Original Research Article

INFLUENCE OF DIFFERENT TYPES OF MANURE AND CLOVE SIZE ON THE GROWTH AND YIELD OF GARLIC (*Allium salivum* L)

ABSTRACT

In order to determine the effects of various types of manure and clove size on the development and productivity of garlic, an experiment was carried out at the Horticulture farm of Sher-e-Bangla Agricultural University, Dhaka, between November 2021 and April 2022. The experiment consisted of three sizes of garlic cloves (Viz. C_1=small (50gm/100 cloves), C_2=medium (70gm/100 cloves), C_3=large (90gm/100 cloves)) and four levels of manure (Viz. M_0= Control (No manure),M_1= Cowdung (15t/ha), M_2= Vermicompost (6t/ha), M_3=Mushroom spent compost (6t/ha)). The two-factor experiment was carried out in Randomized Complete Block Design (RCBD) with three replications and 12 treatments. Growth and yield of garlic were influenced by the different clove sizes. The C3 treatment had the most leaves (12.77), the largest bulb diameter (4.11 cm), the most cloves per bulb (25.49), the largest clove diameter (1.35 cm), the largest weight of 10 cloves per bulb (13.5 g), and the highest bulb output per hectare (9.43 ton). The growth and yield of garlic were significantly impacted by different level of manure. The M_3 treatment produced the highest number of leaves (12.45), maximum bulb diameter (3.73 cm), highest number of cloves per bulb (24.44), highest diameter of cloves per bulb (1.08 cm), highest weight of 10 cloves per bulb (11.83 g), and highest bulb output per hectare (9.92 ton). The highest bulb yield (11.42 ton/ha) was obtained from M_3C_3 treatment combination, while the lowest bulb yield (5.49 ton/ha) was obtained from M_0C_1 treatment combination. So, it can be revealed that the M_3C_3treatment combination appeared to the best for achieving the higher yield of garlic.

Keywords: garlic, clove size, manure, bulb yield.

I. INTRODUCTION

One of the most significant bulb crops and an aromatic herbaceous annual spice, garlic (*Allium salivum* L.) is a member of the Alliaceae family. After onions, it is the Allium that is used the most frequently. It is well recognized both in Bangladesh and throughout the world as a spice crop [1]. The Mediterranean region, specifically in Central Asia, is where this crop originated. From there, it was extended to China's Pamir-Ali and Tien Shen regions in the north-east. China, South Korea, Spain, India, the United States, Egypt, Thailand, Turkey, Sudan, and Mexico are the top countries in the world for growing garlic [2]. It has long been believed that garlic is a rich source of phosphate, proteins, and carbohydrates.According to Unani and Ayurvedic medicine, garlic is successfully employed in the treatment of illnesses such chronic stomach and bowel infections, dysentery, typhoid, cholera, and disorders of the lungs. Recently, oil and powder made from it have been used to flavor curries. Additionally, it is employed in the production of chutneys, pickles, tomato ketchup, etc. About 90% of garlic is propagated through planting cloves. Garlic's growth and yield are also influenced by the size of the cloves used in planting [3].

For garlic to grow and develop properly, manure must be used. In addition to being a rich source of plant nutrients, manure also enhances the soil's aeration, texture, structure, humus, water-holding ability, and microbial activity, which aids in preserving and boosting soil productivity. Although crops take a while to respond to applied manure, the aftereffects of these organic fertilizers continue for a very long time. Long-term sustainable agriculture depends on maintaining soil fertility, and manure (cowdung, vermicompost, and mushroom waste compost) can play a crucial part in maintaining soil fertility and crop output. A crucial component is organic stuff. It enriches the soil with organic matter, which could enhance soil aeration, moisture retention, structure, and water infiltration [4]. Vermicompost enhances crop output, increases soil water holding capacity, improves soil aeration, and enriches soil with microorganisms [5].

Addition of cowdung in field provide several benefits. Cowdung contain 0.62% N, 0.46% P, 0.59% K, 0.28% S. Vermicompost contain 1.6% N, 0.7% P, 0.8% K, 0.5% Ca. Vermicompost is not only rich in nutrients but it's also loaded with the microorganisms that create and maintain healthy soil. Mushroom compost contains an average of 0.67% P and 1.24% K as well as other plant nutrients such as calcium (2.29%), magnesium (0.35%) and iron (1.07%) [8]. Mushroom spent compost has an excellent 13:1 C:N ratio, indicating outstanding nutrient availability and mature and stable organic

compost. The average pH of mushroom compost is 6.6 is an ideal range for most of the plants. Mushroom spent compost is highly rich in nutrients and it is also loaded with the microorganisms that create and maintain healthy soil. It enriches the soil and supplies nutrients for the healthy growth of the plants.

