Oke 1983). Because of its low production costs, amaranth is one of the cheapest dark-green leafy vegetables in tropical markets and is often described as the poor man's vegetable (Varalakshmi 2004). Amaranth is a nutritious green because of its high-level content of essential micronutrients like carotene, vitamin A, B, C and D, iron, and calcium. It is recommended as a portion of good food with medicinal properties for pregnant women, children lactating mothers, and patients with constipation, fever, hemorrhage, and anaemia (Quinton, 2006). Amaranthus grows rapidly; the time between planting and harvest of the tender foliage and stems is short-generally only 3-6 weeks. In Tamil Nadu (South India), plants are pulled 3 weeks after sowing and used as "tender greens". (Aderolu *et al*. 2013) stated that the productivity of amaranthus is heavily affected by the range of insect pests that comes under Lepidoptera, Coleoptera, Hemiptera, and Orthoptera. In this aspect, the lepidopteran defoliator *Spoladea recurvalis* Fabricius is a very serious pest in amaranthus. Dales (1996) noted that the use of synthetic insecticides pose a health risk and result in environmental pollution. Indiscriminate pesticide use is detrimental to the environment and human health and increases insects' resistance to pesticides. Amaranth is harvested periodically throughout the growing season in short harvest intervals for consumption, and hence pesticide residues may remain on the harvested leaves, posing serious safety concerns to consumers.

Alternative management strategies such as using organics for pest management can help to reduce pesticide misuse on amaranthus. Despite several constraints, bio-pesticides are being used in amaranthus production. In India, organic vegetable production is gaining importance as many of the vegetables are consumed as raw in salads and believed that they are free from harmful pesticide residues; research has been geared towards identifying nonchemical methods of pest control that are safe, cheap, easy to apply and accessible to farmers. Focusing this, the current study was carried out to assess the 'Impact of coriander intercropping on the incidence of *Spoladea recurvalis* in Amaranthus'.

MATERIALS AND METHODS

The field evaluation of coriander intercropping on the incidence of *Spoladea recurvalis* in amaranthus was conducted in the research block of Anbil Dharmaligam Agricultural College and Research Institute, Trichy. The confirmatory trial on the results obtained was laid out in the farmers' field at Inaamnavalur village, Manikandam block, Trichy district located in the Cauvery Delta Agro-climatic Zone of Tamil Nadu. It is situated at 10°45'N latitude and 78°36'E longitude, at an altitude of 85 m above the mean sea level. The treatments *i.e.*, amaranthus main crop (Variety: CO 3) intercropped with coriander (CO(CR)4) at 1:1, 2:1, 3:1, 4:1, 5:1 ratio and the sole amaranthus raised as a standard check were evaluated in Randomized Block Design (RBD) with four replications.

The experimental area was ploughed twice, and basal application of 25 t/ha of FYM, fertilizer dose of 75 kg/ha Nitrogen, 25 kg/ha phosphorous, and 20 kg/ha of potash was given, and the layout was prepared after leveling the finely powdered soil. The other agronomic package of practices like thinning, weeding, irrigation and top dressing *etc.*, were followed as per the recommendation (Crop Production Guide for Horticultural Crops, 2020). Amaranthus seeds were mixed with fine sand (1 g seed to 100 g of sand) for even distribution, and they were sown in lines of 20 cm apart in different row proportions. The seeds of coriander were sown one week before sowing of amaranthus respectively for synchronization of germination and harvesting of intercrop and main crop. The plots were periodically observed, and gap-filling was done one week after sowing of intercrops and main crops in order to maintain the recommended plant population. One hand weeding was carried out 10 days after sowing, and irrigation were given once a week depending upon the climatic conditions.

The parameters like plant height (cm), number of leaves per plant, number of branches per plant, number of larva per plant, and percent foliage infestation were recorded from the five randomly tagged plants in each treatment in all the four replications on 7th, 14th and 21th days after sowing (DAS). The observation on the larval population was recorded during morning hours between 6:00 AM and 7:30 AM, to derive the exact percent defoliator incidence.

