Effect of plant geometry, graded fertility and zinc level on growth characters, yield and quality of baby corn (Zea mays L.) fodder in Bihar

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Abstract
A Field experiment was conducted on sandy loam soil at Sabour during kharif season of 2018 to evaluate optimum plant geometry, graded fertility level and zinc level for better growth, yield and quality of baby corn (Zea mays L.) fodder. Experiment was laid out in split–plot design and replicated thrice with three plant geometry viz. P₁ (40X20 cm), P₂ (50X15 cm) and P₃ (paired row at 50+30 x 20 cm) in main plot, three levels of graded fertility (kg ha⁻¹) viz. F₁(120:60:60), F₂ (150:75:75) and F₃ (180:90:90) in sub plot wherease, two levels of zinc (kg zinc ha⁻¹) viz Z₁ (2.5) and Z₂ (5.0) in sub-sub plot. It may be concluded that better growth parameters, baby corn yield (14.34q ha⁻¹), green fodder yield (267.82q ha⁻¹) and quality parameters of green fodder recorded with paired row plant geometry. The growth parameters, baby corn yield (13.92q ha⁻¹), green fodder yield (278.891q ha⁻¹) and quality parameters of green fodder was improved with higher fertility level 180:90:90 kg N: P₃:K₃O ha⁻¹. Higher level of zinc had improved growth parameters, baby corn yield (13.38q ha⁻¹), green fodder yield (277.74q ha⁻¹) and quality parameters of green fodder with successive increase in zinc level up to maximum level of fertility Zn₂ (5.0 kg ha⁻¹).

Keywords: Plant geometry, fertility, Zinc, growth, yield, baby corn fodder, quality parameter

1. Introduction
Maize (Zea mays L.) is grown on an area of 9.5 m ha, with production and productivity of 25.0 mt and 26.3 q ha⁻¹, respectively (Anon. 2018) in India. Maize assumes a special significance in Indian agriculture on account of its utilization as food, feed, fodder, silage and specialty corn besides several industrial uses. The crispy nature of baby corn and its high nutritional value has made it of special choice among the elite group of people (Das et al., 2009). Its consumption is considered ecofriendly because it is free from the residue of pesticides by virtue of natural protection through many layers of husk. After harvesting of baby corn, quality palatable green fodder is used for cattle feed and for making good quality silage. At present, the scarcity of green fodder, dry fodder and concentrate feed are about 35.6 per cent, 40.8 per cent and 44 per cent respectively across the country. The demand of dry and green fodder will reach to 631 and 1012 million tonnes of by the year 2050. The estimated data shows that there will be deficit in dry (13.2 per cent) and green fodder (18.4 per cent) in the year 2050. Annually about 1.69 per cent forage has to grow for fulfillment of the deficit forage per cent. To meet the requirement of current situation there is need to increase the production as well as productivity of fodder. Quantity as well as quality is also a major concern with respect to fodder production. Forage quality can be defined as the extent to which forage has the potential to produce a desired animal response such as palatability, digestibility, and nutrient content and animal response. After plucking of baby corn, its fodder is considered ideal forage because it grows quickly, produces high yields, is palatable, is rich in nutrients, and helps to increase body weight and milk quality in cattle. As fodder for livestock, maize fodder is excellent, highly nutritious and sustainable, Iqbal et al. 2006 [1]. Its quality is much better than sorghum and pearl millet, since both sorghum as well as pearl millet possess anti-quality components such as hydrocyanic acid and oxalate, respectively. Hence after plucking of baby cob, it may be consider as fodder maize, and explore the possibilities of generating more income and employment for farming community of the region especially in periurban areas.
There is good opportunity of baby corn production in rainfed region of South Bihar. The Diara region of Bihar is generally flooded after second week of August every year, which may be utilized for kharif baby corn where short duration baby corn may be harvest before flood occurrence. Maize for baby corn cum green fodder may be grown as a best substitution of grain maize to get better economic returns because it is harvested in short time (within 65-75 days) which provides sweet, succulent and delicious green cobs and 3-4 crops of baby corn with good quality palatable green fodder can be taken through staggered planting in a year. Crop geometry vary widely in different parts of the world because great abundance of maize strains and their distribution all over the globe in different climatic conditions. Crop geometry is one of the important factors for higher production as it determines the optimum plant population of a crop. Baby corn crop is heavy feeder of nutrients which productivity is largely dependent on nutrient management. Their application may assist in obtaining maximum production of baby corn, but the excessive use of chemical fertilizers has been associated with decline in soil physical and chemical properties and crop yield (Kumar et al., 2016) [9]. Zinc fertilization are used to increase micronutrient in edible parts to reduce the micro nutrient deficiency and help for quality fodder production. For quality improvement of edible parts of crop, for enhancement of yield and zinc concentration in plants, Zn is extensively used.