By assisting farmers in producing high-quality garlic bulbs, this research will both enhance productivity and ensure the farmers' financial well-being. In order to maximize development and yield, this study aims to determine the optimal size of garlic cloves. It also seeks to determine the best combination of NPKS fertilizer, cowdung, vermicompost, and mushroom wasted compost. Determining the combined impact of manure and clove size for the best possible development and yield of garlic is also helpful.

II. MATERIAL AND METHODS

1. Description of the site

Between November 2021 and April 2022, the research was carried out at the Horticulture Farm of the Sher-e-Bangla Agricultural University in Sher-e-Bangla Nagar, Dhaka. The site's coordinates were 23° 77′ N latitude, 90° 35′ E longitude, and it was 8.6 meters above sea level. The test site had a subtropical environment with three different seasons: pre-monsoon or hot season from March to April, and monsoon season from May to October. Winter lasted from November to February. The research site experiences both cold and hot winters. The majority of the year's precipitation, around 490 mm, falls during the monsoon season (30-year period). The mean maximum and lowest temperatures for the year were 28 and 19°C, respectively.

2. Soil sampling and analysis

Soil samples were collected in order to assess the physical and chemical characteristics prior to the experiment. The experimental field's soil has a silty loam texture. The soil in the test location is from AEZ No. 28's Modhupur Tract and is a portion of it. The Soil Resources Development Institute (SRDI), Soil Testing Laboratory, Kamarhati, Dhaka, evaluated the soil sample from the experimental plot, which was taken from a depth of 0 to 30 cm and had a pH of 7.1. It underwent physical and chemical testing after being air dried and crushed.

3. Statistical Analysis

The recorded data on different parameters were statistically analyzed using Statistic 10 software. The significance of the difference among the treatments means was estimated by the least significant difference test (LSD) at 5% level of probability.

4. Field preparation and Treatment allocation

The plot selected for the experiment was opened with a power tiller in the middle of November 2021 and left exposed to the sun for 10 days. To achieve good tilth, the land was harrowed, ploughed, and cross-ploughed several times, followed by laddering. The experiment was laid out in a Randomized Complete Block Design (RCBD) having double factor with three replications. The experiment comprised as two factors. Factor A: clove size(3 levels of clove size(Viz.C_1=small (50gm/100 cloves), C_2=medium (70gm/100 cloves), C_3=large (90gm/100 cloves)) , and Factor B: manure (four levels of fertilizers and manure (Viz. M_0= Control (No manure), M_1= Cowdung (15t/ha), M_2= Vermicompost (6t/ha), M_3=Mushroom spent compost (6t/ha)). Each block was divided into 12 plots where 12 treatments combination were distributed randomly and 36-unit plots altogether in the experiment. The size of each plot was 0.9m × 0.6 m. The distance maintained between two blocks were 0.5 m and two plots were 0.4 m. The plots were raised up to 10 cm.

5. Planting Materials

The seeds of garlic (BARI Garlic-3) were collected from Bangladesh Agricultural Research Institute (BARI), Gazipur.

6. Manuring and Fertilization

The entire quantity of well decomposed cowdung, vermicompost and mushroom spent compost were applied to the respective unit plots as per treatment and the whole amount of Triple super phosphate (TSP), ½ of MP and ½ of urea were applied to the soil during final land preparation of 5 days before

planting. The rest of MP and half of urea were used as top dressing at 30 DAP and rest of urea were applied at 60 DAP. The following recommended doses of inorganic fertilizers (NPKS) were applied to all plots for bulb production in this experiment.

