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Bangladesh J. Agril. Res. 37(3): 547-550, September 2012 **Short Communication**

EFFECT OF INTERCROPPING CHILI *(Capsicum annuum* L.) WITH ONION *(Allium cepa* L.) IN SANDY REGOSOL

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Chili (Capsicum annuum L.) is one of the important commercial vegetable crops and widely cultivated throughout the tropical and subtropical countries in the world. It is a major cash crop in Sri Lanka and it has become an essential ingredient in Sri Lankan meals and also has medicinal value too. Green chili is rich in vitamin A and vitamin C (Datta and Jana, 2010) and in 'rutin' which is of immense pharmaceutical need (Purseglove, 1977). Intercropping of chili with different crops offers greater scope to utilize the land and other resources to maximum extent.

Onion *(Allium cepa* L.) is an important bulb crop and indispensable item in every kitchen as condiment and vegetable. It is used as vegetable, salad, spice and in various tasty preparations and also widely used in pickles, chutney, flavouring and cooked vegetable. Onion contains a lachrymatic agent, a strong antibiotic in addition to fungicidal, bacterial, anti-cholestrol, anticancer and anti-oxidant components such as quercetin (Baghizadeh *et al.,* 2009) and exhibits greater susceptibility to weed competition than most crops due to slow germination and also absence of foliages. Hosmani (1990) had reported higher yield for chili when intercropped with onion. The present experiment was conducted to study the yield advantages of chili-onion intercropping compared to mono-cropping in sandy regosol.

The experiment was carried out at the Agronomy farm of the Eastern University of Sri Lanka in 2010. In order to study the yield advantages of chili-onion intercropping, this experiment was designed in Complete Randomized Design. Treatments were chili mono-cropping (T_1), onion mono-cropping (T_2), and chili-onion intercropping (T_3) and each treatment had seven replicates. The experimental site was situated between 81^0 34' latitude and longitude and 7^0 48' longitude. It comes under the agro-ecological zones of low country dry zone in Sri Lanka. Optimum temperature is 31^0C and annual rainfall is 1600 mm. The soil of experimental site is sandy regosol.

Chili *cv* PC-1 and onion *cv* Vethalam were used in this experiment. After testing the germination percentage of chili seeds, it was sown in the nursery subsequently the healthy 30 days seedlings were transplanted in April 2010 at 60 cm × 45 cm spacing while onion bulbs were planted in between chili rows. The onion spacing in mono-cropping was 10 cm between and within rows. Each experimental plot consisted of 2.40 × 1.75 m^2. Basal fertilizers (100 kg/ha triple

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super phosphate and 50 kg/ha muriate of potash) were applied two days before transplanting of chili plants thereafter urea as top dressing were applied at the flowering stage of chili as recommended by the Department of Agriculture of Sri Lanka to chili crop. Yield attributes of both the crops and yield advantages parameters were recorded and data were analyzed.

The results showed that there were insignificant differences ($P>0.05$) between mono and inter crops in number of green fruits per plant, length and diameter of fruits and also fresh weight of marketable green fruits of chili. Mean number of fruits per plant was high in mono-cropping (51.71) than in intercropping (48.43) as shown in Table 1. Fruit length (4.14 cm) and diameter (1.72 cm) were slightly high in mono-cropping and low in intercropping (3.95 cm, 1.71 cm). Also fresh weight of green fruit was high in mono-cropping (4.37 g) compared to intercropping (4.23g). Thunya and Pratchya (2003) reported fruit length positively correlated with fruit width. Datta and Jana (2010) stated that the fruit length and diameter was positively and significantly correlated with individual fruit weight. Hosmani (1990) reported higher yield for chili when intercropped with onion. In the present study, there was no remarkable variation in green fruit yield between mono and intercrops but higher (8.61 t/ha) in mono-crop.