Varietal Description

Amaranthus

CO 3 (*Amaranthus tritis*) - It is a selection from the local type and yields 30.72 tonnes of greens per hectare. It is a clipping type (*A. tristis*). It lends itself for 10 clippings, commencing from 20 days after sowing, and provides a continuous supply of luscious tender green for three months.

Coriander

CO (CR) 4 - Coriander has a short duration (65-70 days). It can be cultivated under rainfed and irrigated conditions. The plants of the CO (CR) 4 variety grow up to a height of 35 cm and have a distinguishing pink coloration at the basal portion of the main stem. They are semi-erect in growth habits with shorter internodes. The plants flower in 30-35 days after sowing, and this variety has been found to be more suitable for crop rotation, mixed cropping, and inter-cropping systems.

RESULTS AND DISCUSSION

The results of the first experiment laid out at the college campus revealed that initially, a week after sowing highest plant height of 5.03 cm was recorded in the coriander intercropped plant with 5:1 ratio. Whereas the least height of 4.69 cm was registered in 1:1 planting, and it was in tune with the height observed in the sole crop (4.76 cm). During the second week, a logical increase in plant height was observed, and the highest plant height of 20.34 cm was registered in amaranthus sole, and there is no significant difference between the treatments *viz.*, 2:1, 3:1, 4:1, and 5:1 ratio of planting. The observations on the plant height on 21 DAS indicated that amaranthus in 5:1 planting system reaches the highest plant height of 24.27 cm when compared with the 1:1 ratio of planting (21.98 cm), all other ratios of plantings are on par with one another in registering the plant height. The observation on a number of amaranthus branches formation in three weeks after sowing showed that the highest number of branches were recorded in the amaranthus : coriander planting ratio of 1:1 and 2:1, *i.e.*, 2.80 branches per plant (Table 1).

The same trend of results was observed in the confirmatory trial conducted at farmers' field at Inaamnavalur (Table 2), the highest plant height of 23.20 cm in 5:1 ratio of planting on 21 DAS when compared to 1:1 ratio (19.78 cm) and amaranthus sole (21.33 cm) with a non-significant difference on a number of branches between planting ratio. The pooled analysis of both the trials indicated that the planting of amaranthus and coriander in 5:1 ratio

Table 1: Impact of coriander intercropping on the incidence of *Spoladea recurvalis* in Amaranthus

Treatments	Plant height (cm)*			Number of branches/plant*		Number of larvae/plant*			Percent foliage infestation (%)**		
	7 DAS	14 DAS	21 DAS	14DAS	21 DAS	7 DAS	14 DAS	21 DAS	7 DAS	14 DAS	21 DAS
T1 – Amaranthus + Coriander (1:1)	4.69 (2.18) ^{b}	18.59 (4.37) ^{c}	21.98 (4.74) ^{c}	2.00 (1.58) ^{c}	2.65 (1.64) ^{a}	0.54 (0.76) ^{e}	1.46 (1.39) ^{f}	1.56 (1.26) ^{f}	25.71 (30.97) ^{b}	21.40 (27.38) ^{d}	14.97 (27.38) ^{b}
T2 – Amaranthus + Coriander (2:1)	4.89 (2.22) ^{b}	19.85 (4.51) ^{ab}	23.67 (4.92) ^{b}	2.80 (1.82) ^{a}	2.80 (1.69) ^{a}	0.44 (0.69) ^{f}	1.54 (1.42) ^{e}	1.32 (1.17) ^{e}	20.00 (26.00) ^{c}	18.42 (25.57) ^{e}	13.33 (25.57) ^{c}
T3 – Amaranthus + Coriander (3:1)	5.01 (2.25) ^{a}	19.80 (4.51) ^{b}	23.18 (4.87) ^{b}	1.98 (1.56) ^{d}	2.80 (1.69) ^{c}	0.62 (0.81) ^{d}	1.97 (1.57) ^{c}	1.78 (1.35) ^{d}	35.48 (36.70) ^{b}	18.20 (25.27) ^{c}	13.92 (25.27) ^{c}
T4 – Amaranthus + Coriander (4:1)	4.94 (2.23) ^{b}	19.53 (4.47) ^{b}	23.34 (4.88) ^{b}	2.50 (1.73) ^{b}	2.50 (1.60) ^{b}	0.82 (0.93) ^{c}	1.84 (1.52) ^{d}	1.89 (1.39) ^{c}	36.66 (37.37) ^{a}	19.49 (26.28) ^{e}	17.34 (26.28) ^{b}
T5 – Amaranthus + Coriander (5:1)	5.03 (2.25) ^{a}	19.74 (4.50) ^{b}	24.27 (4.98) ^{a}	2.55 (1.75) ^{b}	2.55 (1.61) ^{b}	0.93 (0.98) ^{b}	2.67 (1.78) ^{b}	2.59 (1.62) ^{b}	38.00 (38.01) ^{b}	23.83 (29.24) ^{b}	18.42 (29.24) ^{b}
T6–Sole crop (Amaranths)	4.76 (2.19) ^{b}	20.34 (4.56) ^{a}	23.60 (4.91) ^{b}	2.30 (1.67) ^{b}	2.60 (1.63) ^{b}	1.02 (1.03) ^{a}	2.73 (1.79) ^{a}	2.67 (1.64) ^{a}	46.15 (42.62) ^{a}	26.74 (31.19) ^{b}	28.77 (31.94) ^{a}
S. Ed	0.0220	0.0289	0.0197	0.0211	0.0211	0.0045	0.0076	0.0045	0.2910	0.1544	0.1538
C.D. at 5%	0.0470	0.0615	0.0420	0.0449	0.0449	0.0104	0.0162	0.0096	0.6203	0.3291	0.3278

