

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(7): 53-57
www.biochemjournal.com
Received: 21-04-2026
Accepted: 24-05-2026

Kivi H Yeptho
Ph.D. Scholar, Department of Horticulture (Floriculture and Landscaping), School of Agricultural Sciences, Medziphema Campus, Nagaland University, Nagaland, India

Dr. Rokolhuü Kreditsu
Associate Professor, Department of Horticulture (FLS), SAS, Medziphema Campus, Nagaland University, Nagaland, India

Dr. L Hemanta
Assistant Professor, Department of Horticulture (FLS), SAS, Medziphema Campus, Nagaland University, Nagaland, India

Dr. A Sarkar
Associate Professor, Department of Horticulture (FSC), SAS, Medziphema Campus, Nagaland University, Nagaland, India

Dr. Graceli I Yepthomi
Assistant Professor, Department of Horticulture (PSMA), SAS, Medziphema Campus, Nagaland University, Nagaland, India

Dr. AK Singh
Professor, Department of Soil Science, SAS, Medziphema campus, Nagaland University, Nagaland, India

Corresponding Author:
Kivi H Yeptho
Ph.D. Scholar, Department of Horticulture (Floriculture and Landscaping), School of Agricultural Sciences, Medziphema Campus, Nagaland University, Nagaland, India

Performance of baby's breath (*Gypsophila paniculata* L.) Cv. Star World to different INM packages under foot hill conditions of Nagaland

Kivi H Yeptho, Rokolhuü Kreditsu, L Hemanta, A Sarkar, Graceli I Yepthomi and AK Singh

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i7Sa.8931>

Abstract

A study entitled "Performance of baby's breath (*Gypsophila paniculata* L.) Cv. Star World to different INM packages under foot hill conditions of Nagaland" was conducted during 2023-24 and 2024-25 in the Experimental cum Research Farm, School of Agricultural Sciences, Nagaland University, Medziphema Campus, Nagaland. The study followed a Randomized Block Design (RBD) with 12 treatments and 3 replications. The treatments were T₀-Control, T₁-100% RDF (NPK @ 100-40-60 kg ha⁻¹), T₂-50% RDF + FYM @ 10 t ha⁻¹, T₃-25% RDF + FYM @ 15 t ha⁻¹, T₄-50% RDF + bamboo groove top soil @ 2.91 t ha⁻¹, T₅-25% RDF + bamboo groove top soil @ 4.36 t ha⁻¹, T₆-50% RDF + used tea leaves @ 1.37 t ha⁻¹, T₇-25% RDF + used tea leaves @ 2.06 t ha⁻¹, T₈-50% RDF + spent mushroom compost @ 1.82 t ha⁻¹, T₉-25% RDF + spent mushroom compost @ 2.73 t ha⁻¹, T₁₀-50% RDF + banana peel compost @ 2.55 t ha⁻¹, T₁₁-25% RDF + banana peel compost @ 3.83 t ha⁻¹. Treatment T₂ (50% RDF + FYM @ 10 t ha⁻¹) exhibited the highest value in vegetative parameters such as plant height (20.83 cm, 29.86 cm, 48.33 cm and 83.96 cm at 30, 60, 90, 120 DAT), number of primary branches (8.12, 12.67 and 13.98 at 30, 60, 90 DAT) and internodal length (6.68 cm). Likewise, T₂ recorded earliness to flower bud initiation (77.37 days), opening of florets (95.81 days) and shortest duration to 50% flower opening (107.62 days). It also significantly influenced the number of flowers per branch (335.47), number of flowers per plant (3511.50) and number of cut flower stem per plant (12.39). The results revealed that combined application of organic manures and inorganic fertilizers influences the growth, flowering and yield of baby's breath while safeguarding the soil health as well as making it a feasible approach for sustainable production of baby's breath in the foot hills of Nagaland.