2. Material and Methods
A experiment was carried out at Research farm, Bihar Agricultural University, Sabour during kharif season of 2018 under rainfed condition. The farm is situated at 25°50'S latitude, 87°19'E longitude and at an altitude of 52.73 m above mean sea level. The sandy-loam soil of the experimental field was low in organic carbon (0.50%) and available N (182.3 kg ha⁻¹), medium in available P (37.7 kg ha⁻¹) and K (190.7 kg ha⁻¹) with pH 7.5. The experiment was laid out in split-plot design with three level of plant geometry viz. P₁ (40X20 cm), P₂ (50X15 cm) and P₃ ( paired row at 50+30 x20 cm) in main plot, three levels of fertility (kg NPK/ha) viz. F₁(120:60:60), F₂ (150:75:75) and F₃ (180:90:90) in sub plot whereas, two levels of zinc (kg/ha) viz, Z₁ (2.5) and Z₂ (5.0) in sub-sub plot and replicated thrice. Crop was sown on 2nd June 2018 on levelled soil by opening 5 cm deep furrow at as per spacing of treatments. The different doses of graded fertilizers were applied as per the treatments. Full amount of phosphate and potassic fertilizer, zinc and half amount of nitrogenous fertilizer were applied as uniformly as possible before sowing. The rest half of the nitrogenous fertilizer was applied as top dressing during the time of earthing up and detasseling stage. The field was kept free from weeds. Harvesting of baby corn was done at 2-3 days of silk emergence stage by leaving border rows. The growth parameters were recorded at15, 30, 45 DAS, and at harvest as per treatment. Harvesting of baby corn was done at 2-3 days of silk emergence stage by leaving border rows. These baby cobs were counted weighted and thereafter husked and silk was removed and baby corn yield was recorded. After plucking of 100% baby cob, the baby corn plant was harvested and weighted from 1st and 2nd August 2018 as per treatments. Total rain fall received during crop period was 370 mm with 17 rainy days. 

Chemical analysis: Baby corn plant sample were collected treatment wise at the time of plant harvesting, then dried after that grinded and followed the standard procedure for the chemical analysis.

i) Nitrogen and protein content (%): Nitrogen content in the corn plant was estimated by Kjeldahl method and multiplied by 5.95 (Lu and Luh, 1991) to get crude protein content. 

ii) Phosphorus content (%): Phosphorus was estimated by Vandomolybdo-phosphoric acid yellow colour method using the Barton’s reagent as suggested by (Jackson, 1973). 

iii) Potassium content (%): The potassium was determined with the help of flame photometer. 

iv) Zinc content (%): The zinc content was determined via atomic absorption spectrophotometer. 

v) Statistical analysis
The data on various observations were statistically analyzed by the procedure of analysis of variance for split-plot design (SPD) given by Panse and Sukhatma (1985) [13]. For significant ‘F’ test, critical difference (CD) was reported at 5 per cent probability level.

