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*Research Article*

# Effect of Organic Manures and Biofertilizers on Growth Characters of Lilium Growing Under Different Cultivation Practices

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**Abstract**

The present experiment on the effect of organic manures and biofertilizers on growth characters of Lilium growing under different cultivation practices was carried out during 2021-22 and 2022-23 at Agri-tourism Centre, CCS HAU, Hisar (Haryana). The experiment consists of nine treatments, which were replicated three times in a Randomised Blocks Design (RBD). The results of investigation revealed that the treatment applied with FYM @ 5.0 t/ha + VC @ 2.5 t/ha + Azotobacter + PSB (T9) recorded days taken to bulb sprouting (5.41 & 5.68 days), plant height (102.54 & 105.31 cm), number of leaves per plant (70.86 & 72.91), leaf length (9.25 & 9.70 cm), leaf width (2.59 & 2.75 cm). The results show that organic manure could increase vegetative growth in combination with biofertilizers.

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**KEYWORDS:** FYM, Vermicompost, PSB, Azotobacter.

## 1. INTRODUCTION

The genus Lilium is herbaceous flowering plants normally growing from bulbs, comprising of about 130 species in the family Liliaceae, all originating from the Northern Hemisphere (Beattie and White, 1993). The floral industry today has grown to much larger proportions and offers wide scope for growth and profits (Yadawad *et al*., 2011). The recognition of the potential of commercial floriculture has led in the development of this industry into a viable agri-business choice. The range of lilies in the old world extends across much of Europe, across most of Asia to Japan, south to India and east to Indo-China and the Philippines. In early 1990's Lilies were introduced in North India for commercial cultivation by commercial growers like Lake Flowers International, UP, India. Lilium is indigenous to north temperate zones of hemispheres, and the area of distribution stretches through India across the Northern India (Uttarakhand, Uttar Pradesh, Himachal Pradesh, Jammu, and Kashmir), Central India (Pune) and Southern India (Ooty and Banglore). *Lilium longiflorum* is a monocotyledon belonging to liliaceae, it grows well demands in tropical region. All Lilium species are diploid (2n=2x=24), except some triploid forms of *L.tigrinum* and *L.bulbiferum* existing in nature. Due to its size, beauty, and longevity Lilium is one of the ten most superior cut flowers in the world (Thakur et al., 2005). As a cut flower, it is now the fourth most important crop in the Netherlands (Anonymous, 2011). Organic fertilization is an alternative method for lilium production. The organic components improve soil structure and reduce soil temperature, leading in enhanced root development and increased water and nutrient use efficiency (Casale et al., 1995). According to a study conducted by Ramesh et al. (2010), organic manures increase soil quality in terms of a number of indices, such as pH and organic matter content. Physical, chemical, and biological qualities that indicate improved soil health and crop production sustainability. Biofertilizers also play very significant role in improving soil fertility by fixing atmospheric nitrogen, both in association with plant roots and without it, solubilize insoluble soil phosphates and produce plant growth substances in the soil. The concept of nutrient management through different organic manures and biofertilizers is to improve the morphological characters of Lilium.

## 2. MATERIALS AND METHODS

The present investigation, entitled "Effect of organic manures and biofertilizers on growth characters of lilium growing under different cultivation practices" was carried out at Agri-tourism Centre, CCS HAU, Hisar (Haryana) in 2021-22 and 2022-23. The investigation was done for growth parameters. The experiment consists of nine treatments *viz*., $T_1$ RDF (Control); $T_2$ (Farm Yard Manure @ 5.0 t/ha); $T_3$ (Vermicompost @ 2.5 t/ha); $T_4$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha) ; $T_5$ (*Azotobacter* + Phosphate Solubilising Bacteria) ; $T_6$ (RDF + *Azotobacter* + PSB); $T_7$ (FYM @ 5.0 t/ha + *Azotobacter* + PSB); $T_8$ (VC @ 2.5 t/ha + *Azotobacter* + PSB); $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB). The experiment was laid out in Randomized Blocks Design with three replications per treatment.