Keywords: Baby's breath, FYM, Growth, INM and yield

1. Introduction

Gypsophila (*Gypsophila paniculata* L.) commonly known as baby's-breath, is one of the most valued ornamental beauty and popular cut flower all over the world for its delicate texture and versatility. It belongs to family 'Caryophyllaceae' and is native to Central and Eastern Europe. The genus name comes from the Greek *gypos* meaning "gypsum" and *philos* meaning "friendship". The common name 'baby's breath' comes from the cloud-like appearance of the plant when it bears flowers (Charters, 2015) [2]. The gypsophila cut flower is considered as one among the mainstay filler plant in the floral industry that is used both for fresh and dried floral arrangements. *Gypsophila* has low nutrient requirement and requires frequent irrigation following planting to avoid moisture stress. Once established, gypsophila is relatively drought tolerant due to its deep root system and requires a day length period of 12-18 hours to initiate flowering (Halevy, 2003) [6].

Application of chemical fertilizers may show promising yield and higher returns, but over the years it leaves an adverse effect on soil structure, soil organic matter degradation, unstable production as well as water, air and soil pollution which is a concerning alarm for need to consider sustainability farming practices i.e. Integrated nutrient management (INM). Sharma *et al.* (2017) [16] stated that integrated nutrient management not only reduced the cost of cultivation but also results in quality assurance of the crop as well as helps in maintaining the soil fertility.

Organic manures inclusion in the soil has the advantage of directly supplying nutrients to the crop for sustained production (Kumar and Chaudhary, 2018) ^[8] improving crop yield and soil fertility (Bhavani *et al.*, 2017) ^[1] and indirectly modifies soil physical properties, creating an improved root environment that stimulates plant growth (Darwish *et al.*, 1995) ^[3].

Farmyard manure (FYM) is cheap and easily available and is considered as a good source of organic carbon, which activates the biotic life of the soil flora and fauna (Ghoshal and Singh, 1995) ^[5]. It supplies all the essential plant nutrients that are vital for plant growth and development. Spent mushroom compost (SMC) is an excellent source of humus with high organic matter content. It can be used in soils with a low pH as soil acidity neutraliser. The generated SMC can potentially be used as an organic fertilizer and its application as soil amendment showed a significant improvement in soil properties, soil NPK, soil beneficial micro-organisms and restoring soil fertility (Mwangi *et al.*, 2024) ^[12]. Used tea leaves is easily available waste item in any household and studies have shown that it can be directly applied to the soil after proper cleaning and drying as an organic source of nutrients to plants (Ranjan *et al.*, 2023) ^[14]. Leftover tea leaves when added to plants not only enhanced the supply of nutrients to plants but also acted as an ideal soil conditioner via microbial activity (Wazir *et al.*, 2018) ^[17]. Banana peels potentially contribute to sustainable waste management in agriculture as it is enriched with macronutrients, micronutrients and bioactive compounds. Abundant minerals found in the peel are phosphorus and potassium (Yasin *et al.*, 2025) ^[18]. Banana peels are highly biodegradable and offers rich stores of vital nutrients to the soil which can be easily make available for plant uptake. Banana peels contain manganese which helps in photosynthesis process; sodium, which helps in the movement of water between cells; magnesium and sulphur, both of which are helpful in the formation of chlorophyll; calcium, which helps plants to take up more nitrogen (Kristi, 2018) ^[7].

Nagaland's traditional farming system uses little to no chemical inputs describing it as "organic by default". *Gypsophila* has acclaimed as a great value cut flower in Nagaland and has greater potential of quality produce, higher employment opportunities in rural and urban areas with higher economic returns because of its wider adaptability and ease of cultivation in the region. Therefore, mindful of the above points, this experiment supports the importance of conducting sustainable INM packages for *gypsophila* to meet the ever-growing demand of markets under foot hill conditions of Nagaland.