Table 1. The following doses of manure and fertilizers were applied in the experimental plots

Manure and Fertilizers	Doses per hectare (kg)	Doses per respective plot (kg)
Cowdung (M_1)	15000	0.81
Vermicompost (M_2)	6000	0.324
Mushroom Spent Compost (M_3)	6000	0.324
Urea (M_0)	217(99.82 N)	0.012
TSP (M_0)	267 (53.40 P)	0.014
MP (M_0)	333 (166.50 K)	0.018
Gypsum (M_0)	110(19.80 S)	0.005

III. RESULT AND DISCUSSIONS

1. Effect of clove size

Significant differences were found in the different parameters of plant due to different levels of clove size. The maximum plant height (70.23 cm) was measured at 100 DAP from C_3 followed by C_2 treatment (Fig.1). The highest number of leaves (12.45) per plant at 100 DAP was recorded from C_3 treatment which was followed by C_2 treatment (Fig.3). The treatment C_3 recorded the maximum plant base diameter (0.98 cm), length of bulb (3.67 cm), diameter of bulb (4.11cm), number of cloves per bulb (25.51), length of cloves per bulb (2.51 cm), diameter of cloves per bulb (1.35 cm) and weight of 10 cloves per bulb (13.5 g) (Table 2). The maximum fresh weight of leaves per plant (8.78 g), fresh weight of bulb (18.27 g) and fresh weight of roots (0.64 g) (Table 2). The data revealed that highest bulb yield (0.51) per plot, bulb yield (9.43) per hectare was found from C_3 treatment (Table 2).It was revealed that with the increases of clove size plant height showed increasing trend. Large sized clove stored comparatively large amount of nutrients that helps to the development of plant immediate after emergence of seedlings. The present studies are congruentwith [3] who reported that increased vegetative and bulb growth observed in large-sized cloves due tomore reserve nutrients that in turn might increase the overall total dry biomass of garlic.Our findings suggest that garlic growth and yield are directlyrelated to the size of cloves planted. Therefore, plantingcloves of the appropriate size can improve garlic production.Clove size showed significant effects on all growth and yieldparameters of garlic. Hence, it can be tentatively recommended that production of the highest yield of garlic is achieved byusing larger clove [6].

2. Effect of manure

The data revealed that the effectiveness of different types of manure along with NPKS fertilizers affected the growth and yield of garlic. The maximum plant height (70.11cm) at 100 DAP (Fig. 2) and number of leaves per plant (12.45) at 100 DAP (Fig.4) was measured from M_3 treatment followed by M_2 treatment. The treatment M_3 recorded the maximum plant base diameter (0.98 cm), length of bulb (3.53 cm), diameter of bulb (3.73 cm), number of cloves per bulb (24.44), length of cloves per bulb (2.40 cm), diameter of cloves per bulb (1.07 cm) and weight of 10 cloves per bulb (11.83 g) (Table 3). The maximum fresh weight of leaves per plant (8.13 g), fresh weight of bulb (18.89 g) and fresh weight of roots (0.62 g) (Table 3). The data revealed that highest bulb yield (0.54) per plot, bulb yield (9.92) per hectare was found from M_3 treatment (Table 3).[7] reported that the height of plant increased with application of manure. The result might be due to the fact that mushroom spent compost enhances the vegetative growth of garlic. The present findings are agreed with the findings of [8].This ecological inputs provide favorable conditions for plant growth and development through improvement of physical, chemical and biological properties of the soil.