3. Results and Discussion

3.1 Effect of Plant geometry, fertility and zinc on growth characters of baby corn fodder
It is obvious from the data (Table 1) that growth characters viz, plant height, leaf area index, dry matter accumulation and SPAD value increased as growth progressed from 15 DAS to harvest irrespective of experimental variables. The different plant geometry has been found to exert a significant difference on crop growth stages in terms of plant height, leaf area index, dry matter accumulation and SPAD value index except during initial stage of growth. The data regarding plant height and LAI at different growth stages as well as at harvest found that dense planting at 50cm x 15 cm spacing had significantly taller plant and higher LAI which at par to paired row planting. The higher plant height in closer spacing might be attributed to increase in competition for sunlight, nutrients, space and water by the plants which coupled with favourable climatic conditions. The results are in conformity with the findings of Kunjir et al., (2007) [9] who also recorded higher plant height with closer spacing as compared over wider spacing. Higher leaf area index in closer spacing was observed due to increased plant density which accommodates more number of plants and can also be ascribed to lesser value of spacing (Wasnik et al., 2012) [23]. The crop sown under P₃ (paired row at 50+30 x20 cm) resulted significant values of SPAD and dry matter accumulation (g plant⁻¹). This might be due to the fact that lesser competition between the plants under paired row spacing which might have provided sufficient space to the crop for harnessing the solar energy and effective utilization of nutrients and moisture.

As regards to fertility level, F₃ (180:90:90 kgN:Pₒ₂:Kₒ ha⁻¹) recorded significantly higher values of growth characters (plant height and SPAD) but remained at par to preceding fertility level F₂ (150:75:75 kgN:Pₒ₂:Kₒ ha⁻¹) at almost all the growth stages. Dry matter accumulation (g plant⁻¹) and leaf area index recorded significantly higher values with application of F₃ (180:90:90 kgN:Pₒ₂:Kₒ ha⁻¹) at almost all the growth stages. This might be due to the more availability of nutrients in soil. These results are in line with Khadtare et al., (2006) and Dadarwal et al., (2009) [13]. Irrespective of variation in the level of fertility, balance application of N, P and K enables the crop to produce taller plants and more number of active leaves which ultimately caused more dry matter accumulation. The dry matter accumulation was
initially slow because of slow growth during early stages (lag phase) primarily due to lower assimilating surface which rendered lower rate of photosynthesis and consequently less dry matter production during the initial stage of crop growth. Results obtained Sahoo and Mahapatra (2007), Singh and Choudhary (2008)[19]. It is obvious from data that zinc supply caused significant effect on growth characters (plant height, SPAD, LAI, dry matter accumulation). Application of 5.0 kg Zn ha⁻¹ noticed tallest plant, significant values of SPAD, LAI and dry matter accumulation at various growth stages and at harvest. As Zinc fertilization has beneficial effect on physiological process, plant metabolism and plant growth. Similar observation was noticed by Kumar and Bohra (2014) [6] with application of zinc in maize. Application of Z₂ (5 kg Zn ha⁻¹) exerted significant increase in LAI and dry matter accumulation over Z₁ (2.5 kg ha⁻¹) this happened due to zinc application which takes part in metabolism of plant as an activator of several enzymes and in turn may directly or indirectly affect the synthesis of carbohydrate and protein. These results are in conformity with the results Arya and Singh (2000). Nitrogen and zinc also helps in manufacturing more leaf area as a consequence more assimilates production. Similarly more vegetative development by nitrogen resulted in increased mutual shading and internodal expansion was also reported by Asif et al. (2013) [2].

