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Effect of Mulch Materials and Foliar Application of Micronutrients on the Growth and Yield of Sweet Pepper under Net House

Shapla Akter [a], Tahmina Mostarin [a], Khaleda Khatun [a], Nasir Mahmud [b], Samsun Nahar Hashi [a], Khodaiza Banu [a], Sayma Kabir [a], Amir Abdullah Hasnine [c] and Md. Abdus Samad [a*]

[a] Department of Horticulture, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh.
[b] Department of Agricultural Botany, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh.
[c] Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh.

Authors' contributions

This work was carried out in collaboration among all authors. Authors TM and KK planned the experiment and lead the research. Authors SA, TM and KK designed and carried out the research. Author MAS performed the statistical analysis. Authors SA, KB and SK carried out the research on the field. Authors SNH and SA collected the data. Authors NM, AAH and MAS wrote the manuscript. Authors NM, SNH, KB and SK managed the literature searches. All authors provided critical feedback and helped shape the research, analysis and manuscript. All authors read and approved the final manuscript.

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ABSTRACT

The study was carried out to evaluate the effect of different mulch materials and foliar application of micronutrients on growth and yield of sweet pepper under net house. The experiment consisted of two factors. Factor A: Three mulch materials *viz*., M_0-No mulch (control), M_2-Black polyethylene

**Corresponding author: Email: asamad5307@gmail.com;*

mulch and M_2-Rice straw mulch and Factor B: Three foliar application of micronutrients *viz.*, N_0-control (No micronutrients), N_1-Zn @0.6% as $ZnSO_4$ and N_2-B @0.6% as H_3BO_3. The experiment was laid out in a Randomized Complete Block Design (RCBD) with three replications. Data were recorded on growth, yield components, yield and quality of sweet pepper and significant variation was observed for most of the studied characters. Analysis revealed that the M_2N_2 treatment combination appeared to be best for achieving the higher growth, fruit yield and economic benefit of sweet pepper.

Keywords: Foliar application; micronutrientsm; sweet pepper; crop growth.

1. INTRODUCTION

"Sweet Pepper (*Capsicum annum* L.) is a year-round international vegetable crop belongs to Solanaceae family used in variety of ways for home consumptions, catering and industries" [1]. "Sweet pepper is native to southern part of North America and southern South America" [2]. "It is source of vitamin A, C and E. A 100 g of edible portion of pepper provides 24 Kcal of energy, 1.3 g of protein, 4.3 g of carbohydrates and 0.3 g of fat" [3]. "The nutritional quality of the fruits, especially as an excellent source of antioxidants-ascorbic acid, carotenoids and phenolic compounds makes the daily intake of pepper a health protecting factor in the prevention of chronic human degenerative and systemic sicknesses including cancer, diabetes, liver cirrhosis and cardio-vascular diseases" [4]. "It has introduced in Bangladesh for several years but not much familiar by the people or farmers. Some improper management practices contribute to produce low yield, mulching practices help to conserve soil moisture by reducing evaporation and control weeds effectively by reducing physiological functions of weed like germination, root, shoot and stem growth" [5]. "Mulching covers the soil surface, and hence, it is helpful in maintaining the soil temperature which is beneficial for overall crop growth. Nutrients are provided to the plants through both soil and foliar. Foliar application is the quickest and an excellent method of supplying plant nutrients" [6]. "Irregular nutrients management is mainly responsible for low production because application of different nutrients in required amount is given no attention. Many production problems in chillies are related to micronutrients deficiency" [7]. "Micronutrients are needed in very little quantity but are very important for proper growth of plants" [8]. "Micronutrients are usually required in minute quantities but essential for various activities; particularly zinc and boron play vital in the growth and development of plants due to catalytic effect on many metabolic processes" [9]. "Zinc activates the electrophile and nucleophiles as a component of plant carbonic anhydrase and many other photosynthetic enzymes, which influences the photosynthetic efficiency, chlorophyll structure and content. B is important for both flower development and initial fruit or seed set" [10] and "maintaining the structural integrity of cell wall and cell membranes" [11]. Therefore, it is clear that the growth and yield of sweet pepper can be increased by suitable mulch materials and judicious foliar application of micronutrients