**Data Collected:**

**Days taken to bulb sprouting**

All the experimental bulbs were observed daily critically for recording the data on bulb sprouting. The data on days taken to bulb sprouting were recorded from the date of bulb planting to the average date on which the first sign of bulb sprout was visible with the naked eye on the soil surface. Such varied dates were recorded on all the experimental bulbs per treatment, and the average data was worked out for each replication.

**Plant height (cm) at harvest**

For this observation, five healthy plants were selected at the harvesting stage of the spike in each treatment. Then, it was measured from the measuring scale.

**Number of leaves per plant at harvest**

For this observation, five healthy plants were selected at the harvesting stage of the spike in each treatment. First, the total number of leaves on these five plants was counted at the full bloom stage. Then, the mean number of leaves per plant was calculated.

**Leaf length (cm) at harvest**

For this observation, five healthy plants were selected at the harvesting stage of the spike in each treatment. First, the length of three leaves (i.e., $4^{th}$ leaf from the base, middle leaf and upper leaf) from the stem base to the tip of the leaf in each plant was measured with the help of a meter rod at the full bloom stage, and then the average length of leaf per plant was calculated for each treatment and expressed in cm.

**Leaf width (cm) at harvest**

For this observation, five healthy plants were selected at the flower harvesting stage in each treatment. The width of three leaves (i.e., $4^{th}$ leaf from the base, middle leaf and upper leaf) from margin to margin at the middle of leaf in each plant was measured with the help of the foot scale at the full bloom stage averaged for each treatment and expressed in cm.

## 3. RESULTS AND DISCUSSION

The minimum days to bulb sprouting (5.12 and 5.37 days), which was followed by shadenet (5.85 and 6.11 days), while the maximum days for bulb sprouting (6.30 and 6.61 days ) were taken when grown under open field conditions. Among different treatments, minimum days to bulb sprouting (5.41 or 5.68 days) under polyhose were observed in $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB treatment) which is followed by $T_8$ (5.50 and 5.77 days)) while maximum (6.34 or 6.65 days) to bulb sprouting were observed in $T_1$ RDF (Control) under open conditions. The interaction between the bio inoculants and growing conditions was found to be significantly influencing the bulb sprouting. Minimum days to bulb sprouting (4.37 and 4.59 days) was observed in polyhouse ($T_9C_1$), while Maximum days to bulb sprouting (6.58 and 6.65) was recorded in ($T_1C_3$) in open conditions. Similar results were also reported by Palai (2009) in chrysanthemum and Mohanty *et al.* (2011) in rose.

The maximum plant height (109.13 and 112.01 cm) was recorded when produced under polyhouse, followed by shadenet (101.95 and 105.40 cm) conditions. In contrast, the minimum plant height (76.30 and 79.04 cm) was recorded when grown under open field conditions. Among the various treatments, maximum plant height (102.54 and 105.31cm) was observed in treatment $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB), and it was followed by $T_8$ (100.25 and 102.57 cm), whereas minimum height (87.81 and 89.83 cm)was observed in treatment $T_1$ (RDF, control) under open field conditions. The interaction between growing conditions and bio inoculants was also found to be significantly influencing the plant height. Maximum plant height (115.30 and 117.61 cm) was observed in polyhouse ($T_9C_1$), hile minimum plant height (63.95 and 65.55 cm) was recorded in ($T_1C_3$) in open conditions. This might be due to a change in leaf morphology, wherein plants grown in shadenet developed large thin leaves with lesser stomata to compensate for the loss in light intensity by increasing the surface area for the process of photosynthesis **(**Fatmi *et al.*, 2018). This finding also got support from Kumari *et al*. (2019) in lily.