3.2 Effect of Plant geometry, fertility and zinc on Cob formation (days to cob harvest)
Data recorded on days to 50 %, 75 % and 100 % of cob harvest was affected by plant geometry, fertility and zinc levels are presented in Table 3.
The P₁ (paired row) of plant geometry showed significantly lower number of days to 75 % of cob harvest. However, there was no significant result of plant geometry was observed at the time of 50 % and 100 % of cob harvest. This might be due to the fact that lesser competition between the plants under paired row spacing which might have provided sufficient space to the crop for harnessing the solar energy and effective utilization of nutrients and moisture which resulted early emergence of cob.
Fertility levels exhibited significant influence on days to 100 % of harvest of baby cobs. The treatment F₁ (180:90:90 kg N:P₂O₅:K₂O ha⁻¹) bears early cob at different cob emergence phases followed by F₂ (150:75:75 kgN:P₂O₅:K₂O ha⁻¹) and F₃ (120:60:60 kg N:P₂O₅:K₂O ha⁻¹), F₃ fertility level reduced span of day to harvest over preceding level of fertility at 50 % and 75 % cob emergence and F₂ (150:75-75) at 50 % and 75 % cob plucking stage, but Increased number of day to 100% cob harvest. Increasing fertility level reduced the span of time to the harvestable stage of baby cobs on 50 % cob harvest and due to better nutrition second cob initiation took place which influenced more number of days to 100% cob harvest. This might be due to the more availability of nutrients in soil and luxury consumption by plants.
Zinc application with 5.0 kg ha⁻¹ had increase the number of days to cob harvest at 75 % and 100 % cob plucking stage. This was might be the facts that zinc fertilization has beneficial effect on physiological process, plant metabolism and plant growth.

3.3 Effect of plant geometry, fertility and zinc on quality of baby corn and green fodder
Significantly higher baby corn yield (14.34 q ha⁻¹) were recorded with paired row planting. The crop under the wider inter row spacing has utilized the available resources more efficiently and hence, producing more yield attributes helped to higher baby corn yield. The crop under closer geometry at 50 cm x 15 cm of plant geometry exhibited highest green fodder yield (284.24 q ha⁻¹) as compared to the wider geometry. The fodder yield might have compensated these because of more number of plants ha⁻¹. The result is similar to the findings of Mathukia et al. (2014) [11] and Singh et al. (2015) [10].
Fertility had significant improved baby corn yield (13.92 q ha⁻¹) and green fodder yield (278.91q ha⁻¹) with application of F₂ (180:90:90 kgN:P₂O₅:K₂O ha⁻¹) however, bay corn yield was at par preceding level of fertility F₁ (150:75:75 kgN:P₂O₅:K₂O ha⁻¹).
Fertility had improved yield attributes and green fodder yield with successive increase in fertility level up to maximum level of fertility F₃ (180-90-90). That might be due to better supply of nutrients which led to the better plant height, more number of green leaves, high value of LAI, increment in SPAD values and significant dry matter accumulation. All such improvement in growth parameter reflected profound growth and development and finely resulted significant increase in yield attributes of baby corn along with fodder yield. Saha and Mondal (2006) [15], Panwar and Munda (2006), Singh and Choudhary (2008) [19], Sahoo and Mahapatra (2007) and Panwar (2008) further advocated similar effect of fertility as it has been observed in the present study. That might be due to better supply of nutrients, improved growth parameters and significant increase in yield attributes of baby corn.
Zinc significantly improved green fodder yield (277.7q ha⁻¹) with successive increase in zinc level up to 5.0 kg Zn ha⁻¹. However, baby corn yield (13.38 q ha⁻¹) could not vary significantly with application of 5.0 kg Zn ha⁻¹. This might be due to zinc involved in various metabolic functions and enhances synthesis of growth hormones and protein. It is needed in the production of chlorophyll and metabolism of carbohydrate, may be resulted in higher chlorophyll contents and higher yield attributes, and this had apparently a positive effect on photosynthetic activity, synthesis of metabolites and growth-regulating substances, oxidation and metabolic activities and ultimately better growth and development of crop, which led to increase in yield attributes and yield of baby corn. The results were in conformity with Meena et al. (2013) [12], Shivay and Prasad (2014) [17]. Zinc fertilization has beneficial effect on physiological process, plant metabolism and plant growth, which leads to higher yield. Increase in cob and corn yield with application of zinc was also reported by Kumar and Bohra (2014) [6].