2. Materials and Methods

The study entitled "Performance of baby's breath (*Gypsophila paniculata* L.) Cv. Star World to different INM packages under foot hill conditions of Nagaland" was conducted during 2023-24 and 2024-2025 in the Experimental cum Research Farm, School of Agricultural Sciences, Nagaland University, Medziphema Campus, Nagaland. The experimental site is located at 20°45'43" N latitude and 95°53'04" E longitude at an altitude of 305 m above mean sea level. The mean temperature of the location ranges from 25 °C to 32 °C during summer and rarely goes below 8 °C in winter due to high atmospheric humidity with an average rainfall ranging from 2000-2500 mm annually.

The healthy tissue cultured plants of *Gypsophila paniculata* L. Cv. Star World were procured from Kohima Agro Centre, Kohima (Nagaland) and were left for hardening for about 3 weeks in low-cost polyhouse before transplanting it to the main field. The land was brought to a fine tilth by thorough ploughing and experimental plot was prepared as per the layout plan. The plot size was 2.0 m × 1.2 m and spacing followed was 50 cm × 30 cm. The experiment was laid out in Randomized Block Design (RBD) with 12 treatments and each treatment replicated thrice. The treatments consisted of different combinations of inorganic fertilizer (NPK) and organic fertilizers (FYM, bamboo groove top soil, used tea leaves, spent mushroom compost and banana peel compost) and control (No fertilizers and manures). The treatments involved were: T₀-Control, T₁-100% RDF (NPK @ 100-40-60 kg ha⁻¹), T₂-50% RDF + FYM @ 10 t ha⁻¹, T₃-25% RDF + FYM @ 15 t ha⁻¹, T₄-50% RDF + bamboo groove top soil @ 2.91 t ha⁻¹, T₅-25% RDF + bamboo groove top soil @ 4.36 t ha⁻¹, T₆-50% RDF + used tea leaves @ 1.37 t ha⁻¹, T₇-25% RDF + used tea leaves @ 2.06 t ha⁻¹, T₈-50% RDF + spent mushroom compost @ 1.82 t ha⁻¹, T₉-25% RDF + spent mushroom compost @ 2.73 t ha⁻¹, T₁₀-50% RDF + banana peel compost @ 2.55 t ha⁻¹, T₁₁-25% RDF + banana peel compost @ 3.83 t ha⁻¹. As per the recommended dose of fertilizer (N, P and K @ 100:40:60 kg ha⁻¹), 1/3 amount of urea, full of SSP and ½ of MOP was applied after the final bed preparation. While 2/3 of urea and ½ of MOP was applied in two equal splits where the first split was applied at 20 days after transplanting (DAT) and second split was applied at 35 days after transplanting (DAT). Well decomposed farm yard manure, used tea leaves, spent mushroom compost, bamboo groove top soil and banana peel compost, as per treatments were properly incorporated in the soil just prior to planting. All cultural operations were followed regularly during the crop growth. The entire experimental data for different vegetative, floral parameters and yield were statistically analyzed. The appropriate standard error of mean (SEm±) and the critical difference (C.D) were calculated at 5% level of probability.

3. Results and Discussion

3.1 Vegetative parameters

The data recorded in relevance to effect of integrated nutrient management practices on the vegetative growth of baby's breath cv. Star World during two seasons i.e. 2023-24 and 2024-25 as well as pooled data is presented in Table 1 and discussed below.

During all active growth stages, T₂(50% RDF + FYM @ 10 t ha⁻¹) resulted in superior performance in terms of vegetative attributes such as plant height at 30, 60, 90 and 120 days after transplanting (DAT), number of primary branches per plant and internodal length (cm).