The maximum number of leaves (72.12 and 73.92) per plant, which was followed by when grown under shadenet (67.62 and 69.65). In contrast, the minimum numbers of leaves (62.74 and 64.75) per plant were observed when grown under open field conditions. Among the various treatments, maximum number of leaves per plant (70.86 and 72.91) was observed in treatment $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB), and it was followed by $T_8$ (69.11 and 71.11), whereas minimum number of leaves per plant (63.62 and 65.46) was observed in treatment $T_1$ (RDF, control) under open field conditions. The interaction between growing conditions and bio inoculants was also found to be significantly influencing the number of leaves per plant. Maximum number of leaves per plant (75.05 and 76.93) was observed in polyhouse ($T_9C_1$), while minimum number of leaves per plant (59.70 and 61.61) was recorded in ($T_1C_3$) in open conditions. *Azotobacter* and PSB in combined inoculation mutually benefitted each other by supplying essential nutrients for their proper activity. Hence, they showed effective growth on these vegetative parameters. These findings are in conformity with the findings of Kumar *et al*. (2006) and Syamal *et al*. (2006) in marigold and Praneetha *et al*. (2007) in tuberose.

The maximum leaf length (cm) (7.96 and 8.36 cm) was recorded when produced under polyhouse, followed by shadenet (10.04 and 10.50 cm) conditions. In contrast, the minimum leaf length (7.22 and 7.59 cm) was recorded when grown under open field conditions. Among the various treatments, maximum leaf length (9.25 and 9.70 cm) was observed in treatment $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB), and it was followed by $T_8$ (9.15 and 9.59 cm), whereas minimum leaf length (7.05 and 7.39 cm) was observed in treatment $T_1$ (Control) under open field conditions.The interaction between growing conditions and bio inoculants was also found to be significantly influencing the leaf length. Maximum leaf length (8.65 and 9.08 cm) was observed in polyhouse ($T_9C_1$), while minimum leaf length (6.29 and 6.61 cm) was recorded in ($T_1C_3$) in open conditions. This might be due to the optimum nutrition provided by the bio inoculants.

The maximum leaf width (2.36 and 2.50 cm) was recorded when produced under polyhouse, followed by shadenet (2.70 and 2.87 cm) conditions. In contrast, the minimum leaf length (1.99 and 2.12 cm) was recorded when grown under open field conditions. Among the various treatments, maximum leaf width (2.59 and 2.75cm) was observed in treatment $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB), and it was followed by $T_8$ (2.50 and 2.66 cm), whereas minimum leaf width (1.94 and 2.06 cm) was observed in treatment $T_1$ (Control) under open field conditions. The interaction between growing conditions and bio inoculants was also found to be significantly influencing the leaf width (cm). Maximum leaf width (cm) (2.57 and 2.72 cm) was observed in polyhouse ($T_9C_1$), while minimum leaf width (1.55 and 1.64 cm) was recorded in ($T_1C_3$) in open conditions. This might be due to a sufficient supply of nutrients with a favourable growing environment.