3.4 Effect of plant geometry, fertility and zinc on quality of baby corn fodder
- Perusal of Table 3 reveals that highest percentage of protein, nitrogen, phosphorus, potassium and zinc had found in P₁ (paired row) plant geometry. The planting geometry of P₁ paired row was attributed due to the wider crop geometry had helped the individual plants to make better spatial utilization of available moisture, nutrients and higher interception of solar radiation with lesser competition which contributed towards more dry matter production per plant and ultimately enhancement of the quality parameter of baby corn fodder.
  - Increase in fertility level upto F₃ (180:90:90 kgN:P₂O₅:K₂O ha⁻¹) significantly higher percentage of protein, nitrogen, phosphorus, potassium while higher
percentage of zinc was obtained with F1 (120:60:60 kgN:P2O5:K2O ha\(^{-1}\)) level of fertility. Consequently, the N, P and K being involved in physico-chemical reactions in plant body of baby corn did behave accordingly to their effect on plant system and enhanced the values of quality parameters. Ramachandrappa et al. (2004a) \(^{(14)}\) observed highest values of protein, sugars, N, P and K content in baby corn with application of 150-75-40 kg NPK ha\(^{-1}\). The availability of nutrients elements (N, P, K) to the crop plants did occur in balanced and adequate proportion in due course of life of the crop. As for as, nitrogen plays a vital role in division and elongation of plants cells and finally luxuriant growth of the crop. Adequate availability and uptake of phosphorus stimulates the root development which provided better distribution of absorbing network and greater root surface. Potassium promotes the photosynthetic activity, flow of assimilates, translocation and storage of assimilates. The nitrogen, phosphorus and potassium being involved in physico-chemical reactions in plant of maize behave accordingly to their effect on plant system and enhanced the values of quality parameters of green fodder (protein, N, P and K) in the present study. Ramachandrappa et al. (2004) \(^{(14)}\), Kar et al. (2006) and Muthukumar et al. (2007) also elucidated the facts on the basis of the results obtained in their studies where in, these qualities characters got improved due to increase in the levels of N, P, K and Zn fertilization.

- Application of zinc significantly affected the quality parameters of baby corn fodder. Zinc level had improved the percentage of protein, nitrogen, potassium and zinc content green fodder of baby corn with successive increase in zinc level up to Zn\(_2\) (5.0 kg ha\(^{-1}\)). Quality parameters increased owing to zinc application which take part in metabolism of plant as an activator of several enzymes and in turn may directly or indirectly affect the synthesis of carbohydrate and protein. These results are in conformity with the results of Arya and Singh (2000). However, zinc doses could not affect the phosphorous content in fodder of baby corn.

### Table 1: Effect of plant geometry, fertility and zinc level on growth characters at different crop growth stages of baby corn

| Treatments | Plant height (cm) | Leaf Area Index |
|------------|------------------|----------------|
|            | 15 DAS | 30 DAS | 45 DAS | At harvest | 15 DAS | 30 DAS | 45 DAS | At harvest |
| Plant geometry | | | | | | | | |
| P\(_1\) (40x20 cm) | 32.18 | 78.76 | 157.30 | 203.67 | 0.26 | 1.26 | 2.46 | 3.75 |
| P\(_2\) (50X15 cm) | 34.33 | 87.09 | 169.20 | 212.07 | 0.27 | 1.39 | 2.88 | 4.26 |
| P\(_3\) (Paired row) | 33.33 | 83.57 | 165.41 | 205.63 | 0.27 | 1.28 | 2.58 | 4.12 |
| S Em ± | 0.86 | 1.40 | 2.12 | 1.59 | 0.01 | 0.02 | 0.06 | 0.08 |
| CD (P=0.05) | NS | 5.48 | 8.31 | 6.26 | NS | 0.07 | 0.25 | 0.30 |