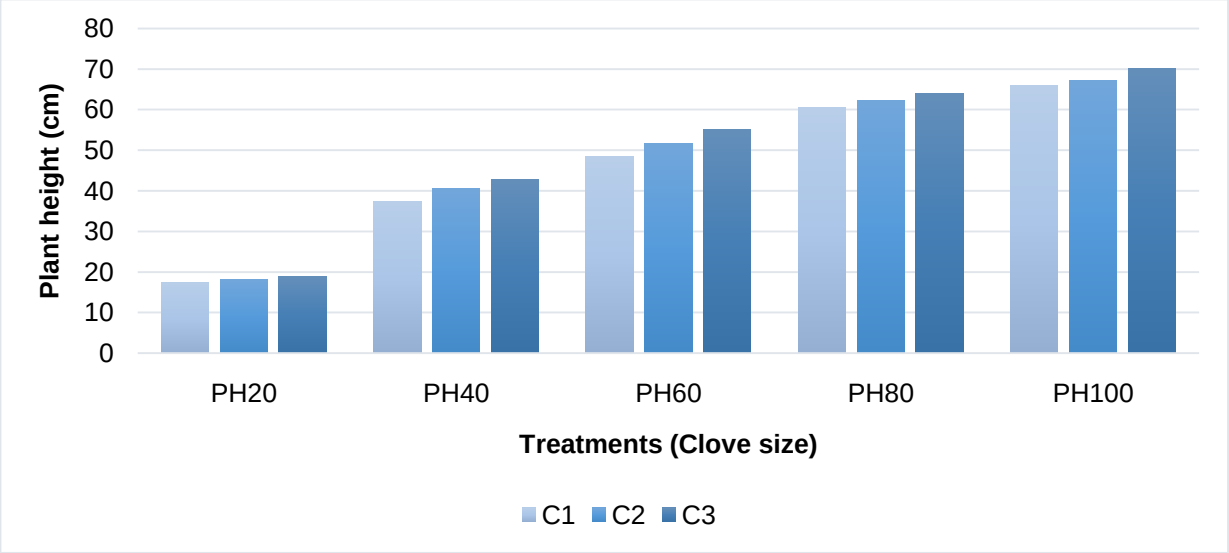

Figure 1. Effect of clove size on plant height (cm) of garlic(*Allium salivum* L)
Here, C_1= small clove size (50gm/100 cloves), C_2= medium clove size (70gm/100 cloves), C_3= large clove size (90gm/100 cloves)

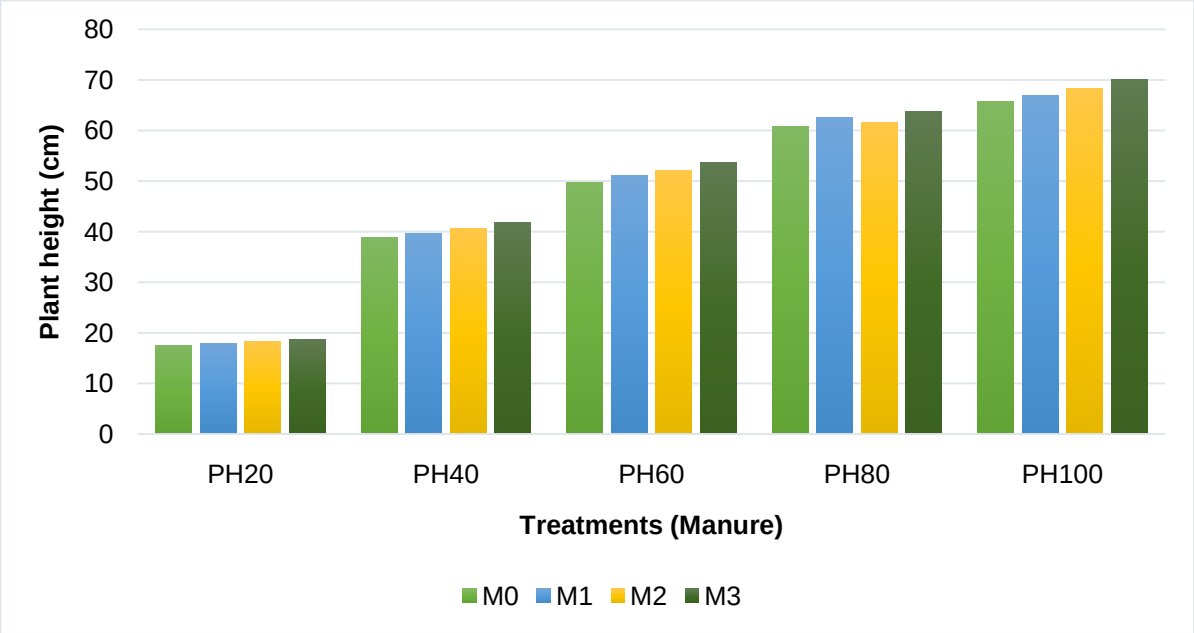

Figure 2. Effect of different types of manure on plant height (cm) of garlic(*Allium salivum* L)
Here, M_0= control (No manure), M_1=cowdung (15t/ha), M_2= vermicompost (6t/ha), M_3= mushroom spent compost (6t/ha)

3. Combined effect of Clove size and Manure

Combined effect of clove size and different types of manure were found to be statistically significant. The maximum plant height (72.5 cm) at 100 DAP was obtained from M_3C_3 treatment combination and number of leaves per plant (13.74) at 100 DAP from M_3C_3 treatment combination (Table 4). The treatment M_3C_3 recorded the maximum plant base diameter (1.05 cm),length of bulb (3.84 cm), diameter of bulb (4.24 cm) (Table 4). Maximum number of cloves per bulb (26.00), length of cloves per bulb (2.59 cm), diameter of cloves per bulb (1.43 cm) and weight of 10 cloves per bulb (13.83 g), maximum fresh weight of leaves per plant (9.32 g), fresh weight of bulb (21.08 g) and fresh weight of

roots (0.69 g) obtained from M_3C_3(Table 5). The data revealed that highest bulb yield (0.62) per plot, bulb yield (11.42) per hectare was found from M_3C_3 treatment(Table 5).
It was revealed that large clove size and mushroom spent compost treatment combinations shows maximum plant height, number of leaves per plant, number of cloves per bulb, bulb yield due to the higher concentration of soil enzymes, soil organic matter and soil for rapid mineralization and transformation of plant nutrients in soil.