Among the different treatments studied, pooled data (2023-24 and 2024-25) as presented in Table 1 with respect to plant height over two years significantly highlighted the influence of combination of different organic and inorganic fertilizers. T₂ (50% RDF + FYM @ 10 t ha⁻¹) recorded the maximum plant height with values of 20.83 cm, 29.86 cm, 48.33 cm and 83.96 cm at 30, 60, 90 and 120 DAT respectively. The results recorded were statistically at par with T₆ (50% RDF + used tea leaves @ 1.37 t ha⁻¹) followed by T₈ (50% RDF + spent mushroom compost @ 1.82 t ha⁻¹). Whereas, minimum plant height with measurements of

11.80 cm, 19.71 cm, 35.43 cm and 61.77 cm was recorded in control (T_0). This might be due to optimum availability of nutrients supplemented at optimal levels through farmyard manure with inorganic fertilizer. FYM acts as a slow-release source of nutrient and its application attributed to stimulatory action of adequate supply of essential nutrients in terms of cell division and cell enlargement required for plant luxuriant growth. Similar findings have also been reported by Kumar *et al.* (2020) ^[9] in chrysanthemum and Manigandan *et al.* (2024) ^[11] in marigold.

Similarly, data presented in Table 2 indicate significant influence in the consecutive seasons (2023-24 and 2024-25), including pooled data in T_2 (50% RDF + FYM @ 10 t ha⁻¹), which also exhibited the highest number of primary branches per plant increasing progressively to 8.12, 12.67 and 13.98 at 30, 60 and 90 DAT respectively. And the least number of primary branches per plant (2.95, 6.48 and 7.50) was recorded in control (T_0) at equivalent time intervals. Integration of nutrients from balanced dose of inorganic fertilizers and farmyard manure might have enhanced the soil organic matter, directly enabling the plant to take up available nutrients needed for photosynthetic activity. This biosynthetic action of carbohydrates and proteins elicited profuse lateral branches thereby, marking the increase in number of primary branches. These findings are in close conformity with Kumar *et al.* (2020) ^[9] in chrysanthemum and Manigandan *et al.* (2024) ^[11] in marigold. Additionally, data related to internodal length of the plant followed the same trend as presented in Table 2, where T_2 (50% RDF + FYM @ 10 t ha⁻¹) recorded 6.68 cm to give the longest internodal length which was at par with T_6 (50% RDF + used tea leaves @ 1.37 t ha⁻¹) recording 6.16 cm respectively. Release of growth promoting compounds through gradual decomposition of FYM may have hastened the growth of new tissues which encouraged the internodal elongation as opined by Geeta *et al.* (2010) ^[4] in chrysanthemum.

3.2 Flowering Parameters

The data related to flowering traits, as presented in Table 3, indicate that significant difference is recorded in application of balanced dose of inorganic fertilizers with organic manures in both the consecutive seasons (2023-24 and 2024-25) as well as pooled data. Days to first flower bud initiation (77.37 days), shortest duration to opening of florets (95.81 days) and earliness to 50% floret opening (107.62 days) was recorded in treatment T_2 (50% RDF + FYM @ 10 t ha⁻¹) signifying an accelerated transitioning of plant from vegetative to generative stage while proposing a potential improvement in reproductive efficiency and yield. These findings are in close proximity with Prasad *et al.* (2017) ^[13] in asiatic lily and Kumar *et al.* (2023) ^[10] in lilium.

3.3 Yield parameters

The yield parameters recorded in relevance to the study as presented in Table 4, are number of flowers per branch, number of flowers per plant and number of cut flower stem per plant. Experimentation carried out in consecutive seasons of 2023-24 and 2024-25 as well as pooled data revealed that number of flowers per branch (335.47), number of flowers per plant (3511.50) was recorded maximum in treatment T_2 (50% RDF + FYM @ 10 t ha⁻¹) which was at par with T_8 (50% RDF + spent mushroom compost @ 1.82 t ha⁻¹) and T_6 (50% RDF + used tea leaves @ 1.37 t ha⁻¹) showing significant influence through integrated application of chemical fertilizers and organic manures. Likewise, the same treatment T_2 (50% RDF + FYM @ 10 t ha⁻¹) significantly exhibited superiority in number of cut flower stem per plant (12.39). The results evidently showed that incorporation of balanced dose of chemical fertilizers with farmyard manure aided to better nutrient availability, enrich soil health effectively enhancing the plant vigor and yield. Similar results were also reported by Sahu *et al.* (2021) ^[15] in dahlia and Kumar *et al.* (2023) ^[10] in lilium.