**Fertility level (N:P2O5:K2O kg ha\(^{-1}\))**

| Treatments | 15 DAS | 30 DAS | 45 DAS |
|------------|--------|--------|--------|
| F\(_1\) (120:60:60) | 32.53 | 79.11 | 159.00 |
| F\(_2\) (150:75:75) | 33.20 | 84.70 | 164.15 |
| F\(_3\) (180:90:90) | 34.11 | 85.61 | 168.76 |
| S Em ± | 0.97 | 1.24 | 1.73 | 1.96 |
| CD (P=0.05) | NS | 3.83 | 5.32 | 6.04 |

**Zinc level (Zn kg ha\(^{-1}\))**

| Treatments | 15 DAS | 30 DAS | 45 DAS |
|------------|--------|--------|--------|
| Z\(_1\) (2.5 kg ha\(^{-1}\)) | 32.66 | 81.94 | 162.36 |
| Z\(_2\) (5.0 kg ha\(^{-1}\)) | 33.90 | 84.35 | 165.58 |
| S Em ± | 0.32 | 0.68 | 1.31 | 1.59 |
| CD (P=0.05) | 0.94 | 2.04 | NS | NS |

### Table 2: Effect of plant geometry, fertility and zinc level on growth characters, yield of baby corn and green fodder

| Treatments | Dry matter accumulation (g plant\(^{-1}\)) | SPAD Value |
|------------|------------------------------------------|-------------|
|            | 15 DAS | 30 DAS | 45 DAS | At harvest | 15 DAS | 30 DAS | 45 DAS | At harvest |
| Plant geometry | | | | | | | | |
| P\(_1\) (40x20 cm) | 10.75 | 38.96 | 82.70 | 101.29 | 29.82 | 38.45 | 44.10 | 45.57 |
| P\(_2\) (50X15 cm) | 10.65 | 36.53 | 80.68 | 97.84 | 31.82 | 37.92 | 43.39 | 44.72 |
| P\(_3\) (Paired row) | 11.04 | 42.34 | 88.75 | 103.35 | 32.31 | 40.81 | 45.97 | 47.54 |
| S Em ± | 0.25 | 1.10 | 1.28 | 1.04 | 0.69 | 1.66 | 0.50 | 0.52 |
| CD (P=0.05) | NS | 4.31 | 5.03 | 4.09 | NS | NS | 1.98 | 2.03 |

**Fertility level (N:P2O5:K2O kg ha\(^{-1}\))**

| Treatments | 15 DAS | 30 DAS | 45 DAS |
|------------|--------|--------|--------|
| F\(_1\) (120:60:60) | 10.52 | 34.19 | 79.45 | 98.75 | 29.39 | 36.72 | 41.81 | 42.97 |
| F\(_2\) (150:75:75) | 10.86 | 38.67 | 84.80 | 100.64 | 31.77 | 39.33 | 45.00 | 46.28 |
| F\(_3\) (180:90:90) | 11.07 | 44.97 | 87.88 | 103.08 | 32.80 | 41.13 | 46.64 | 48.58 |
| S Em ± | 0.29 | 0.90 | 0.50 | 0.78 | 0.64 | 0.71 | 0.22 | 0.80 |
| CD (P=0.05) | NS | 2.76 | 1.55 | 2.42 | 1.97 | 2.19 | 0.69 | 2.45 |

**Zinc level (Zn kg ha\(^{-1}\))**

| Treatments | 15 DAS | 30 DAS | 45 DAS |
|------------|--------|--------|--------|
| Z\(_1\) (2.5 kg ha\(^{-1}\)) | 10.78 | 39.17 | 82.50 | 99.90 | 31.29 | 38.69 | 43.96 | 44.94 |
| Z\(_2\) (5.0 kg ha\(^{-1}\)) | 10.85 | 39.38 | 85.59 | 101.75 | 31.39 | 39.43 | 45.02 | 46.95 |
| S Em ± | 0.18 | 0.82 | 0.37 | 0.40 | 0.31 | 0.24 | 0.20 | 0.31 |
| CD (P=0.05) | NS | NS | 1.10 | 1.19 | NS | 0.72 | 0.59 | 0.93 |
Table 3: Effect of plant geometry, graded fertility and zinc level on quality of baby corn and fodder