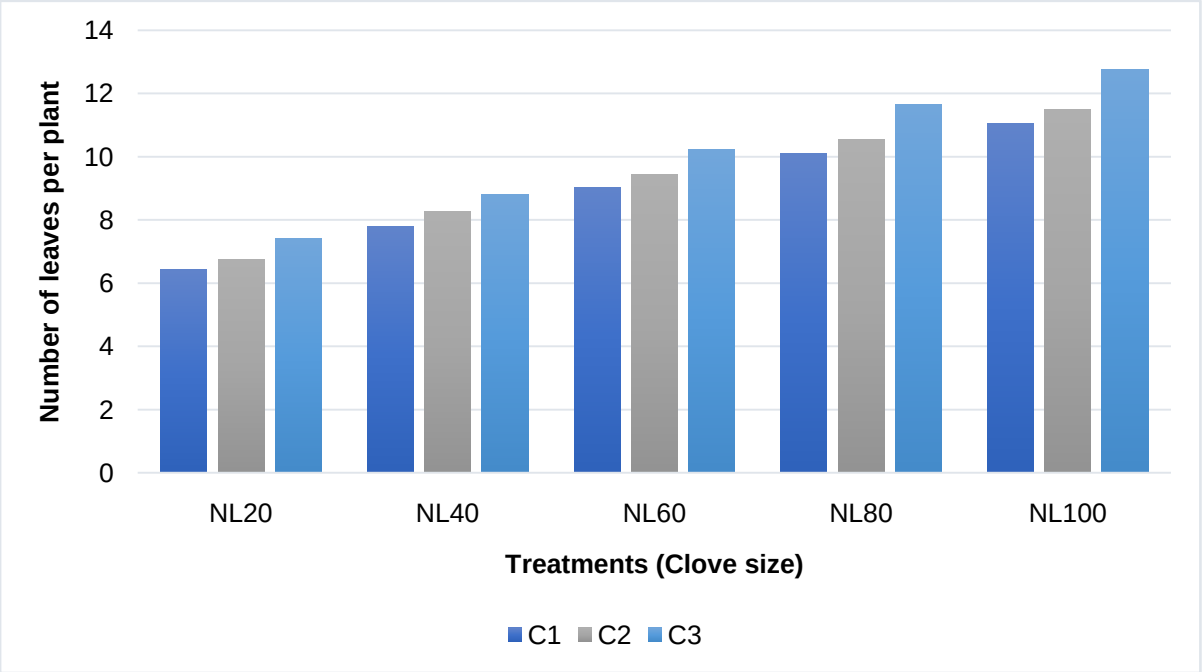

Figure 3. Effect of clove size on number of leaves per plant of garlic(*Allium salivum* L)
Here, C_1= small clove size (50gm/100 cloves), C_2= medium clove size (70gm/100 cloves), C_3= large clove size (90gm/100 cloves)