Table 1: Effect of different INM packages on plant height (cm) of Baby's breath Cv. Star World.

Treatments	Plant height (cm)											
	30 DAT			60 DAT			90 DAT			120 DAT		
	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled
T_0	11.24	12.37	11.80	19.43	19.99	19.71	35.16	35.69	35.43	61.65	61.89	61.77
T_1	17.25	18.42	17.84	27.26	27.83	27.55	43.86	44.50	44.18	77.58	77.89	77.73
T_2	20.76	20.90	20.83	29.65	30.07	29.86	48.15	48.50	48.33	83.90	84.03	83.96
T_3	18.23	19.54	18.89	27.67	27.71	27.69	43.81	44.39	44.10	77.35	77.56	77.46
T_4	14.74	15.33	15.03	23.84	24.29	24.07	39.03	39.56	39.29	68.57	68.91	68.74
T_5	12.82	13.49	13.16	23.13	23.63	23.38	37.07	37.63	37.35	65.84	65.98	65.91
T_6	19.40	20.10	19.75	29.33	29.86	29.60	46.01	46.10	46.06	82.95	83.07	83.01
T_7	17.42	17.70	17.56	27.19	27.37	27.28	43.94	44.11	44.02	77.00	77.25	77.13
T_8	18.46	19.38	18.92	27.75	28.09	27.92	45.20	45.55	45.38	80.68	80.79	80.74
T_9	16.96	17.05	17.01	26.81	27.16	26.99	41.09	41.17	41.13	76.89	77.24	77.07
T_{10}	16.08	17.64	16.86	25.09	25.74	25.41	40.67	41.36	41.01	77.86	78.17	78.01
T_{11}	15.87	16.37	16.12	25.20	25.34	25.27	39.90	39.96	39.93	70.88	71.09	70.99
SEm±	0.88	0.96	0.65	0.80	0.83	0.58	1.45	1.46	1.03	1.89	1.91	1.34
CD at 5%	2.57	2.82	1.85	2.35	2.42	1.64	4.26	4.27	2.93	5.55	5.59	3.83

Table 2: Influence of different INM packages on number of primary branches at 30, 60, 90 DAT and internodal length (cm) of Baby's breath Cv. Star World

Treatments	Number of primary branches plant ⁻¹									Internodal length (cm)		
	30 DAT			60 DAT			90 DAT					
	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled
T ₀	2.80	3.10	2.95	6.27	6.70	6.48	7.30	7.70	7.50	4.16	4.27	4.21
T ₁	6.20	6.57	6.38	9.37	9.83	9.60	10.57	10.93	10.75	5.27	5.37	5.32
T ₂	7.93	8.30	8.12	12.10	13.23	12.67	13.73	14.23	13.98	6.51	6.84	6.68
T ₃	5.80	5.93	5.87	10.07	10.77	10.42	11.37	11.60	11.48	4.94	5.21	5.07
T ₄	3.47	4.67	4.07	8.33	8.77	8.55	9.33	9.83	9.58	4.59	4.95	4.77
T ₅	2.93	3.60	3.27	7.90	8.60	8.25	8.90	9.13	9.02	4.57	4.81	4.69
T ₆	6.07	6.87	6.47	10.37	10.53	10.45	11.47	11.67	11.57	5.93	6.33	6.13
T ₇	4.20	4.73	4.47	8.87	9.60	9.23	9.87	10.37	10.12	4.70	5.26	4.98
T ₈	6.57	6.87	6.72	10.53	11.27	10.90	12.27	12.80	12.53	5.15	5.68	5.41
T ₉	5.53	5.80	5.67	10.10	10.53	10.32	10.90	11.20	11.05	4.85	5.23	5.04
T ₁₀	4.47	4.67	4.57	9.20	9.57	9.38	9.93	10.40	10.17	5.13	5.50	5.32
T ₁₁	3.73	4.80	4.27	8.40	9.00	8.70	9.47	9.97	9.72	4.85	5.01	4.93
SEm±	0.68	0.65	0.47	0.57	0.68	0.44	0.49	0.49	0.35	0.37	0.40	0.27
CD at 5%	2.00	1.90	1.34	1.67	2.00	1.27	1.43	1.44	0.99	1.08	1.18	0.78

Table 3: Effect of different INM packages on flowering attributes of Baby's breath Cv. Star World.