** Figure in parentheses are transformed values of √x+0.5, ** figures in parentheses are arc sine transformed values; Means followed by the same alphabet(s) are not significantly different (P=0.05); DAS- Days After Sowing.*

Table 2: Impact of coriander intercropping on the incidence of *Spoladea recurvalis* in Amaranthus (Farmers Field location)

Treatments	Plant height (cm)*			Number of branches/plant*		Number of larvae/plant*			Percent foliage infestation (%)**		
	7 DAS	14 DAS	21 DAS	14DAS	21 DAS	7 DAS	14 DAS	21 DAS	7 DAS	14 DAS	21 DAS
T1 – Amaranthus + Coriander (1:1)	4.61 (2.26) [b]	17.93 (4.29) [d]	19.78 (4.50) [d]	2.00 (1.58) [c]	2.65 (1.58) [c]	0.78 (1.13) [d]	1.36 (1.36) [f]	1.47 (1.40) [f]	28.48 (32.25) [d]	23.78 (29.18) [a]	14.39 (22.29) [b]
T2 – Amaranthus + Coriander (2:1)	4.92 (2.33) [a]	19.85 (4.51) [a]	22.24 (4.77) [b]	2.80 (1.82) [a]	2.75 (1.80) [a]	0.47 (0.98) [f]	1.27 (1.33) [e]	1.12 (1.27) [e]	24.06 (29.37) [e]	14.32 (22.23) [e]	7.72 (16.13) [e]
T3 – Amaranthus + Coriander (3:1)	4.92 (2.33) [b]	19.28 (4.45) [ab]	22.70 (4.82) [b]	2.80 (1.69) [a]	2.55 (1.75) [a]	0.56 (1.02) [e]	1.87 (1.53) [c]	1.53 (1.42) [d]	34.89 (36.20) [b]	14.66 (22.51) [e]	8.58 (17.03) [d]
T4 – Amaranthus + Coriander (4:1)	4.84 (2.31) [b]	18.93 (4.41) [bc]	21.28 (4.67) [c]	2.35 (1.69) [b]	2.75 (1.80) [b]	0.89 (1.17) [c]	1.32 (1.34) [d]	1.21 (1.30) [c]	30.66 (33.62) [c]	18.51 (25.48) [c]	12.93 (21.07) [c]
T5 – Amaranthus + Coriander (5:1)	5.03 (2.35) [a]	19.26 (4.45) [ab]	23.20 (4.87) [a]	2.55 (1.75) [a]	2.75 (1.80) [b]	1.08 (1.25) [b]	1.79 (1.51) [b]	1.83 (1.52) [b]	34.38 (37.50) [b]	21.83 (27.85) [b]	15.04 (22.81) [a]
T6–Sole crop (Amaranths)	4.65 (2.27) [b]	18.81 (4.39) [d]	21.33 (4.67) [c]	2.30 (1.67) [b]	2.55 (1.75) [b]	1.12 (1.27) [a]	1.97 (1.57) [a]	2.16 (1.63) [a]	31.00 (37.76) [a]	27.55 (31.30) [d]	24.71 (29.33) [ab]
S. Ed	0.0307	0.0289	0.0197	0.0211	0.0211	0.0058	0.0053	0.0060	0.2523	0.1620	0.1475
C.D. at 5%	0.0655	0.0615	0.0420	0.0449	0.0449	0.0124	0.0113	0.0129	0.5377	0.3450	0.3144