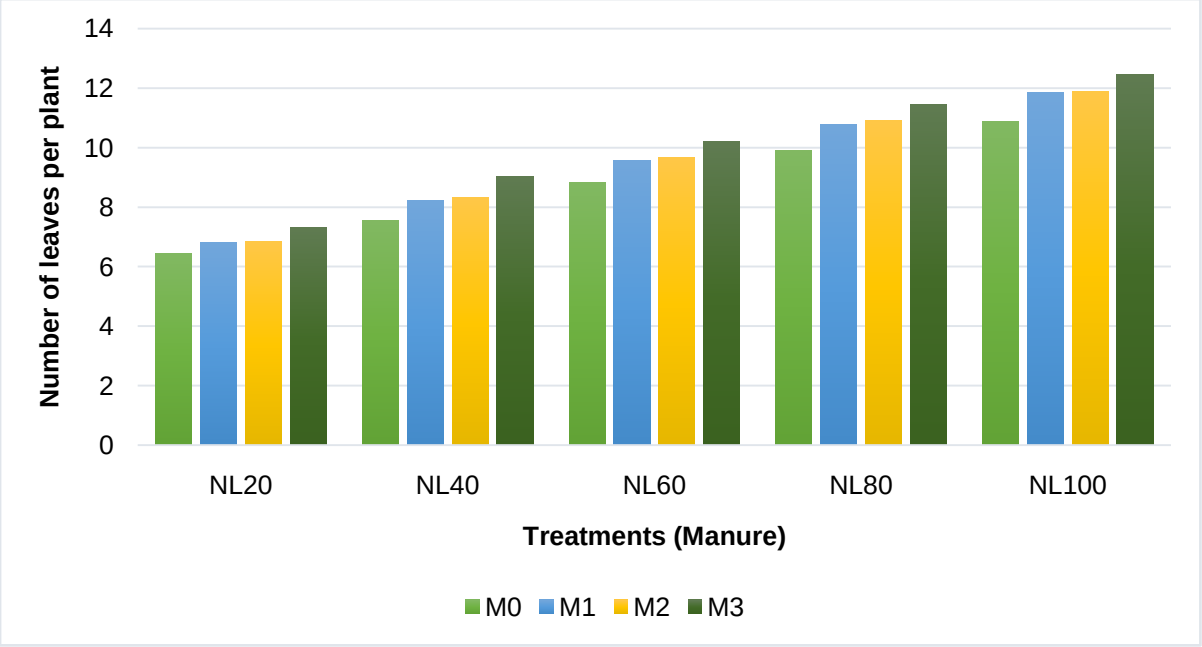

Figure 4. Effect of different types of manure on number of leaves per plant of garlic(*Allium salivum* L)

Here, M_0= control (No manure), M_1=cowdung (15t/ha), M_2= vermicompost (6t/ha), M_3= mushroom spent compost (6t/ha)

Table 2. Effect of clove size on plant base diameter (cm), length of bulb (cm), Diameterof bulb (cm), Length of bulb (cm), Diameter of bulb (cm), number of cloves per bulb, Length of cloves per bulb (cm), Diameter of cloves per bulb (cm), Weight of 10 cloves per bulb (g),Fresh weight of leaves (g), Fresh weight of bulb (g), Fresh weight of roots (g), Yield of bulb per plot (), Yield of bulb per hectare (ton) of garlic(*Allium salivum* L)

Treatment	Plant Base Diameter (cm)	Length of Bulb (cm)	Diameter of Bulb (cm)	No. of cloves per bulb	Length of cloves per bulb (cm)	Diameter of cloves per bulb (cm)	Weight of 10 cloves per bulb (g)	Fresh weight of leaves (g)	Fresh weight of bulb (g)	Fresh weight of roots (g)	Yield of bulb per plot ()	Yield of bulb per hectare (ton)
C_1	0.90 c	2.95 c	3.07 c	21.92c	2.06 c	0.69 c	8.44 c	6.92c	15.10c	0.50c	0.39c	7.22c
C_2	0.94 b	3.52 b	3.69 b	24.42 b	2.37 b	0.99 b	12.04 b	7.60b	16.23b	0.58b	0.43b	7.98b
C_3	0.98 a	3.67 a	4.11 a	25.51 a	2.51 a	1.35 a	13.5 a	8.79a	18.27a	0.64a	0.51a	9.43a
LSD (005)	0.0222	0.0118	0.0357	0.314	0.019	0.0415	0.3648	0.2036	0.2651	0.0199	0.00492	0.0917
CV%	4.87	4.59	5.38	5.24	7.06	6.85	4.85	4.95	7.02	5.24	5.25	5.25

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, C_1= small clove size (50gm/100 cloves), C_2= medium clove size (70gm/100 cloves), C_3= large clove size (90gm/100 cloves)

Table 3. Effect of different types of manure on plant base diameter (cm), length of bulb (cm), Diameterof bulb (cm), Length of bulb (cm), Diameter of bulb (cm), number of cloves per bulb, Length of cloves per bulb (cm), Diameter of cloves per bulb (cm), Weight of 10 cloves per bulb (g),Fresh weight of leaves (g), Fresh weight of bulb (g), Fresh weight of roots (g), Yield of bulb per plot (), Yield of bulb per hectare (ton) of garlic(*Allium salivum* L)