2. MATERIALS AND METHODS

2.1 Experimental Site and experimental Framework

The research work was conducted at Horticulture Farm, Sher-e-Bangla Agricultural University, Sher-e-Bangla Nagar, Dhaka, during the period from November 2020 to April 2021. The location of the site was 23°74′ N Latitude and 90°35′ E Longitude with an elevation of 8.2 meters from the sea level. The experiment consisted of two factors *viz.* different mulch materials and foliar application of micronutrients Factor A: Mulch materials M_0=No mulch (control) M_1= Black polyethylene mulch and M_2= Rice straw mulch Factor B: Foliar application of micronutrients N_0= Control (No micronutrients) N_1= Zn @ 0.6% as $ZnSO_4$and N_2= B @ 0.6% as H_3BO_3. The two-factorial experiment was laid out in a Randomized Complete Block Design (RCBD) with three replications the size of unit plot was 1.5 m × 1.2 m. The total number of treatments was 9 and the number of plots were 27.

2.2 Crop/Planting Material

The seed of variety BARI Misti morich-2 was collected from Bangladesh Agricultural Research Institute (BARI), Joydebpur, Gazipur, Bangladesh.

2.3 Application of Manures and Fertilizers

Total amount of organic manure, TSP and MoP were applied during final land preparation and urea was applied at equal three installments i.e. 15, 30 and 45 DAT (days after transplanting). Zinc and boron fertilizer used as a foliar application. Foliar application of zinc and boron micronutrients at three times during vegetative stage, flower initiation stage and fruit setting stage when fruit attained marble shaped.

The following doses of fertilizers and manures were used in this experiment.

2.4 Seed Sowing

Seeds were sown on 3 November 2020 in the seedbed. Sowing was done thinly in lines spaced at 5 cm distance. Seeds were sown at a depth of 2 cm and covered with a fine layer of soil before being lightly watered with a water can. When the seeds germinated, white polythene was used to provide shade to protect the young seedlings from the scorching sun and rain.

2.5 Data Analysis Technique

"The collected data were compiled and tabulated. Statistical analysis was done on various plant characters to find out the significance of variance resulting from the experimental treatments. Data were analyzed using analysis of variance (ANOVA) technique with the help of computer package program MSTAT-C (software) and the mean differences were adjudged by least significant difference test (LSD) as laid out" by Gomez et al. [12].

3. RESULTS AND DISCUSSION

3.1 Plant Height

Statistically significant variation was observed on plant height at 45, 65 and 85 DAT and at harvest due to different mulch materials (Table 1). At harvest, the tallest plant (83.02 cm) was obtained from M_1 (Black polyethylene mulch) treatment and the shortest plant (68.10 cm) was revealed from M_0 (control) treatment. It was revealed that the plant height increased with the increase in days after transplanting (DAT) i.e., 45, 65, 85 DAT and at final harvest. Komla et al. [13] who reported that "the application of organic mulch compared to the control resulted in increased plant height, canopy size and stem diameter in the dry season". Micronutrients showed significant influence on the plant height of sweet pepper at 45, 65, 85 DAT and at final harvest (Table 1). At harvest, the tallest plant (76.99 cm) was observed from N_1 (Zn @ 0.6% as $ZnSO_4$) treatment. On the other hand, the shortest plant (71.25 cm) was observed from N_0 (control) treatment. Assi et al. [14] reported that "to the excelling of the spraying treatment was superior (2 gL^{-1}) which significantly increased in plant height, number of fruit branches, leaf area of plant, dry weight of vegetative group, leaf content of chlorophyll, nitrogen, phosphorus and potassium".

Significant influence was observed on plant height due to the combined effect of different mulch materials and foliar application of micronutrients (Table 3). From the results of the experiment showed that the tallest plant height at harvest (85.73 cm) was observed from the treatment combination of M_1N_1 (Black polyethylene mulch+ Zn @ 0.6% as $ZnSO_4$) treatment. On the other hand, the shortest plant at harvest (61.78 cm) was observed from M_0N_0 (control) treatment combination.

