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Effect of different organic and inorganic fertilizers on the enhancement of growth and yield of cucumber

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ABSTRACT

The present research aimed to investigate the impact of both organic and inorganic fertilizers on cucumber growth and yield. The experiment followed a randomized complete block design with three replications, involving seven treatment combinations: T1 (control), T2 (FYM), T3 (Vermicompost), T4 (NPK), T5 (NPK + 0.5% B), T6 (NPK + 0.5% Ca), and T7 (NPK + 0.5% Calbomin). The results revealed significant differences among the treatments. Treatment T2 (FYM) exhibited notable effects on various growth parameters, including the number of true leaves (35.91), leaf size (97.81 cm^2), number of flowers (4.12), and number of fruits (4.37). On the other hand, T3 (vermicompost) significantly influenced plant height (156.9 cm), fruit size (34.902 cm^2), and cucumber yield (17.53 Mt/ha). Conversely, the control group (T1) displayed the lowest response in terms of cucumber growth and yield parameters. Based on the findings, it is recommended that in inner Terai regions, such as Tulsipur, Dang in the Nepal, the application of the recommended dose of vermicompost be considered to achieve maximum yield, specifically in the range of 2-3 tons per hectare.

Keywords*:* Cucumber, *Cucumis sativus*, fertilizers, Calbomin, vermicompost

INTRODUCTION

Cucumber (*Cucumis sativus* L.) belongs to the *Cucurbitaceae* family (Kumar *et al.,* 2018). 'Cucurbit' was coined by Liberty Hyde Bailey to refer to cultivated species commonly known as the gourd family, which includes 117 genera and 825 species found in warmer regions worldwide (Singh *et al.,* 2017). It holds significance as a summer vegetable crop that thrives under specific growing conditions, typically requiring temperatures between 26 to 30 °C with plenty of sunlight (Saeed *et al.,* 2015), and is cultivated extensively across many countries globally. It is believed to have originated in India and Africa (Alhasnawi *et al*., 2020; Marliah *et al.,* 2020). Cucumbers are primarily cultivated for their fruits, which are consumed fresh in salads, cooked dishes, or pickled preparations. Nutrients play a crucial role in promoting crop growth and are vital for achieving maximum productivity. When there is an insufficient supply of these nutrients, it can lead to specific disorders in the plants, ultimately resulting in reduced yields and financial losses for the growers (Kumar *et al.,* 2018). Nitrogen assumes a primary role in the biochemical processes of plants. When nitrogen levels are low, it can lead to a reduction in the availability of other

essential mineral nutrients (Oke *et al.,* 2020). Cucumber cultivation typically relies on fertile soils. When grown in infertile soils, cucumbers tend to produce bitter and misshapen fruits, which are often rejected by consumers due to their undesirable taste and appearance (Eifediyi and Remison, 2010).

MATERIALS AND METHODS

The study was carried out in Dang, Nepal, situated at 82.2855° E longitude and 28.0069° N latitude, with an altitude of 603 meters above mean sea level. Dang is characterized by an inner terai (plain) topography and features a humid subtropical climate, with an average maximum temperature of 20°C and a minimum temperature of 10°C.
The study was conducted using the Meera cultivar of 'Korean F1' hybrid. There were a total of seven treatments, including one control group and six distinct nutrient media, as outlined in Table 1 below. The recommended fertilizer doses were as follows: FYM: 20 tons/ha, Vermicompost: 3 tons/ha, NPK: 120:60:50 kg/ha.

Table 1. Treatments applied

No	Treatments variant	
1	T1 -	Control
2	T2 -	FYM
3	T3 -	vermicompost
4	T4 -	NPK
5	T5 -	NPK + 0.5 % Boron
6	T6 -	NPK + 0.5 % Calcium
7	T7 -	NPK + 0.5 % Calbomin

The experiment used a Randomized Complete Block Design (RCBD) with three replications. Each replication included all seven treatments, which were randomized independently within each replication. Each plot measured 9.6m^2, with a plant-to-plant spacing of 0.60 meters and a row-to-row spacing of 1 meter. Data collection involved observing a total of 4 plants in each plot.
According to the treatments, full doses of FYM and vermicompost were applied to each planting area by digging pits measuring 25-20cm deep. NPK was applied following the recommended application guidelines, and micronutrients were applied using foliar application during the cropping season. To begin, a nutrient medium was prepared by combining FYM, vermicompost, and topsoil at a 1:1:1 ratio, and this mixture was tightly packed into poly bags. A single seed was sown in each poly bag. The seedlings were watered twice daily, and they were ready for transplantation 25 days after sowing. These 25-day-old seedlings were transplanted into the main field by digging pits that were 25-30 cm deep. Light irrigation was provided immediately after transplanting to ensure the seedlings' proper establishment, with subsequent irrigation occurring every 3-5 days due to the hot climate. Staking was performed using large bamboo poles and nylon rope to support the weight of cucumber vines and fruits. Cucumbers were harvested when they reached the desired size and market demand, and the harvest was weighed on a plot-by-plot basis.