**Table 4.1** Effect of growing conditions and bio-inoculants on days taken to bulb sprouting

| Treatments | | | Growing conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $C_1$: Poly House | | $C_2$: Shade net | | $C_3$: Open | | Mean | |
| | | | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 |
| $T_1$ | RDF (Control) | 9 | 5.98 | 6.28 | 6.47 | 6.76 | 6.58 | 6.91 | 6.34 | 6.65 |
| $T_2$ | Farm Yard Manure (FYM) @ 5.0 t/ha | 8 | 5.81 | 6.10 | 6.39 | 6.68 | 6.45 | 6.77 | 6.22 | 6.52 |
| $T_3$ | Vermicompost (VC) @ 2.5 t/ha | 6 | 5.20 | 5.46 | 5.79 | 6.05 | 6.11 | 6.42 | 5.70 | 5.98 |
| $T_4$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha | 4 | 4.88 | 5.12 | 5.70 | 5.96 | 6.24 | 6.55 | 5.61 | 5.88 |
| $T_5$ | *Azotobacter* + Phosphate Solubilising Bacteria (PSB) | 7 | 5.34 | 5.61 | 5.90 | 6.17 | 6.08 | 6.38 | 5.77 | 6.05 |
| $T_6$ | RDF + *Azotobacter* + PSB | 5 | 5.07 | 5.32 | 5.78 | 6.04 | 6.16 | 6.47 | 5.67 | 5.94 |
| $T_7$ | FYM @ 5.0 t/ha + *Azotobacter* + PSB | 3 | 4.80 | 5.04 | 5.59 | 5.84 | 6.30 | 6.62 | 5.56 | 5.83 |
| $T_8$ | VC @ 2.5 t/ha) + *Azotobacter* + PSB | 2 | 4.62 | 4.85 | 5.53 | 5.78 | 6.35 | 6.67 | 5.50 | 5.77 |
| $T_9$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB | 1 | 4.37 | 4.59 | 5.48 | 5.73 | 6.39 | 6.71 | 5.41 | 5.68 |
| | **Mean** | | 5.12 | 5.37 | 5.85 | 6.11 | 6.30 | 6.61 | | |
| | **CD at 5%** | | **Treatments (2021-22) = 0.23, Treatments (2022-23) = 0.28<br>Growing Conditions (2021-22) =0.14, Growing Conditions (2022-23) = 0.18<br>TxC (2021-22) = 0.40, TxC (2022-23) = 0.46** | | | | | | | |

**Table 4.2** Effect of growing conditions and bioinoculants on plant height (cm) at harvest

| Treatments | | | Growing conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $C_1$: Poly House | | $C_2$: Shade net | | $C_3$: Open | | Mean | |
| | | | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 |
| $T_1$ | RDF (Control) | 9 | 105.00 | 107.10 | 94.48 | 96.84 | 63.95 | 65.55 | 87.81 | 89.83 |
| $T_2$ | Farm Yard Manure (FYM) @ 5.0 t/ha | 8 | 106.32 | 108.45 | 97.07 | 99.50 | 70.75 | 72.52 | 91.38 | 93.49 |
| $T_3$ | Vermicompost (VC) @ 2.5 t/ha | 6 | 109.12 | 111.30 | 103.30 | 105.88 | 77.94 | 79.89 | 94.09 | 99.02 |
| $T_4$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha | 4 | 110.51 | 112.72 | 105.42 | 108.06 | 80.01 | 82.01 | 97.95 | 100.93 |
| $T_5$ | *Azotobacter* + Phosphate Solubilising Bacteria (PSB) | 7 | 107.53 | 109.68 | 97.30 | 99.73 | 77.45 | 79.39 | 96.79 | 96.27 |
| $T_6$ | RDF + *Azotobacter* + PSB | 5 | 110.20 | 112.40 | 104.99 | 107.61 | 78.65 | 80.62 | 99.40 | 100.21 |
| $T_7$ | FYM @ 5.0 t/ha + *Azotobacter* + PSB | 3 | 111.94 | 114.18 | 105.89 | 108.54 | 80.37 | 82.38 | 98.64 | 101.70 |
| $T_8$ | VC @ 2.5 t/ha) + *Azotobacter* + PSB | 2 | 112.40 | 114.65 | 107.13 | 109.81 | 81.23 | 83.26 | 100.25 | 102.57 |
| $T_9$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB | 1 | 115.30 | 117.61 | 109.86 | 112.61 | 83.62 | 85.71 | 102.54 | 105.31 |
| | **Mean** | | 109.13 | 112.01 | 101.95 | 105.40 | 76.30 | 79.04 | | |
| | **CD at 5%** | | **Treatments (2021-22) = 0.66, Treatments (2022-23) = 0.74 Growing Conditions (2021-22) =0.40, Growing Conditions (2022-23) = 0.48 TxC (2021-22) = 1.13, TxC (2022-23) = 1.21** | | | | | | | |