** Figure in parentheses are transformed values of √x+0.5, ** figures in parentheses are arc sine transformed values; Means followed by the same alphabet(s) are not significantly different (P=0.05); DAS- Days After Sowing.*

provided the highest plant height of amaranthus (23.73 cm) on 21 DAS, when compared with all other planting ratios. Considering the branches, the planting ratio 1:1 and 5:1 are found to be effective in registering the highest number of amaranthus plant branches, *i.e.,* 2.72 and 2.65, respectively (Table 3).

The observations on the number of larvae per plant (Table 1) depicts that the population was less than one per plant in all the planting ratio except in the sole planting system on 7 DAS. On 14 DAS, there is a variation in the larval population between planting ratio, but the highest larval population of 2.59 per plant was registered in 5:1 planting ratio on 21 DAS. The lowest larval population of 1.32 per plant was noticed in the planting ratio 2:1, and it was significantly followed by 1:1 ratio of planting on 21 DAS against amaranthus sole planting (2.67no./plant). The confirmatory evaluation at the farmers' location also revealed the lowest number of larval population of 1.12 per plant was recorded in 2:1 planting ratio, and it was significantly followed by the 4:1 and 1:1 planting ratio, but in amaranthus sole crop, the highest population of 2.73 larvae per plant was found when compared with all other planting ratios with coriander (Table 1). Considering the average larval population by overall analysis, the planting ratio of amaranthus with coriander on 2:1 ratio found to be better in registering the lowest number of larval population (1.22/plant) on 21 DAS. It was followed by the 1:1 and 3:1 main and intercrop planting systems which registered 1.51 and 1.65 larvae per plant, respectively, against the highest population of 2.41 larvae per plant in amaranthus sole planting (Table 3).

The effect of intercropping of coriander in amaranthus in the experimental plot shows a significant difference in the percent foliage infestation; thus the highest infestation was recorded in 5:1 amaranthus and coriander planting ratio in all the three consecutive weeks of crops with the damage percent of 38.00, 23.83 and 18.42, it was followed in 4: 1 planting (36.6 %, 19.49 %, and 17.34 %) respectively on 7, 14 and 21 DAS. In the 2:1 planting system, the least percent foliage damage of (20.00 %, 18.42 %, and 13.33 %) was recorded in all three weeks compared with the highest damage level of 28.77 percent foliage infestation in amaranthus sole crop (Table 1). These findings are in accordance with the observations recorded at farmers' field location that the planting ratio 2:1 registered the lowest percent foliage infestation of 7.72 percent. It was followed 3:1 and 4:1 plantings by registering 8.58 and 12.93 percent foliage infestation, respectively. The plating ratio of 1:1 and 5:1 are in

Table 3: Impact of coriander intercropping on the incidence of *Spoladea recurvalis* in Amaranthus (Pooled analysis)