Data collection

Sampling was conducted at 15-day intervals until the date of the final cucumber harvest. Four central plants were chosen from each treatment and replication for the study.

Growth and yield Parameters

The number of leaves, height, and number of nodes of the sampled plants were recorded at various time points after transplantation, specifically at 15 days, 30 days, 45 days, 60 days, and 75 days. For the leaves, we calculated the average count after measuring the number of leaves on each plant. For the height, we measured the distance from the base just above the

soil surface to the top of the plants at each time point. To determine leaf size, we randomly selected five leaves from each sampled plant and measured their length and width, ensuring a representative sample from each plant. Finally, for the number of nodes, we counted and calculated the average value at the same time points after transplantation.

Flower initiation was monitored in each plot, and the number of flowers on sampled plants was documented at 30 days, 45 days, 60 days, and 75 days after transplantation. Additionally, we recorded the number of fruits on sampled plants at the same time points, i.e., 30 days, 45 days, 60 days, and 75 days after transplantation. To assess fruit dimensions, we employed a measuring scale to measure the length of the fruits and used a Vernier Caliper to measure the diameter (in centimetres). A minimum of five fruits from each sampled plant were measured to calculate their size. These measurements were taken at the same intervals: 30 days, 45 days, 60 days, and 75 days after transplantation. The fruits that met marketable size criteria were harvested at regular intervals using scissors. The yield weight of fruits from different plots was measured individually to maintain a comprehensive record of the yield. Throughout the research period, there were a total of 8 harvests.

The data we obtained was inputted using MS Excel (2019). We then analysed the gathered data using Gen-stat (18th edition). To compare the average values of each set of data, we employed DMRT, as described by Gomez and Gomez (1984).

RESULTS AND DISCUSSIONS

The data regarding the number of true leaves showed high significance, indicating that the treatment had a highly significant effect on the number of leaves per plant. Among the different treatments, T6 (Normal NPK + 0.5% Calcium) exhibited the highest number of leaves at 15 days, with 11.58 leaves per plant, followed by T3, T2, T4, T7, T5, and T1, respectively. However, at 30 days, T3 had the highest number of leaves, with 36.27 leaves per plant, followed by T2, T4, T1, T6, T7, and T5, respectively. Similarly, T2, which received the recommended dose of FYM, demonstrated a higher number of leaves at 45, 60, and 75 days, with values of 44.02, 55.18, and 50.21 leaves per plant, respectively. This was followed by T3, T1, T4, T6, T7, and T5 in each respective time period. In contrast, treatment T5 (Normal dose of NPK + 0.5% boron) exhibited lower numbers of leaves at 45, 60, and 75 days, with values of 22.68, 27.83, and 25.76 leaves per plant (Table 2). The notable impact of farmyard manure (FYM) on leaf count corresponds with the findings of Orluchukwu and Amadi (2022), who observed that the timely utilization of nutrients fosters enhanced growth and leaf proliferation.

Plant height was measured at 15, 30, 45, 60, and 75 days after transplantation (DAT), respectively. The data of plant height were found to be significant. In general, there was a consistent increase in plant height from the time of transplantation to the final harvest. A summary of the data is presented in Table 3 below. Cucumber vine height exhibited a highly significant increase with the application of T3 (dose of vermicompost) after 75 DAT, reaching the tallest height of 156.9 cm followed by T4, T2, T5, T6 and T1 with respective heights of 152.60 cm, 136.3 cm, 121.4 cm, 116.2 cm, and 115.4 cm, while the lowest height was observed with T7 (NPK dose + 0.5% calbomin) at 96.50 cm. The observed increase in plant height can be attributed to the incorporation of the recommended amount of vermicompost, a phenomenon supported by various studies (Law-Ogbomo and Osaigbovo, 2018)