3.2 Number of Leaves per Plant

Significant variation was observed on number of leaves per plant of sweet pepper due to different mulch materials under the experiment (Table 2). At harvest, the maximum number of leaves per plant (131.15) was obtained from M_2 (rice straw mulch) treatment where minimum number of leaves per plant (115.46) was observed from M_0 (control) treatment. Ashrafuzzaman et al. [15] who reported that plant height, number of primary branches, stem base diameter, number of leaves and yield were better for the mulch materials. Number of leaves per plant showed significant variation on due to the influence of foliar application of micronutrients (Table 2). At harvest, the maximum number of leaves per plant (125.83) was observed from N_1 (Zn @ 0.6% as $ZnSO_4$) treatment. On the other hand, the minimum number of leaves per plant (120.74) was observed from N_0 (control) treatment. Harris et al. [16] who found the similar results. They reported that "maximum number of leaves, number of flowers was observed with the foliar application of Boron (H_3BO_3) + Magnesium ($MgSO_4.7H_2O$) at 100 ppm and minimum was found in the control treatment".

3.3 Number of Leaves per Plant

Significant variation was observed on number of leaves per plant of sweet pepper due to different mulch materials under the experiment (Table 2). At harvest, the maximum number of leaves per

plant (131.15) was obtained from M_2 (rice straw mulch) treatment where minimum number of leaves per plant (115.46) was observed from M_0 (control) treatment. Ashrafuzzaman et al. [15] who reported that "plant height, number of primary branches, stem base diameter, number of leaves and yield were better for the mulch materials". Number of leaves per plant showed significant variation on due to the influence of foliar application of micronutrients (Table 2). At harvest, the maximum number of leaves per plant (125.83) was observed from N_1 (Zn @ 0.6% as $ZnSO_4$) treatment. On the other hand, the minimum number of leaves per plant (120.74) was observed from N_0 (control) treatment. Harris et al. [16] who found the similar results. They reported that maximum number of leaves, number of flowers was observed with the foliar application of Boron (H_3BO_3) + Magnesium ($MgSO_4.7H_2O$) at 100 ppm and minimum was found in the control treatment. Combined effect of mulch materials and foliar application of micronutrients significantly influenced by number of leaves per plant (Table 3). At harvest, the maximum number of leaves per plant (135.15) was achieved from M_2N_1(Rice straw mulch + Zn @ 0.6% as $ZnSO_4$) treatment combination. On the other hand, the minimum number of leaves per plant (113.17) was observed from M_0N_0 (control) treatment combination.

3.4 Number of Flowers per Plant

Statistically significant variation on number of flowers per plant of sweet pepper was observed due to different mulch materials (Table 4). The maximum number of flowers per plant (33.19) was observed from M_2 (rice straw mulch) treatment while the minimum number of flowers per plant (25.22) was obtained from M_0 (control) treatment. Significant difference on number of flowers per plant of sweet pepper was observed due to different levels of foliar application of micronutrients (Table 4). It was revealed that the maximum number of flowers per plant (32.25) was obtained from N_2 (B @ 0.6% as H_3BO_3) treatment. On the other hand, the minimum number of flowers per plant (27.90) was observed from N_0 (control) treatment. Harris et al. [16] who observed the similar results. They reported that combined application of B +Mg at 100 ppm was found to be effective in enhancing plant growth, flowering and fruit yield of chilli. Combined effect of mulch materials and micronutrients significantly influenced by number of flowers per plant of sweet pepper (Table 5). From the results of the experiment revealed that the maximum number of flowers per plant of sweet pepper (36.13) was observed from M_2N_2 (rice straw mulch + B @ 0.6% as H_3BO_3) treatment combination. On the other hand, the minimum number of flowers per plant of sweet pepper (23.92) was observed from M_0N_0 (control) treatment combination.