**Table 4.3** Effect of growing conditions and bioinoculants on the number of leaves per plant

| Treatments | | | Growing conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $C_1$: Poly House | | $C_2$: Shade net | | $C_3$: Open | | Mean | |
| | | | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 |
| $T_1$ | RDF (Control) | 9 | 68.09 | 69.79 | 63.08 | 64.97 | 59.70 | 61.61 | 63.62 | 65.46 |
| $T_2$ | Farm Yard Manure (FYM) @ 5.0 t/ha | 8 | 70.55 | 72.31 | 65.70 | 67.67 | 61.63 | 63.60 | 65.96 | 67.86 |
| $T_3$ | Vermicompost (VC) @ 2.5 t/ha | 6 | 72.23 | 74.04 | 66.61 | 68.61 | 62.37 | 64.37 | 67.07 | 69.01 |
| $T_4$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha | 4 | 72.70 | 74.52 | 68.90 | 70.97 | 62.90 | 64.91 | 68.17 | 70.13 |
| $T_5$ | *Azotobacter* + Phosphate Solubilising Bacteria (PSB) | 7 | 71.34 | 73.12 | 66.24 | 68.23 | 61.90 | 63.88 | 66.49 | 68.41 |
| $T_6$ | RDF + *Azotobacter* + PSB | 5 | 72.40 | 74.21 | 67.38 | 69.40 | 62.70 | 64.71 | 67.49 | 69.44 |
| $T_7$ | FYM @ 5.0 t/ha + *Azotobacter* + PSB | 3 | 73.19 | 75.02 | 69.37 | 71.45 | 63.42 | 65.45 | 68.66 | 70.64 |
| $T_8$ | VC @ 2.5 t/ha) + *Azotobacter* + PSB | 2 | 73.50 | 75.34 | 69.66 | 71.75 | 64.18 | 66.23 | 69.11 | 71.11 |
| $T_9$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB | 1 | 75.05 | 76.93 | 71.65 | 73.80 | 65.89 | 68.00 | 70.86 | 72.91 |
| | **Mean** | | 72.12 | 73.92 | 67.62 | 69.65 | 62.74 | 64.75 | | |
| | **CD at 5%** | | **Treatments (2021-22) = 0.24, Treatments (2022-23) = 0.32 Growing Conditions (2021-22) =0.15, Growing Conditions (2022-23) = 0.21 TxC (2021-22) = 0.42, TxC (2022-23) = 0.54** | | | | | | | |

**Table 4.4** Effect of growing conditions and bioinoculants on leaf length (cm) at harvest

| Treatments | | | Growing conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $C_1$: Poly House | | $C_2$: Shade net | | $C_3$: Open | | Mean | |
| | | | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 |
| $T_1$ | RDF (Control) | 9 | 6.91 | 7.26 | 7.94 | 8.31 | 6.29 | 6.61 | 7.05 | 7.39 |
| $T_2$ | Farm Yard Manure (FYM) @ 5.0 t/ha | 8 | 7.63 | 8.01 | 8.69 | 9.09 | 7.10 | 7.46 | 7.81 | 8.19 |
| $T_3$ | Vermicompost (VC) @ 2.5 t/ha | 6 | 7.80 | 8.19 | 9.22 | 9.64 | 7.22 | 7.59 | 8.08 | 8.47 |
| $T_4$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha | 4 | 8.13 | 8.54 | 11.04 | 11.55 | 7.35 | 7.72 | 8.84 | 9.27 |
| $T_5$ | *Azotobacter* + Phosphate Solubilising Bacteria (PSB) | 7 | 7.70 | 8.09 | 8.79 | 9.19 | 7.15 | 7.51 | 7.88 | 8.26 |
| $T_6$ | RDF + *Azotobacter* + PSB | 5 | 8.01 | 8.41 | 10.59 | 11.08 | 7.28 | 7.65 | 8.63 | 9.05 |
| $T_7$ | FYM @ 5.0 t/ha + *Azotobacter* + PSB | 3 | 8.27 | 8.68 | 11.27 | 11.79 | 7.44 | 7.82 | 8.99 | 9.43 |
| $T_8$ | VC @ 2.5 t/ha) + *Azotobacter* + PSB | 2 | 8.55 | 8.98 | 11.37 | 11.89 | 7.53 | 7.91 | 9.15 | 9.59 |
| $T_9$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB | 1 | 8.65 | 9.08 | 11.47 | 12.00 | 7.64 | 8.03 | 9.25 | 9.70 |
| | **Mean** | | 7.96 | 8.36 | 10.04 | 10.50 | 7.22 | 7.59 | | |
| | **CD at 5%** | | **Treatments (2021-22) = 0.38, Treatments (2022-23) = 0.45 Growing Conditions (2021-22) =0.24, Growing Conditions (2022-23) = 0.33 TxC (2021-22) = 0.65, TxC (2022-23) = 0.76** | | | | | | | |