The leaf area index, or leaf size of cucumber, was measured at 15, 30, 45, 60, and 75 days after transplantation (DAT), respectively. A review of the data is presented in Table 4. The data concerning the leaf area index exhibited significance primarily during the initial phases of plant growth, namely at 15 and 30 DAT. At 15 days, T1 (control) displayed the highest value, measuring 41.11 cm^2, while the lowest value was observed with T7 (NPK

dose + 0.5% Calbomin) at 14.5 cm^2. Among the various treatments, T2 (dose of FYM) recorded the largest leaf area at 30 DAT, measuring 135.9 cm^2, while the smallest leaf area was observed with T1 (control) at 88.4 cm^2. However, the leaf area was found to be non-significant at 45, 60, and 75 DAT. Among the different treatments, T2 (dose of FYM) consistently recorded the highest leaf area, measuring 135.1 cm^2, 144.2 cm^2, and 136 cm^2 at 45, 60, and 75 DAT, respectively. T4 (NPK dose) had the smallest leaf area, measuring 103 cm^2 at 45 DAT, while T7 (NPK dose + 0.5% Calbomin) had the lowest value of 118.2 cm^2 at 60 DAT, and T4 (NPK dose) had the lowest value of 125 cm^2 at 75 DAT. The lack of statistically significant findings concerning leaf size could be linked to the genetic makeup of the cucumber seeds, as proposed by Ikeh *et al.* (2012).

Table 2. Response of organic and inorganic fertilizers on growth of true leaves of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Number of true leaves				
	15 DAT	30 DAT	45 DAT	60 DAT	75 DAT
Control	5.833^{b}	20.45^{bc}	30.17^{bc}	35.73^{bc}	33.22^{bc}
Recommended dose of FYM	7.08^{b}	23.08^{b}	44.02^{a}	55.18^{a}	50.21^{a}
Recommended dose of vermicompost	10.25^{a}	36.27^{a}	34.99^{b}	38.59^{b}	36.14^{b}
Normal NPK dose	6.90^{b}	22.00^{bc}	27.93^{bc}	32.28^{bc}	29.77^{bc}
Normal NPK dose + 0.5 % Boron	6.40^{b}	15.58^{c}	22.68^{c}	27.83^{c}	25.76^{c}
Normal NPK dose + 0.5 % Calcium	11.58^{a}	17.18^{bc}	27.33^{bc}	31.64^{bc}	28.81^{bc}
Normal NPK dose + 0.5 % Calbomin	6.67^{b}	17.10^{bc}	28.66^{bc}	28.20^{c}	27.70^{bc}
CV %	*22.3*	*17.7*	*14.4*	*14.7*	*15.4*
LSD	*2.99*	*6.70*	*7.75*	*9.15*	*8.93*
F-test	**	**	**	**	**

*CV: Coefficient of variation; LSD: Least significant difference; **Significant at 1% level of significance; Means within a column that share the same letter are not significantly different at the 5% level.*

Table 3. Response of organic and inorganic fertilizers on the height of vines of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Plant height				
	15 DAT	30 DAT	45 DAT	60 DAT	75 DAT
Control	23.03^{b}	42.88^{bc}	56.38^{e}	100.0^{de}	115.40^{bc}
Dose of FYM	24.10^{b}	66.29^{a}	94.10^{ab}	127.9^{bc}	136.30^{ab}
Dose of vermicompost	20.55^{ab}	49.58^{b}	97.09^{a}	150.0^{a}	156.90^{a}
NPK dose	14.89^{a}	41.84^{bc}	81.58^{bc}	140.3^{ab}	152.60^{a}
NPK dose + 0.5 % Boron	17.10^{ab}	42.81^{bc}	77.84^{cd}	113.9^{cd}	121.40^{b}
NPK dose + 0.5 % Calcium	20.07^{ab}	48..02^{b}	64.51^{de}	97.7^{de}	116.20^{bc}
NPK dose + 0.5 % Calbomin	15.42^{a}	33.83^{c}	62.97^{e}	90.8^{e}	96.50^{c}
CV %	*19.8*	*11.6*	*10.20*	*9.60*	*10.20*
LSD	*6.67*	*9.38*	*13.62*	*19.62*	*22.79*
F-test	*NS*	**	**	**	**

*CV: Coefficient of variation; LSD: Least significant difference; **Significant at 1% level of significance, ^{NS}Non-significant; Means within a column that share the same letter are not significantly different at the 5% level*.