3.5 Number of Fruits per Plant

Significant influence on number of fruits per plant of sweet pepper was observed due to different mulch materials (Table 4). The maximum number of fruits per plant (13.59) was observed from M_2 (rice straw mulch) treatment while the minimum number of fruits per plant (7.90) was obtained from M_0 (control) treatment. Ashrafuzzaman et al. [15] who also observed the similar results. They revealed that mulching produced the fruits with the highest chlorophyll-a, chlorophyll-b and total chlorophyll contents and also increased the number of fruits per plant and yield. Number of fruits per plant of sweet pepper showed significant variation due to different levels of foliar application of micronutrients (Table 4). It was noted that the maximum number of fruits per plant (13.43) was obtained from N_2 (B @ 0.6% as H_3BO_3) treatment. The minimum number of fruits per plant (8.96) was observed from N_0 (control) treatment. Kumar et al. [17] who also revealed the similar result. Thennakoon et al. [18] who reported that about 25% yield increment compared to control treatment when treated with micronutrients such as zinc, boron, copper etc. Combined effect of mulch materials and micronutrients significantly influenced by number of fruits per plant of sweet pepper (Table 5). From the results of the experiment revealed that the maximum number of fruits per plant of sweet pepper (16.92) was observed from M_2N_2 (rice straw mulch + B @ 0.6% as H_3BO_3) treatment combination. On the other hands the minimum number of fruits per plant of sweet pepper (5.83) was observed from M_0N_0 (control) treatment combination

3.6 Length of Fruit

Statistically significant variation on length of fruit of sweet pepper was observed due to varied levels of phosphorus (Table 4). But the maximum length of fruit (9.00 cm) was observed from M_2 (rice straw mulch) treatment while the minimum length of fruit (6.81 cm) was obtained from M_0 (control) treatment. Significant difference on length of fruit per plant of sweet pepper was observed due to varied application of micronutrients (Table 4). It was revealed that the

maximum length of fruit (8.73 cm) was obtained from N_2 (B @0.6% as H_3BO_3) treatment. On the other hands the minimum length of fruit (7.32 cm) was observed from N_0 (control) treatment. Combined effect of mulch materials and foliar application of micronutrients significantly influenced by length of fruit per plant of sweet pepper (Table 5). The maximum length of fruit per plant (10.10 cm) was observed from M_2N_2 (rice straw mulch + B @0.6% as H_3BO_3) treatment combination. On the other hands the minimum length of fruit per plant (6.18 cm) was observed from M_0N_0 (control) treatment combination.

List 1. Doses of fertilizers and manures used in the study

Fertilizers	Manures	Doses (per hectare)
	Cow dung	10 t
Urea		250 kg
TSP		330 kg
MoP		250 kg
Zinc		As par treatment
Borax		As par treatment
Gypsum		110 kg

Table 1. Effect of mulch materials on plant height at different days after transplanting of sweet pepper

Treatments	Number of leaves per plant at			
	45 DAT	65 DAT	85 DAT	Harvest
M_0	8.63 c	17.14 c	32.15 c	68.10 c
M_1	10.27 a	21.69 a	45.53 a	83.02 a
M_2	9.63 b	20.18 b	35.39b	73.26 b
LSD $_{(0.05)}$	0.3953	0.9396	1.3118	1.5882
CV%	4.20	4.82	3.51	2.14
Treatment				
N_0	9.11 b	18.27 b	34.69 b	71.25 b
N_1	9.91 a	20.76 a	39.67 a	76.99 a
N_2	9.50 b	19.98 a	38.71 a	76.14 a
LSD $_{(0.05)}$	0.3953	0.9396	1.3118	1.5882
CV%	4.20	4.82	3.51	2.14

In a column means having similar letter(s) are statistically similar and those having dissimilar letter(s) differ significantly at 0.05 level of probability. Here, N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch

Table 2. Effect of mulch materials on number of leaves per plant at different days after transplanting of sweet pepper

Treatments	Number of leaves per plant at			
	45 DAT	65 DAT	85 DAT	Harvest
M_0	7.46 c	18.57 c	56.89 c	115.46 c
M_1	9.43 b	19.96 b	64.57 b	122.82 b
M_2	10.33 a	23.24 a	70.29 a	131.15 a
LSD $_{(0.05)}$	0.4113	0.9700	0.6883	1.3438
CV%	4.58	4.76	5.09	4.10
Treatment				
N_0	8.38 b	19.05 b	61.66 c	120.74 c
N_1	9.60 a	21.44 a	66.02 a	125.83 a
N_2	9.25 a	21.28 a	64.07 b	122.86 b
LSD $_{(0.05)}$	0.4113	0.9700	0.6883	1.3438
CV%	4.58	4.76	5.09	4.10