Treatment	Plant Base Diameter (cm)	Length of Bulb (cm)	Diameter of Bulb (cm)	No. of cloves per bulb	Length of cloves per bulb (cm)	Diameter of cloves per bulb (cm)	Weight of 10 cloves per bulb (g)	Fresh weight of leaves (g)	Fresh weight of bulb (g)	Fresh weight of roots (g)	Yield of bulb per plot ()	Yield of bulb per hectare (ton)
M_0	0.9 c	3.23 d	3.49 d	23.34 c	2.23 d	0.95 c	10.81 c	7.39c	13.56d	0.53c	0.33d	6.10d
M_1	0.92 c	3.33 c	3.59 c	23.89 b	2.29 c	1.00 b	11.22 bc	7.69b	15.92c	0.57b	0.43c	7.90c
M_2	0.96 b	3.43 b	3.67 b	24.11ab	2.35 b	1.02 b	11.44 ab	7.86b	17.78b	0.58b	0.48b	8.91b
M_3	0.98 a	3.53 a	3.73 a	24.44 a	2.40 a	1.07 a	11.83 a	8.13a	18.89a	0.62a	0.54a	9.92a
LSD (0.05)	0.0256	0.0137	0.0413	0.3626	0.0219	0.048	0.4213	0.2351	0.3061	0.023	0.00568	0.1059
CV%	4.87	4.59	5.38	5.24	7.06	6.85	4.85	4.95	7.02	5.24	5.25	5.25

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 (No manure), M_1=cowdung (15t/ha), M_2= vermicompost (6t/ha), M_3= mushroom spent compost (6t/ha)

Table 4. Combined effect of different types of manure and clove size on plant base diameter (cm), length of bulb (cm), Diameterof bulb (cm), Length of bulb (cm), Diameter of bulb (cm), number of cloves per bulb, Length of cloves per bulb (cm), Diameter of cloves per bulb (cm), Weight of 10 cloves per bulb (g),Fresh weight of leaves (g), Fresh weight of bulb (g), Fresh weight of roots (g), Yield of bulb per plot (), Yield of bulb per hectare (ton) of garlic(*Allium salivum* L)

Treatment	Plant height (cm) at			Number of leaves at			Plant Base Diameter (cm)	Length of Bulb (cm)	Diameter of bulb (cm)
	60 DAP	80 DAP	100 DAP	60 DAP	80 DAP	100 DAP			
M_0C_1	46.5 i	59.17 j	64.33 j	8.12 g	9.05 f	10.02 f	0.87 g	2.82 l	2.94 j
M_0C_2	49.17 g	60.5 hi	65.17 i	8.67 f	9.67 ef	10.67 ef	0.9 efg	3.39 h	3.59 g
M_0C_3	53.5 d	62.5 de	67.92 e	9.67 cd	11.0 bcd	12.0 bc	0.93 cde	3.49 f	3.97 d
M_1C_1	48.08 h	60.08 i	65.33 i	9.33 de	10.33 de	11.23 de	0.88 fg	2.91 k	3.05 i
M_1C_2	50.75 f	61.75 ef	66.08 h	9.67 cd	10.67 cd	11.68 cd	0.93 cde	3.47 g	3.67 f
M_1C_3	54.42 c	63.17 cd	69.17 d	10.0 bc	11.33 bc	12.67 b	0.95 bcd	3.61 d	4.05 c
M_2C_1	49.08 g	60.92 gh	66.42 gh	9.0 ef	10.33 de	11.33 cde	0.92 def	2.99 j	3.12 h
M_2C_2	51.92 e	62.67 d	67.08 fg	9.33 de	10.75 cd	11.67 cd	0.97 bc	3.55 e	3.73 ef
M_2C_3	55.5 b	64.33 b	71.33 b	10.33 b	11.67 b	12.67 b	0.98 b	3.73 b	4.17 b
M_3C_1	50.25 f	61.67 fg	67.33 ef	9.67 cd	10.67 cd	11.62 cd	0.93 cde	3.08 i	3.18 h
M_3C_2	54.5 c	63.67 bc	70.5 c	10.0 bc	11.07 bc	12.0 bc	0.97 bc	3.67 c	3.78 e
M_3C_3	56.5 a	65.67 a	72.5 a	10.89 a	12.57 a	13.74 a	1.05 a	3.84 a	4.24 a
LSD (0.05)	0.8826	0.7882	0.7229	0.4865	0.6903	0.7431	0.0444	0.0237	0.0715
CV%	8.25	7.25	5.36	7.23	4.02	5.58	4.87	4.59	5.38