Among the various treatments, T2 (dose of FYM) recorded the maximum number of nodes, measuring 5.83, 42.25, and 45.56 at 15, 60, and 75 DAT, respectively. Conversely, T4 (NPK dose) had the highest number of nodes at 30 DAT, with a value of 14.28, while T3 (dose of vermicompost) exhibited the highest number of nodes at 45 DAT, with a value of 24.92. On

the other hand, T4 (NPK dose) displayed the lowest number of nodes at 15 DAT, measuring 3.54, while T5 (NPK dose + 0.5% Boron) had the lowest number of nodes at 30 DAT, with a value of 9.00, T6 (NPK + 0.5% Calcium) recorded the lowest number of nodes at 45 DAT, 60 DAT, and 75 DAT, with values of 14.18, 17.58, and 21.20, respectively (Table 5). The significant findings illustrating the impact of different treatments on the number of nodes in cucumber plants are consistent with the observations made by Oke *et al.* (2020). According to their research, the increased absorption of nitrogen and nitrates within the root zones, facilitated by the application of farmyard manure (FYM), had a substantial influence on the growth of nodes in the plants.

Table 4. Response of organic and inorganic fertilizers on the size of the leaves of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Size of leaves				
	15 DAT	30 DAT	45 DAT	60 DAT	75 DAT
Control	41.11^{a}	88.4^{b}	96.7^{b}	109.6^{b}	111.0^{a}
Dose of FYM	37.88^{ab}	135.9^{a}	135.1^{a}	144.2^{a}	136.0^{a}
Dose of vermicompost	35.73^{ab}	92.5^{b}	112.4^{ab}	121.0^{ab}	119.4^{a}
NPK dose	17.10^{c}	99.0^{b}	103.0^{b}	119.8^{ab}	112.5^{a}
NPK dose + 0.5 % Boron	29.90^{b}	95.7^{b}	115.4^{ab}	130.2^{ab}	121.1^{a}
NPK dose + 0.5 % Calcium	31.12^{ab}	101.9^{b}	114.2^{ab}	128.2^{ab}	118.4^{a}
NPK dose + 0.5 % Calbomin	14.50^{c}	88.4^{b}	117.5^{ab}	118.2^{ab}	113.6^{a}
CV %	*18.5*	*10.9*	*12.3*	*12.0*	*12.10*
LSD	*9.60*	*19.62*	*24.37*	*26.12*	*25.20*
F-test	**	**	*NS*	*NS*	*NS*

*CV: Coefficient of variation; LSD: Least significant difference; **Significant at 1% level of significance, ^{NS}Non-significant; Means within a column that share the same letter are not significantly different at the 5% level.*

The number of flowers on cucumber plants was recorded at 30, 45, 60, and 75 days after transplantation (DAT), as presented in Table 6. The data concerning the number of flowers exhibited significant differences, indicating that the use of different treatments had varying effects on cucumber flowering. Among the different treatments, T6 (NPK + 0.5% Calcium) recorded the maximum number of flowers, with 4.75 at 30 DAT. Dose of FYM T2 (T2) recorded the highest number of flowers, with 7.5 and 7.92 at 45 and 60 DAT, respectively.

Dose of FYM (T2) recorded the highest number of flowers, with 7.5 and 7.92 at 45 and 60 DAT, respectively. Dose of vermicompost (T3) had the highest number of flowers, with 3.93 at 75 DAT. Conversely, among the different treatments, T1 (control) had the lowest number of flowers, with 1.92 at 30 DAT. T6 (NPK + 0.5% Calcium) had the lowest number of flowers, with 2.33 at 45 DAT. T7 (NPK dose + 0.5% Calbomin) exhibited the lowest number of flowers, with 1.66 at 60 DAT, and T6 (NPK + 0.5% Calcium) had the lowest number of flowers, with 1.91 at 75 DAT. Among the various treatments, both FYM and Vermicompost exhibited a more favorable response in stimulating cucumber flowering, in line with the conclusions drawn by Marliah *et al.* (2020). Their research further elucidated that organic materials typically have positive effects on the flowering process.