Treatments	Days to flower bud initiation			Days to opening of florets			Days to 50% floret opening		
	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled
T ₀	86.93	86.80	86.87	103.20	103.03	103.12	114.23	114.10	114.17
T ₁	79.37	79.20	79.29	99.21	99.04	99.12	109.27	109.17	109.22
T ₂	77.50	77.23	77.37	96.02	95.59	95.81	107.70	107.53	107.62
T ₃	81.67	81.43	81.55	99.98	99.84	99.91	111.65	111.53	111.59
T ₄	80.73	80.23	80.48	99.49	99.08	99.29	110.93	110.87	110.90
T ₅	84.93	84.43	84.68	101.10	100.93	101.02	113.73	112.70	113.22
T ₆	78.77	78.48	78.62	97.98	97.80	97.89	108.75	108.66	108.71
T ₇	82.43	82.13	82.28	100.24	100.10	100.17	112.98	112.07	112.52
T ₈	78.53	78.33	78.43	96.84	96.63	96.74	108.18	108.10	108.14
T ₉	82.73	82.47	82.60	100.07	99.98	100.03	112.25	111.83	112.04
T ₁₀	78.40	78.07	78.24	97.96	97.63	97.80	109.16	109.03	109.10
T ₁₁	83.30	83.10	83.20	100.39	100.04	100.21	112.93	112.30	112.62
SEm±	0.69	0.66	0.48	0.40	0.39	0.28	0.96	0.95	0.68
CD at 5%	2.01	1.95	1.36	1.19	1.14	0.80	2.82	2.80	1.93

Table 4: Effect of different INM packages on yield attributes of Baby's breath Cv. Star World.

Treatments	Number of flowers branch ⁻¹			Number of flowers plant ⁻¹			Number of cut flower branch plant ⁻¹		
	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled	2023-24	2024-25	Pooled
T ₀	173.47	181.13	177.30	1792.27	1806.00	1799.13	7.30	7.60	7.45
T ₁	278.20	285.87	282.03	3187.50	3203.37	3195.43	9.88	10.33	10.11
T ₂	316.33	354.60	335.47	3502.27	3520.73	3511.50	12.38	12.40	12.39
T ₃	229.97	242.80	236.38	2869.73	2883.27	2876.50	10.10	10.27	10.18
T ₄	196.27	206.40	201.33	2427.97	2474.00	2450.98	9.18	9.60	9.39
T ₅	189.40	196.93	193.17	2098.77	2124.47	2111.62	7.92	8.27	8.09
T ₆	298.87	310.47	304.67	3225.77	3236.37	3231.07	10.52	10.73	10.63
T ₇	257.07	272.27	264.67	2665.47	2680.67	2673.07	9.90	10.00	9.95
T ₈	296.53	321.93	309.23	3347.33	3365.80	3356.57	11.23	11.53	11.38
T ₉	261.60	279.33	270.47	2775.90	2785.93	2780.92	10.12	10.13	10.13
T ₁₀	227.13	235.03	231.08	2587.57	2616.20	2601.88	9.42	9.87	9.64
T ₁₁	188.40	200.90	194.65	2245.23	2275.50	2260.37	8.23	8.53	8.38
SEm±	16.08	19.18	12.51	177.86	178.21	125.89	0.41	0.40	0.29
CD at 5%	47.15	56.26	35.67	521.64	522.67	358.80	1.21	1.18	0.82