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, C_1= small clove size (50gm/100 cloves), C_2= medium clove size (70gm/100 cloves), C_3= large clove size (90gm/100 cloves); M_0= control (No manure), M_1=cowdung (15t/ha), M_2= vermicompost (6t/ha), M_3= mushroom spent compost (6t/ha)

Table 5. Combined effects different types of manure and clove size on plant base diameter (cm), length of bulb (cm), Diameterof bulb (cm), Length of bulb (cm), Diameter of bulb (cm), number of cloves per bulb, Length of cloves per bulb (cm), Diameter of cloves per bulb (cm), Weight of 10 cloves per bulb (g),Fresh weight of leaves (g), Fresh weight of bulb (g), Fresh weight of roots (g), Yield of bulb per plot (), Yield of bulb per hectare (ton) of garlic(*Allium salivum* L)

Treatment	No. of cloves per bulb	Length of cloves per bulb (cm)	Diameter of cloves per bulb (cm)	Weight of 10 cloves per bulb (g)	Fresh weight of leaves (g)	Fresh weight of bulb (g)	Fresh weight of roots (g)	Yield of bulb per plot ()	Yield of bulb per hectare (ton)
M_0C_1	21.33 h	1.98 i	0.65 g	8.08 g	6.67 i	12.08 i	0.45 g	0.29 k	5.49 k
M_0C_2	23.68 f	2.28 f	0.93 e	11.17 e	7.17 gh	13.67 h	0.55 def	0.33 j	6.11 j
M_0C_3	25.0 cd	2.42 d	1.27 c	13.17 ab	8.33 cd	14.92 g	0.58 cd	0.36 i	6.69 i
M_1C_1	22.0 g	2.03 h	0.68 fg	8.33 fg	6.92 hi	14.58 g	0.52 f	0.37 h	6.91 h
M_1C_2	24.33 e	2.34 e	0.98 e	12.0 d	7.5 fg	15.5 f	0.57 de	0.42 g	7.72 g
M_1C_3	25.36 bc	2.5 c	1.35 b	13.33 ab	8.66 bc	17.67 d	0.62 bc	0.49 d	9.07 d
M_2C_1	22.0 g	2.11 g	0.70 fg	8.5 fg	7 hi	16.42 e	0.52 f	0.42 g	7.81 g
M_2C_2	24.67 de	2.39 d	1.0 de	12.16 cd	7.75 ef	17.5 d	0.58 cd	0.45 f	8.39 f
M_2C_3	25.67 ab	2.54 b	1.37 ab	13.67 a	8.83 b	19.42 b	0.65 b	0.57 b	10.53 b
M_3C_1	22.33 g	2.14 g	0.73 f	8.83 f	7.08 h	17.33 d	0.53 ef	0.47 e	8.64 e
M_3C_2	25.0 cd	2.47 c	1.07 d	12.83 bc	8 de	18.25 c	0.63 b	0.52 c	9.69 c
M_3C_3	26.0 a	2.59 a	1.43 a	13.83 a	9.32 a	21.08 a	0.69 a	0.62 a	11.42 a
LSD (0.05)	0.628	0.038	0.0831	0.7297	0.4072	0.5301	0.0398	0.00983	0.1834
CV%	5.24	7.06	6.85	4.85	4.95	7.02	5.24	5.25	5.25

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, C_1= small clove size (50gm/100 cloves), C_2= medium clove size (70gm/100 cloves), C_3= large clove size (90gm/100 cloves); M_0= control (No manure), M_1=cowdung (15t/ha), M_2= vermicompost (6t/ha), M_3= mushroom spent compost (6t/ha)

IV. CONCLUSION

On the basis of present study, it is concluded that the $C_3$and M_3treatment gave highest plant height at 100 DAP of garlic, highest number of leaves, plant base diameter, length of bulb, diameter of bulb, number of cloves per bulb, length of cloves per bulb, weight of 10 cloves per bulb and bulb yield.In this experiment

large clove size C_3 (90gm/100cloves) treatment gave highest bulb yield (9.43/ha) and mushroom spent compost M_3(mushroom spent compost (6t/ha) gave highest yield (9.92 ton/ha)of garlic. Combination of mushroom spent compost with large clove size (M_3C_3) treated plants gave highest growth and bulb yield (11.42 ton /ha) of garlic. However, from the present study it may be concluded that, the most suitable combination for a higher yield of garlic was M_3= mushroom spent compost (6t/ha) with large clove size C_3 (90gm/100 cloves).

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