The data pertaining to the number of fruits exhibited significant differences, indicating that the use of different treatments had varying effects on cucumber fruiting. Among the different treatments, T3 (dose of vermicompost) recorded the highest number of fruits per plant, with 4, 4.16, 4.13, and 2.91 at 30, 45, 60, and 75 days, respectively, as presented in

Table 7. Conversely, T5 (NPK dose + 0.5% Boron) had the lowest number of fruits, with 1.22 at 30 days while T1 (control) exhibited the lowest number of fruits per plant, with 2.58 at 45 DAT. T5 (NPK dose + 0.5% Boron) also had the lowest number of fruits per plant, with 1.41 and 1.33 at 60 and 75 DAT, respectively. The conversion rate from flowers to fruits was relatively low, possibly owing to various challenges encountered during the research, including factors such as rainfall and high-speed wind flow, as noted by Singh *et al.* (2017). Nevertheless, when it comes to vermicompost, more favorable outcomes were observed due to the enhanced establishment of the plant base, as substantiated by other parameters in the study (Singh *et al.,* 2017).

Table 5. Response of organic and inorganic fertilizers on number of nodes of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Number of nodes				
	15 DAT	30 DAT	45 DAT	60 DAT	75 DAT
Control	5.33^{a}	10.25^{ab}	14.68^{a}	21.75^{d}	24.37^{bc}
Dose of FYM	5.83^{a}	13.08^{a}	23.33^{a}	42.25^{a}	45.56^{a}
Dose of vermicompost	5.17^{a}	10.67^{ab}	24.92^{a}	37.59^{ab}	38.29^{ab}
NPK dose	3.54^{a}	14.28^{a}	19.10^{a}	24.50^{cd}	23.31^{bc}
NPK dose + 0.5 % Boron	3.66^{a}	9.00^{ab}	21.01^{a}	37.75^{abc}	35.28^{abc}
NPK dose + 0.5 % Calcium	5.25^{a}	9.44^{ab}	14.18^{a}	17.58^{d}	21.20^{c}
NPK dose + 0.5 % Calbomin	3.75^{a}	7.17^{b}	18.29^{a}	28.90^{bcd}	25.41^{bc}
CV %	*30.9*	*28.7*	*34.4*	*22.3*	*25.9*
LSD	*2.521*	*5.307*	*11.674*	*11.605*	*13.855*
F-test	*NS*	*NS*	*NS*	*	*

*CV: Coefficient of variation; LSD: Least significant difference; *Significant at 5% level of significance, ^{NS}Non-significant; Means within a column that share the same letter are not significantly different at the 5% level*.

Table 6. Response of organic and inorganic fertilizers on flowering of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Number of flowers (days)			
	30 DAT	45 DAT	60 DAT	75 DAT
Control	1.92^{b}	4.67^{ab}	3.42^{b}	2.35^{ab}
Dose of FYM	2.25^{b}	7.50^{a}	7.92^{a}	3.17^{ab}
Dose of vermicompost	4.50^{a}	6.33^{a}	3.87^{b}	3.93^{a}
NPK dose	4.00^{ab}	3.33^{b}	4.03^{b}	2.75^{ab}
NPK dose + 0.5 % Boron	2.42^{b}	2.83^{b}	3.66^{b}	2.00^{bc}
NPK dose + 0.5 % Calcium	4.75^{a}	2.33^{b}	3.41^{b}	1.91^{bc}
NPK dose + 0.5 % Calbomin	4.58^{a}	2.75^{b}	1.66^{b}	0.58^{c}
CV %	*31.8*	*37.40*	*40.6*	*37.70*
LSD	*1.94*	*2.78*	*2.84*	*1.57*
F-test	*	**	*	*

*CV: Coefficient of variation; LSD: Least significant difference; *Significant at 5% level of significance, **Significant at 1% level of significance; Means within a column that share the same letter are not significantly different at the 5% level*.

The size of fruits on cucumber plants was measured at 30, 45, 60, and 75 days after transplantation (DAT), respectively (Table 8). The data collected regarding the size of fruits showed significant differences, indicating that the use of different treatments had varying effects on the size of cucumber fruits. Among the different treatments, T3 recorded the largest size of fruits, measuring 34.48 cm^2, 45.09 cm^2, 50.09 cm^2, and 43.72 cm^2 at 30, 45, 60, and 75 DAT, respectively, as presented in Table 9. Conversely, T4 (l NPK

dose) had the smallest size of fruits, measuring 15.30 cm^2 at 30 DAT, while T7 (NPK dose + 0.5% Calbomin) exhibited the smallest size of fruits, measuring 29.17 cm^2 at 45 DAT. T6 (NPK dose + 0.5% Calcium) had the smallest size of fruits, measuring 28.77 cm^2 and 25.71 cm^2 at 60 and 75 DAT, respectively.