Significant difference in onion plant height ($P<0.05$) between mono and intercrops was observed which was higher in intercropping (22.97 cm) and lower in mono-cropping (15.88 cm). This might due to more capture light by intercropping resulted grown taller plant than mono-cropping. More bulbs per plant was produced in mono-copping (4.67) while in intercropping it was low (3.92) though statistically insignificant, however, bulb diameter was superior in onion raised in intercropping (2.51 cm). Kabura *et al*. (2008) mentioned that onion pepper intercropping was not affecting the bulb size. It influences the plant growth yield as well as the splitting of bulb (Baloch *et al*., 1998). There was insignificant variations ($P>0.05$) between treatments in air dried weights of plant bulbs and leaves. Whole plant weight was more in intercropping (30.10g) due to high leaf weight (6.38g). Even though lower bulb weight was obtained in intercropping (23.67g) compared to mono-cropping (24.0g) there was not significantly different between them.

There was remarkable variation ($P<0.01$) in weed density between mono-cropping and intercropping. The weed population was reduced by 52% in intercropping compared to mono-cropping. In intercropping, only two narrow leaved weed species were found, such as *Cyperus rotundus* (94.74%) and Cynodon *dactylon* (5.26%). In mono-cropping, *Cynodon daclylon* (41.17%), *Cyperus brevfolius* (35.29 %) and *Cyperus rotundus* (23.52%) and diversity of narrow leaved weed species were high compared to intercropping. There was significant difference in dry weight of weeds between mono-cropping and

intercropping and it was lower in intercropping (7.08 g/m^2) as compared to mono-cropping (19.41 g/m^2). The data indicated that intercropping controls weed population and diversity effectively than in mono-cropping in sandy regosol. Altier and Liebman (1986) pointed out that intercropping has a potential to suppress weeds and it offers the possibility of capturing a greater share of available resources than mono-crop.

Table 1. Yield attributes of chili and onion as mono-crop and intercrop.

Yield attributes	Chili mono-crop	Onion mono-crop	Chili-onion Intercrop	t-value
A. Chili				
Fruits per plant (no.)	51.71	-	48.43	1.49
Fruit length (cm)	04.14	-	03.95	1.01
Fruit diameter (cm)	01.72	-	01.71	0.90
Fresh weight of green fruit (g)	04.37	-	04.23	1.07
Marketable green fruit yield (t/ha)	08.61	-	07.80	
B. Onion				
Plant height (cm)		15.88	22.97	-3.94
Bulbs/plant (no.)	-	04.67	03.92	-3.94
Bulb diameter (cm)	-	02.28	02.51	-1.61
Air dried wt (g) of bulbs/plant	-	24.00	23.67	0.08
Air dried wt (g) of leaves/plant	-	04.10	06.38	-2.42
Air dried wt (g) of plant	-	28.30	30.10	-0.36
Bulb yield (t/ha)	-	16.28	04.50	
C. Yield advantages				
Land Equivalent Ratio (LER)	1.00	1.00	1.14	
Monetary Equivalent Ratio (MER)	1.00	1.00	1.01	
Net Return (LKR)	16,68,800	10,15,400	17,74,640	
Cost of Cultivation (LKR)	81,000	71,000	1,1 1,000	
Return/Rupee Invested (LKR)	21.60	15.30	16.98	

In this experiment, LER 1.14 in intercropping means that an area planted as a pure stand or monoculture, would require 14% more land to produce the same yield as the same area planted in an intercrop combination. Monetary equivalent ratio was 1.01 shows economic superiority of the system over mono-cropping. The cost of cultivation was high in intercropping compared to mono-cropping. Net return represents the actual income received by the farmers. High net return was achieved from intercropping due to combined yield from both chili and onion. Return per rupee invested ranged from 15.30 to 21.60. It was high in chili

mono-cropping compared with intercropping due to low cost of production. Higher net return (LKR 17, 74, 640) was achieved from chili-onion intercropping though higher cost was involved. Hence, intercropping could be suggested for the farmers if they effort money for their cultivation.

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