Treatments	Plant height (cm)*			Number of branches/plant*		Number of larvae/plant*			Percent foliage infestation (%)**		
	7 DAS	14 DAS	21 DAS	14 DAS	21 DAS	7 DAS	14 DAS	21 DAS	7 DAS	14 DAS	21 DAS
T1 – Amaranthus + Coriander (1:1)	4.65 (2.15) c	18.26 (4.27) c	20.88 (4.56) d	2.00 (1.41) e	2.72 (1.65) a	0.66 (0.81) d	1.41 (1.23) e	1.51 (1.40) e	27.09 (32.25) e	22.59 (29.18) a	14.68 (22.29) cd
T2 – Amaranthus + Coriander (2:1)	4.90 (2.21) b	19.85 (4.45) a	22.95 (4.79) b	2.80 (1.67) a	2.52 (1.58) d	0.45 (0.67) f	1.40 (1.10) e	1.22 (1.27) f	22.03 (29.37) f	16.37 (22.23) d	10.52 (16.13) e
T3 – Amaranthus + Coriander (3:1)	4.96 (2.22) ab	19.54 (4.42) ab	22.94 (4.78) b	2.77 (1.66) a	2.60 (1.61) bc	0.59 (0.76) e	1.92 (1.28) c	1.45 (1.42) c	35.18 (36.20) c	16.43 (22.51) d	11.25 (17.03) d
T4 – Amaranthus + Coriander (4:1)	4.89 (2.21) b	19.23 (4.38) b	22.31 (4.72) c	2.42 (1.55) c	2.62 (1.62) bc	0.85 (0.92) c	1.58 (1.24) d	1.55 (1.30) d	33.66 (33.62) d	19.00 (25.48) c	15.13 (21.07) c
T5 – Amaranthus + Coriander (5:1)	5.03 (2.24) a	19.50 (4.41) ab	23.73 (4.87) a	2.55 (1.59) b	2.65 (1.62) b	1.00 (1.00) b	2.23 (1.48) b	2.21 (1.52) b	36.19 (37.50) b	22.83 (27.85) a	16.73 (22.81) b
T6–Sole crop (Amaranths)	4.70 (2.16) c	19.57 (4.42) ab	22.46 (4.73) bc	2.30 (1.51) d	2.57 (1.60) cd	1.07 (1.03) a	2.35 (1.55) a	2.41 (1.63) a	41.82 (37.76) a	22.14 (24.76) b	23.74 (29.16) a
S. Ed	0.0123	0.0199	0.0283	0.0092	0.0102	0.0064	0.0099	0.0065	0.0290	0.0213	0.2045
C.D. at 5%	0.0263	0.0425	0.84	0.0195	0.0218	0.0136	0.0210	0.0138	0.0618	0.0453	0.4359

** Figure in parentheses are transformed values of √x+0.5, ** figures in parentheses are arc sine transformed values; Means followed by the same alphabet(s) are not significantly different (P=0.05); DAS- Days After Sowing.*

Table 4: Impact of intercropping on the incidence of *Spoladea recurvalis* in amaranthus on yield

Treatments	Treatment details	Trial 1		Trial 2		Compiled data	
		Yield (tonnes/ hectare)	B:C ratio	Yield (tonnes/ hectare)	B:C ratio	Yield (tonnes/ hectare)	B:C ratio
T1	Amaranthus + Coriander (1:1)	19.19	2.13	20.2	2.24	19.69	2.18
T2	Amaranthus + Coriander (2:1)	31.53	3.50	32.05	3.56	31.79	3.53
T3	Amaranthus + Coriander (3:1)	29.88	3.32	30.17	3.35	30.02	3.33
T4	Amaranthus + Coriander (4:1)	27.21	3.02	28.23	3.13	27.72	3.08
T5	Amaranthus + Coriander (5:1)	24.32	2.7	25.23	2.80	24.77	2.75
T6	Sole crop (Amaranths)	22.67	2.51	23.27	2.58	22.97	2.55

tune with one another in registering percent foliage infestation (14.39 % and 15.04 %) on 21 DAS (Table 2).

On depicting the results obtained on both the experimental plots, the planting ratio of 2:1 found to be better in reducing the percent foliage infestation (10.52 %) and followed by 3:1 (11.25 %) and 1:1 (14.68 %) planting ratio. The planting ratio 4:1 and 5:1 registered more than 14 percent foliage damage on 21 DAS against the greatest damage of 22.74 percent in amaranthus sole crop (Table 3).