Table 7. Response of organic and inorganic fertilizers on fruiting of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Number of fruits			
	30 DAT	45 DAT	60 DAT	75 DAT
Control	1.50^{c}	2.58^{c}	3.00^{ab}	2.10^{ab}
Recommended dose of FYM	2. 83^{ab}	3.66^{abc}	3.10^{ab}	2.16^{ab}
Recommended dose of vermicompost	4.00^{a}	4.16^{ab}	4.13^{a}	2.91^{a}
Normal NPK dose	1.83^{bc}	3.05^{bc}	1.51^{cd}	1.82^{b}
Normal NPK dose + 0.5 % Boron	1.22^{c}	3.05^{bc}	1.41^{d}	1.33^{b}
Normal NPK dose + 0.5 % Calcium	3.08^{b}	4.21^{ab}	2.85^{abc}	2.18^{ab}
Normal NPK dose + 0.5 % Calbomin	1.41^{c}	4.91^{a}	2.69^{bcd}	1.88^{ab}
CV %	*29.70*	*22.10*	*27.30*	*26.70*
LSD	*1.19*	*1.42*	*2.84*	*0.96*
F-test	**	*	**	*

*CV: Coefficient of variation; LSD: Least significant difference; *Significant at 5% level of significance, **Significant at 1% level of significance; Means within a column that share the same letter are not significantly different at the 5% level.*

Table 8. Response of organic and inorganic fertilizers on size of fruits of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Size of fruits			
	30 DAT	45 DAT	60 DAT	75 DAT
Control	22.70^{bc}	29.22^{b}	35.73^{bc}	38.17^{ab}
Dose of FYM	16.98^{c}	31.09^{b}	41.60^{ab}	33.99^{abc}
Dose of vermicompost	34.48^{a}	45.09^{a}	50.09^{a}	43.72^{a}
NPK dose	15.30^{c}	28.14^{b}	39.16^{abc}	34.32^{abc}
NPK dose + 0.5 % Boron	29.94^{ab}	30.50^{b}	37.47^{bc}	28.24^{bc}
NPK dose + 0.5 % Calcium	34.11^{a}	30.78^{b}	28.77^{c}	25.71^{c}
NPK dose + 0.5 % Calbomin	21.91^{bc}	29.17^{b}	41.56^{ab}	41.56^{ab}
CV %	21.5	18.7	15	17.9
LSD	9.42	10.48	10.29	10.63
F-test	**	*	*	*

*CV: Coefficient of variation; LSD: Least significant difference; *Significant at 5% level of significance, **Significant at 1% level of significance; Means within a column that share the same letter are not significantly different at the 5% level.*

This observation concurs with the findings of Nwofia *et al.* (2015), underscoring the growth-enhancing attributes of bioactive constituents present in vermicompost. The yield of cucumber was measured after harvesting the matured fruit. The highest yield, at 17.53 metric tons per hectare (Mt/ha), was achieved with the application of vermicompost, while the lowest yield was observed under control conditions, at 6.09 Mt/ha, as presented in Table 9. Similar results when applying vermicompost were reported by Kumar et al. (2018), Alhasnawi et al., (2020)

Table 9. Response of organic and inorganic fertilizers on yield of cucumber (*Cucumis sativus*) at Tulsipur, Dang, Nepal, 2022

Treatments	Yield per ha
Control	6.09[d]
Recommended dose of FYM	14.00[b]
Recommended dose of vermicompost	17.53[a]
Normal NPK dose	7.72[d]
Normal NPK dose + 0.5 % Boron	11.35[c]
Normal NPK dose + 0.5 % Calcium	8.66[d]
Normal NPK dose + 0.5 % Calbomin	7.28[d]
CV %	*14.1*
LSD	*2.56*
F-test	***

*CV: Coefficient of variation; LSD: Least significant difference; **Significant at 1% level of significance; Means within a column that share the same letter are not significantly different at the 5% level.*

CONCLUSIONS

Based on the findings of the present study, it is concluded that cucumber yield has exhibited a remarkable response to the application of T3 (dose of vermicompost), yielding values of exceedingly high significance. The highest recorded yield reached a staggering 17.53 metric tons per hectare, while the lowest yield was observed in the control condition, registering at 6.09 metric tons per hectare. Likewise, the application of T2 (dose of FYM) has demonstrated a substantial response in terms of growth parameters.

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