References

- Bhavani S, Chandra Shaker K, Jayashree G, Padmaja B, Reddy GK. Effect of long-term application of inorganic and organic fertilizers on physical and physio-chemical properties of soil in rice cropping system. Bull Environ Pharmacol Life Sci. 2017;6(2):465-470.
- Charters ML. California plant names: Latin and Greek meanings and derivations. Calflora. 2015. Available from: <http://www.calflora.net/>
- Darwish OH, Persaud N, Martens DC. Effect of long-term application of animal manure on physical properties of three soils. Plant Soil. 1995;176(2):289-295.
- Geeta P, Kumar S, Kumar A. Effect of INM on growth and flowering of chrysanthemum (*Dendranthema grandiflora* Tzvelev). J Ornament Horticult. 2010;13(2):112-116.

5. Ghoshal N, Singh KP. Effect of farmyard manures and inorganic fertilizer on the dynamics of soil microbial biomass in a tropical dryland agroecosystem. *Biol Fertil Soils*. 1995;19:231-238.
6. Halevy AH. Advances in developing methods for the control of flowering of cut flower crops in mild winter climate—the Israeli experience. *Acta Hortic*. 2003;614:77-80.
7. Kristi. Banana peel fertilizer benefits and uses. 2018. Available from: <https://stonefamilyfarmstead.com/>
8. Kumar M, Chaudhary V. Effect of integrated sources of nutrients on growth, flowering, yield and soil quality of floricultural crops: A review. *Int J Curr Microbiol Appl Sci*. 2018;7(3):2373-2404.
9. Kumar M, Vishnupriya J, Subramaniyan P. Influence of organic manure and bio-fertilizers for growth and yield in chrysanthemum cv. Poornima White. *Int J Curr Res*. 2020;12(11):14929-14933.
10. Kumar N, Prasad VM, Bahadur V. Effect of organic and inorganic fertilizer on flowering, spike and bulb yield parameter of liliu (*Lilium longiflorum*) cv. Pavia under shade net condition. *J Community Mobil Sustain Dev*. 2023;18(2):407-414.
11. Manigandan E, Kumar S, Mailappa AS, Momin KC. Influence of organic and inorganic inputs on vegetative, flowering and yield attributes of marigold cv. Pusa Narangi Gaiinda. *Int J Plant Soil Sci*. 2024;36(5):266-273.
12. Mwangi RW, Mustafa M, Kappel N, Csambalik L, Szabo A. Practical applications of spent mushroom compost in cultivation and disease control of selected vegetable species. *J Mater Cycles Waste Manag*. 2024;26:1918-1933.
13. Prasad L, Saravanan S, Lall D, Singh VK. Effect of organic manure and inorganic fertilizer on plant growth and flower yield of Asiatic lily (*Lilium longiflorum*) sp. *Zephyranthes*. *Environ Ecol*. 2017;35(2A):929-932.
14. Ranjan R, Kumari A, Kumari M, Kumari N. Impact of leftover tea leaves on rate of flowering and soil fertility. *QUEST-Peer Rev Res J*. 2023;1(1).
15. Sahu D, Prasad VM, Fatm U. Effect of NPK on organic manures of flowering and flower yield of Dahlia (*Dahlia variabilis* L.) cv. Kenora Sunburst. *Int J Curr Microbiol Appl Sci*. 2021;10(3):643-650.
16. Sharma A, Sharma K, Gaur D, Dhakad H, Banafer RNS, *et al*. Effect of integrated nutrient management on growth, flower yield and vase life of marigold (cv. Pusa Narangi). *J Pharmacogn Phytochem*. 2017;6(6):319-323.
17. Wazir A, Gul Z, Hussain M. Comparative study of various organic fertilizers effect on growth and yield of two economically important crops, potato and pea. *Agric Sci*. 2018;9:703-717.
18. Yasin M, Gangan S, Panchal SK. Banana peels, a genuine waste or a wonderful opportunity? *Appl Sci*. 2025;15:3195.