The observation on the yield parameters depicts that the impact of intercropping showed a difference among the intercropping ratio, whereas in amaranthus intercropped with coriander planting system of 2:1 found to be good in registering the highest yield (31.79 tonnes/ha) with the high benefit-cost ratio of 3.53. The planting ratio 3:1 and 4:1 are next to 2:1 with the higher yield of 30.02 and 27.72 tonnes/hectare, respectively (Fig. 1). The least production on yield (19.69 tonnes/ hectare) was recorded in amaranthus intercropped with coriander (1:1), but it was 22.97 tonnes in amaranthus sole crop.

The results obtained on the aspects of amaranthus plant height, number of branches per plant, number of larvae per plant, percent foliage infestation, and total yield clearly indicated that there is no more negative impact on the plant height aspect was registered due to intercropping with coriander crop. Among the different ratios evaluated, the highest height was observed and registered in 5:1 ratio of planting, which is significantly higher than amaranthus sole crop. The meager reduction in the

plant height was recorded in 1:1 ratio of planting.

In the aspect of the number of branches per plant, the 1:1 and 2:1 ratio recorded the highest number of branches compared with 4:1 and 5:1 ratio. Considering the number of larvae per plant and percent foliage infestation, the 2:1 and 3:1 ratio of planting registered the lowest larval population and foliage infestation with the higher average yield of 32.05 and 30.17 tonnes/hectare (sum of 10 clippings) when compared with 1:1 and amaranthus sole crop cultivation.

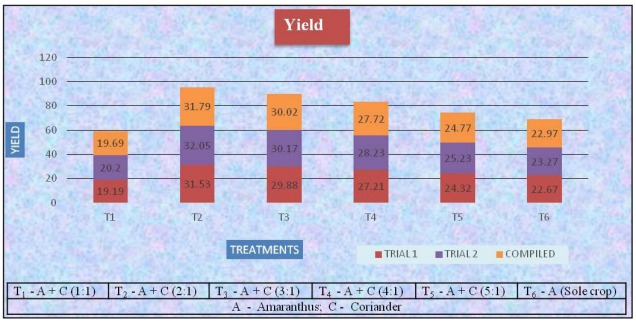

Fig. 1: Impact of intercropping on the incidence of *S. recurvalis* on yield

Among the varied ratio evaluated 2:1 and 3:1 ratio of amaranthus: coriander planting was found to be better in providing the highest number of branches and the lowest larval incidence with a higher yield. The impact of intercropping in reducing *S. recurvalis* population might be due to the repellency effect of coriander. The repellency effect of coriander in reducing the lepidopteran defoliators was reported in several research findings. The present investigation of the impact of 2:1 and 3:1 ratio of amaranthus: coriander was also in consonance with the findings of Sujay and Giraddi (2015) on chili pest management and Chandrasekaran *et al.* (2014) on the management of sesame shoot Webber by intercropping pearl millet and pigeon pea with sesame. The influence of raising coriander, cluster beans with the main crop brinjal for the management of brinjal fruit and shoot borer suppression was well documented by Paul *et al.* (2015) and Chinnadurai *et al.* (2019), respectively. The findings of Paul *et al.* (2015) in intercropping coriander for pod borer suppression in chickpea while following 2:2 ratio of planting and the findings of Tonashyal (2010) by intercropping mulberry with the vegetables at the ratio of 2:2 also in agreement with the present findings.

CONCLUSION

Intercropping coriander with amaranthus not only influences the reduction in *S. recurvalis* infestation also helps the farmers to avoid excessive and indiscriminate usage of highly toxic insecticides and synthetic pyrethroids in the most common and cheapest source of poor man's vegetable like amaranthus. Hence, raising amaranthus and coriander in 2:1 or 3:1 ratio is suggested to minimize the *S. recurvalis* infestation without any foliar spraying of hazardous insecticides. The advantages of these kinds of intercropping for raising harmless organic vegetable crops for the welfare of the farming community and public health was also strengthened by the reports of Hailu Gebru (2015).

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