**Table 4.5** Effect of growing conditions and bioinoculants on leaf width (cm) at harvest

| Treatments | | | Growing conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $C_1$: Poly House | | $C_2$: Shade net | | $C_3$: Open | | Mean | |
| | | | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 | 2021-22 | 2022-23 |
| $T_1$ | RDF (Control) | 9 | 1.99 | 2.11 | 2.29 | 2.43 | 1.55 | 1.64 | 1.94 | 2.06 |
| $T_2$ | Farm Yard Manure (FYM) @ 5.0 t/ha | 8 | 2.28 | 2.42 | 2.59 | 2.75 | 1.86 | 1.97 | 2.24 | 2.38 |
| $T_3$ | Vermicompost (VC) @ 2.5 t/ha | 6 | 2.35 | 2.49 | 2.68 | 2.85 | 1.96 | 2.08 | 2.33 | 2.47 |
| $T_4$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha | 4 | 2.41 | 2.55 | 2.78 | 2.95 | 2.07 | 2.20 | 2.42 | 2.57 |
| $T_5$ | *Azotobacter* + Phosphate Solubilising Bacteria (PSB) | 7 | 2.31 | 2.45 | 2.63 | 2.79 | 1.92 | 2.04 | 2.29 | 2.43 |
| $T_6$ | RDF + *Azotobacter* + PSB | 5 | 2.39 | 2.53 | 2.73 | 2.90 | 2.04 | 2.16 | 2.39 | 2.53 |
| $T_7$ | FYM @ 5.0 t/ha + *Azotobacter* + PSB | 3 | 2.45 | 2.60 | 2.82 | 2.99 | 2.13 | 2.26 | 2.47 | 2.62 |
| $T_8$ | VC @ 2.5 t/ha) + *Azotobacter* + PSB | 2 | 2.48 | 2.63 | 2.85 | 3.03 | 2.18 | 2.31 | 2.50 | 2.66 |
| $T_9$ | FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB | 1 | 2.57 | 2.72 | 2.96 | 3.14 | 2.24 | 2.38 | 2.59 | 2.75 |
| | **Mean** | | 2.36 | 2.50 | 2.70 | 2.87 | 1.99 | 2.12 | | |
| | **CD at 5%** | | **Treatments (2021-22) = 0.15, Treatments (2022-23) = 0.18<br>Growing Conditions (2021-22) =0.10, Growing Conditions (2022-23) = 0.14<br>TxC (2021-22) = NS, TxC (2022-23) = 0.NS** | | | | | | | |

## 4. CONCLUSION

From the present investigation, it has been concluded that Out of the three growing conditions, Asiatic Lilium cultivated under polyhouse was observed to be performing better in vegetative growth in the shadenet as well as open field conditions both the years, resulting in days taken to bulb sprouting, plant height at harvest, number of leaves per plant, leaf length at harvest, leaf width at harvest, was also observed under polyhouse. All the vegetative characters were found to be best in treatment $T_9$ (FYM @ 5.0 t/ha + VC @ 2.5 t/ha + *Azotobacter* + PSB).

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