In a column means having similar letter(s) are statistically similar and those having dissimilar letter(s) differ significantly at 0.05 level of probability. Here, N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch

Table 3. Combined effect of mulch materials and foliar application of micronutrients on plant height at different days after transplanting of sweet pepper

Treatment Combination	Plant height (cm) at different days after sowing (DAS)				Number of leaves per plant at			
	45 DAS	65 DAS	85 DAS	At final harvest	45 DAS	65DAS	85DAS	At final harvest
M_0N_0	7.77 e	14.19 f	29.19 f	61.78 e	7.02 f	15.66 f	53.23 h	113.17 f
M_0N_1	8.98 d	18.95 de	34.16 d	71.96 d	7.95 e	20.49 cd	60.44 f	117.39 e
M_0N_2	9.13 d	18.28 e	33.10 de	70.58 d	7.41 ef	19.55 de	56.99 g	115.83 e
M_1N_0	10.19 ab	20.93 bc	43.37 b	80.23 b	8.67 d	19.72 de	63.63 e	120.78 d
M_1N_1	10.75 a	22.72 a	47.86 a	85.73 a	9.97 bc	18.72 e	65.18 d	124.96 c
M_1N_2	9.87 bc	21.44 ab	45.37 b	83.11 a	9.67 c	21.44 bc	64.88 d	122.7cd
M_2N_0	9.37 cd	19.69 cde	31.52 e	71.73 d	9.44 c	21.77 bc	68.11 c	128.29 b
M_2N_1	10.00 bc	20.62 bc	37.00 c	73.30 cd	10.88 a	25.11 a	72.44 a	135.15 a
M_2N_2	9.51 bcd	20.23 bcd	37.66 c	74.75 c	10.67 ab	22.85 b	70.34 b	130.02 b
$LSD_{(0.05)}$	0.6847	1.6275	2.2721	2.7508	0.7124	1.6802	1.1922	2.3275
CV%	4.20	4.82	3.51	2.14	4.58	4.76	5.09	4.10

In a column means having similar letter(s) are statistically similar and those having dissimilar letter(s) differ significantly at 0.05 level of probability. Here, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3

Table 4. Effect of mulch materials and foliar application of micronutrients on number of flowers, number of fruits, individual fruit weight, fruit length, yield per hectare, days to first flowering of sweet pepper

Treatment	Number of flower	Number of fruit	Individua-l fruit weight	Length of fruit(cm)	Yield per hectare of land(ton)	Days to first flowering
Mulching						
M_0	25.22 c	7.90 c	70.13 c	12.08 c	29.50 c	52.29 a
M_1	30.61 b	11.11 b	83.02 b	12.69 b	39.50 b	46.88 b
M_2	33.19 a	13.59 a	89.85 a	13.99 a	55.17 a	45.87 c
LSD (0.05)	0.4263	0.4669	1.8237	0.5200	1.0401	0.7140
CV%	3.89	4.30	2.25	4.06	2.51	5.3
Nutrients						
N_0	27.90 c	8.96 c	70.22 c	12.28 c	33.00 c	50.82 a
N_1	28.88 b	10.22 b	84.83 b	12.92 b	43.17 b	47.93 b
N_2	32.25 a	13.43 a	87.95 a	13.57 a	48.00 a	46.29 c
LSD (0.05)	0.4263	0.4669	1.8237	0.5200	1.0401	0.7140
CV%	3.89	4.30	2.25	4.06	2.51	5.3

Here, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3 in a column means having similar letter(s) are statistically similar and those having dissimilar letter(s) differ significantly at 0.05 level of probability

Table 5. Combined effect of mulch materials and foliar application of micronutrients on number of flowers, number of fruits, individual fruit weight, fruit length, yield per hectare days to first flowering, yield per plot of sweet pepper