| Treatments | Number of days to cob harvest | Yield (q ha\(^{-1}\)) | Fodder quality parameters |
|------------|-----------------------------|------------------------|--------------------------|
|            | 50 % cob harvest  | 75 % cob harvest | 100 % cob harvest | Baby corn | Green fodder | Protein (%) | Nitrogen (%) | Phosphorous (%) | Potassium (%) | Zinc (ppm) |
| Plant geometry |                       |                        |                        |           |              |           |            |                 |              |            |
| P\(_1\) (40x20 cm) | 55.28                | 57.67                 | 59.72                 | 13.06     | 265.20      | 8.76      | 1.405      | 0.264          | 1.893        | 25.94      |
| P\(_2\) (50X15 cm) | 55.61                | 57.94                 | 59.39                 | 12.09     | 284.24      | 8.65      | 1.385      | 0.217          | 1.711        | 21.89      |
| P\(_3\) (Paired row) | 54.72                | 57.00                 | 60.67                 | 14.34     | 267.82      | 9.50      | 1.522      | 0.285          | 1.959        | 26.89      |
| S Em ±      | 0.32                 | 0.12                  | 0.39                  | 0.21      | 3.58        | 0.14      | 0.023      | 0.002          | 0.028        | 0.52       |
| CD (P=0.05) | NS                   | 0.45                  | NS                    | 0.83      | 14.05       | 0.57      | 0.090      | 0.010          | 0.110        | 2.04       |

Fertility level (N:P:K O kg ha\(^{-1}\))

| Treatments | F\(_1\) (120:60:60) | F\(_2\) (150:75:75) | F\(_3\) (180:90:90) | Mean |
|------------|---------------------|---------------------|---------------------|------|
| P\(_1\) (Paired row) | 55.83               | 57.78               | 59.33               | 12.05 | 266.10 | 8.26 | 1.324 | 0.223 | 1.668 | 27.89 |
| P\(_2\) (Paired row) | 55.22               | 57.28               | 60.00               | 13.52 | 272.25 | 8.94 | 1.433 | 0.251 | 1.914 | 24.17 |
| P\(_3\) (Paired row) | 54.56               | 57.56               | 60.44               | 13.92 | 278.91 | 9.70 | 1.556 | 0.284 | 1.981 | 22.67 |

S = Em ± 0.16 0.08 0.10 0.17 1.34 0.07 0.012 0.003 0.015 0.38

CD (P=0.05) NS NS NS 0.30 0.52 4.14 0.22 0.037 0.010 0.046 1.19

Zinc level (Zn kg ha\(^{-1}\))

| Treatments | Z\(_1\)(2.5) | Z\(_2\)(5.0) | S Em ± | CD (P=0.05) |
|------------|-------------|-------------|--------|-------------|
| P\(_1\) (Paired row) | 55.26 | 57.52 | 59.81 | 12.95 | 267.14 | 8.72 | 1.397 | 0.254 | 1.812 | 23.85 |
| P\(_2\) (Paired row) | 55.15 | 57.56 | 60.04 | 13.38 | 277.70 | 9.22 | 1.478 | 0.251 | 1.897 | 25.96 |
| S Em ± | 0.09 | 0.07 | 0.08 | 0.13 | 0.94 | 0.03 | 0.004 | 0.003 | 0.009 | 0.24 |

CD (P=0.05) NS NS NS 2.78 0.08 0.013 0.008 0.026 0.72

4. Conclusion

It may be concluded that paired row plant geometry with application of 180:90:90 kg N:P:K O ha\(^{-1}\) along with Zinc 5.0 kg ha\(^{-1}\) may be recommended for better growth parameters, green fodder yield and quality parameters of baby corn fodder.

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