Treatment Combinations	Number of flowers per plant	Number of fruits per plant	Individual fruit weight(g)	Fruit length(m)	Yield per hectare(ton)	Days to first flowering
M_0N_0	23.92 h	5.83 g	62.66 g	6.18 f	24.50 l	55.55 a
M_0N_1	24.18 h	8.05 f	72.90 ef	7.12 e	31.00 g	51.50 b
M_0N_2	27.57 g	9.83de	74.82 de	7.13 e	33.00 f	49.83 c
M_1N_0	28.62 f	9.30 e	70.27 f	7.69 de	29.00 h	48.33 d
M_1N_1	30.17 e	10.52 d	87.41 c	8.62 bc	41.50 e	46.44 e
M_1N_2	33.05 b	13.53 b	91.39 b	8.97 b	48.00 c	45.87 e
M_2N_0	31.17 d	11.76 c	77.73 d	8.08 cd	45.50 d	48.57 d
M_2N_1	32.29 c	12.10 c	94.18 b	8.82 b	57.00 b	45.87 e
M_2N_2	36.13 a	16.92 a	97.64 a	10.10 a	63.00 a	43.17 f
LSD (0.05)	0.7384	0.8088	3.1588	0.7331	1.8014	1.23
CV%	3.89	4.30	2.25	7.28	2.51	5.30

Here, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3 in a column means having similar letter(s) are statistically similar and those having dissimilar letter(s) differ significantly at 0.05 level of probability

3.7 Individual Fruit Weight per Plant

Significant variation on individual fruit weight per plant was observed due to different mulch materials (Table 4). From the results of the experiment showed that the maximum individual fruit weight per plant (89.85 g) was obtained from M_2 (rice straw mulch) treatment. On the other hand, the minimum individual fruit weight per plant (70.13 g) was obtained from M_0 (control) treatment. Similar result was also observed by Narayan et al. [19] who reported that number of fruits, fruit length, fruit width, fruit weight and fruit yield were significantly influenced by mulch materials. Statistically significant influence on individual fruit weight per plant was observed due to different foliar application of micronutrients under the present experiment (Table 4). The maximum individual fruit weight per plant (87.95 g) was obtained from N_2 (B @0.6% as H_3BO_3) treatment. On the other hands the minimum individual fruit weight per plant (70.22 g) was observed from N_0 (control)treatment. The result of the experiment was in coincided with the

findings of Assi et al. [14]. Khan et al. [20] who reported that "number of fruits per plant, fruit length, fruit weight plant^{-1}, yield t/ha 1000 seed weight were recorded maximum in the plot to which received zinc @ of 3 kg per hectares. It is concluded from the results that foliar application of boron and zinc should be used @ of 3 kg per hectares for better chilli production in the agro-climatic conditions of Swat" [21-24]. Combined effect of mulch materials and foliar application of micronutrients significantly influenced by individual fruit weight per plant (Table 5). From the results of the experiment revealed that the maximum individual fruit weight per plant (97.64 g) was observed from M_2N_2 (rice straw mulch + B @0.6% as H_3BO_3) treatment combination. On the other hand, the minimum individual fruit weight per plant (62.66 g) was observed from M_0N_0 (control) treatment combination.

3.8 Yield per Hectare

Significant variation was observed on yield per hectare of sweet pepper due to different mulch materials under the present study (Fig. 1). From the results of the experiment showed that the maximum yield per hectare (55.17 t) was obtained from M_2 (rice straw mulch) treatment. On the other hand, the minimum yield per hectare (29.50 t) was obtained from M_0 (control) treatment. The result was in coincided with the findings of Yasmin et al. [25] who reported that rice straw mulch treatment produced highest green chilli yield which was 26.94 % increase over no mulch treatment. Statistically significant influence on yield per hectare was observed due to different levels of foliar application of micronutrients (Fig. 2). It was revealed that the minimum yield per hectare (48.00 t) was revealed from N_2 (B @0.6% as H_3BO_3) treatment. On the other hand, the minimum yield per hectare (33.00 t) was obtained from N_0 (control) treatment. The result of the experiment was also coincided with the findings of Ashraf et al. [26] who reported that maximum fruit yield per plant, maximum fruit yield per hectare, highest value of 100 seeds weight were obtained by foliar application of micronutrients.

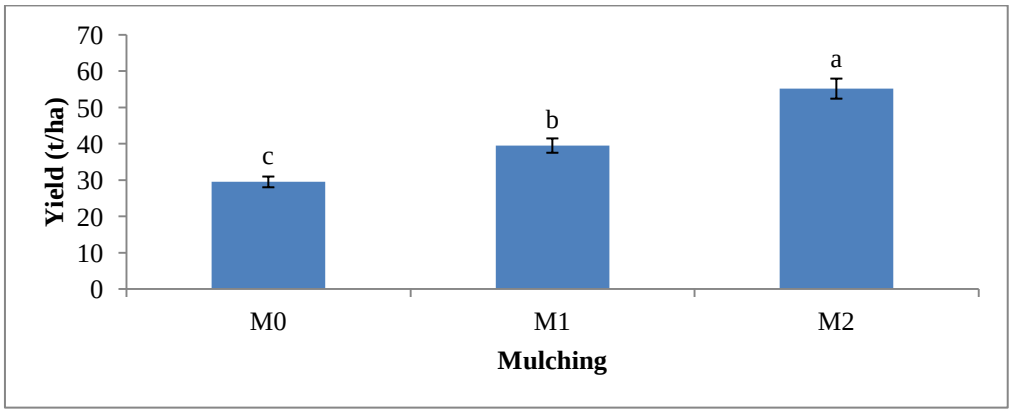

Fig. 1. Effect of mulch materials on yield per hectare of sweet pepper
Here, M_0= Control, M_1= Black polyethylene mulch and M_2= Rice straw mulch

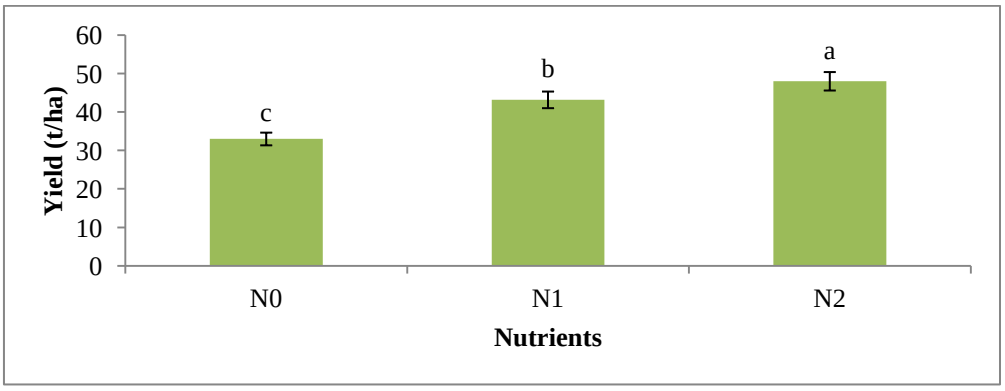

Fig. 2. Effect of foliar application of micronutrients on yield per hectare of sweet pepper
Here, N_0= control, N_1= Zn @ 0.6% as $ZnSO_4$ and N_2= B @ 0.6% as H_3BO_3

Combined effect of mulch materials and foliar application of micronutrients significantly influenced by yield per hectare of sweet pepper (Table 5). From the results of the experiment revealed that the maximum yield per hectare (63.00 t) was observed from M_2N_2 (rice straw mulch + B @0.6% as H_3BO_3) treatment combination (Table. On the other hand, the minimum yield per hectare (24.50 t) was obtained from M_0N_0 (control) treatment combination.

4. CONCLUSION

This study revealed that different mulch materials and foliar application of micronutrients have a positive effect on growth and yield of sweet pepper. In case of yield of sweet pepper, the combination of mulch materials M_2N_2 (Straw mulch) along with foliar application of micronutrients N_2 (B @0.6% as H_3BO_3) were given the better performance of all the yield contributing parameters, yield (63.00 t ha^{-1}) and quality of sweet pepper than the other treatment combinations. So, it can be concluded that farmers will be benefitted by applying rice straw mulch with three times foliar application of B @ 0.6% in capsicum production. But it can be repeated in different agro ecological zones of Bangladesh for better yield and consideration value for money concept.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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