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Effect of spacing and nutrient management in Naga King Chilli for its quality attributes and soil nutrient status under poly-house condition

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Abstract
The present investigation was conducted at the Vegetable Research Farm College of Horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh in the year 2017- 2018. Where a local landrace genotype from Manipur was collected and the experiment was done in a factorial RBD with two factors (spacing and Nutrient) i.e. 3 spacing levels S_1 (60 cm x 60 cm), S_2 (60 cm x 75 cm), S_3 (60 cm x 90 cm) and 3 nutrient levels N_1 (90:45:45 kg NPK/ha + 20 t FYM/ha), N_2 (120:60:60 kg NPK/ha +15 t FYM/ha) and N_3 (150:75:75 kg NPK/ha + 10 t FYM/ha) with 3 replication and 9 treatments to study the effect of spacing and nutrient management in Naga King Chilli (*Capsicum chinense* Jacq.) for its quality attributes and soil nutient status under polyhouse condition. Among the spacing taken the quality attributes like Vitamin-C, capsaicin contents and Dry matter i.e. 84.88(mg/100g), 2.95% and 9.63% respectively, were found maximum spacing S_3. Among the nutrient dose, the maximum Vitamin-C, capsaicin and dry matter i.e. 80.24 (mg/100g), 3.02% and 10.17% respectively were found in N_3. The TSS ranges were recorded between (3.6 - 4.3) ^{o} Brix in Green fruit and (6.4 -7) ^{o} Brix in red ripe fruit among the S x N levels treatments. Whereas the interaction effects on S x N levels on fruit quality parameters shows significant result in capsaicin and dry matter but shows non significant in TSS, and vitamin - C. The available NPK in soil after the harvest was significantly influenced by the nutrient levels. Maximum NPK content of 446.00, 58.51 and 348.45 kg/ha in soil was obtained from nutrient level N_3 and least NPK content of 379.10, 37.96 and 280.62 kg/ha was obtained from nutrient level N_1. Interaction of spacing and nutrient levels did not bring about any significant difference in available nitrogen and potassium content in soil after harvest. While the interaction of spacing and nutrient levels showed significant different in Phosphorus content in the soil. Spacing level S_3 and nutrient level N_3 obtained the best result.

Keywords: Naga King Chilli, spacing, nutrient, soil, quality attributes

Introduction
Naga King Chilli (*Capsicum chinense* Jacq.) is a type of chilli belonging to Solanaceae family which is found mostly in the region of North East India.It is consider as vegetable crop as well as a spice crop among the people of North East India. It is abundantly grown in these parts of the region due to its suitable environmental condition. The Naga King Chilli is known for its pungency, color and taste. It has rich source of Vitamin-C and Capsaicin. The plant is woody perennial semi-shrub were the fruit is conical to sub-conical in shape with about 6 to 8.5 cm length and 2.5 to 3 cm of breadth. The mature fruit may weigh up to about 9g with 19 to 34 seeds (Barik *et al*., 2017) [4]. It is considered among the hottest chilli in the world having Scoville heat units (SHUs) rating of 1,001,304 (Bosland and Baral 2007) [6]. The Naga King Chilli is known with different name by the indigenous people of the region i.e. U-morok in Manipur (Sanatombi *et al*., 2010: Verma *et al*., 2013; Meetei *et al*., 2016) [19, 24, 15] Raja Mircha in Nagaland, Bhut Jolokia in Assam. The people of North East India especially Manipuri, Nagas and Assamese prefer pungent hot cuisine in their traditional food. So, Naga King Chilli has a local, traditional and economic importance. The Nagaland Government obtained the Geographical Indication (GI) of Goods tag for Naga King Chilli in the year (Registration and Protection) Act 1999 (Meetei *et al*., 2016) [15]. Due to its popularity and high demand in the local market and aboard a proper research in its spacing and nutrient application to increase quality attributes is necessary. The lack of proper established variety is a huge drawback to fully understand this crop and more research in this type of chilli is required. Research in spacing and nutrient application of Naga King Chilli is not fully well documented.

Nitrogen(N), Phosphorus(P), Potassium(K) are considered the major mineral nutrients. Fertilizers and proper spacing are one of the main factors for enhancing the crop morphological and quality attributes leading to more production and productivity. In order to achieve higher yields and quality, soil health is a critical factor. Therefore, chemical fertilizers must be integrated with organic manures.Nitrogen provides good plant establishment and growth. The productivity of chilli is highly responsive to N fertilizer (Bhuvaneswari *et al*., 2013) [5]. Phosphorus shortage restricted the plant growth and remains immature (Hossain, 1990; Islam *et al*., 2018) [10, 11]. Phosphorus also increasing the tissue content without enhancing smooth biomass accumulation (Santos *et al*., 2004; Islam *et al*., 2018) [20, 11] Potassium involves in the regulation of stomata, activation and regulation of enzyme activity and the maintenance of turgor and osmotic equilibrium. It also plays important roles in the activation and regulation of enzyme activity (Bhuvaneswari *et al*., 2013) [5] High yields of *Capsicum* have been obtained in the tropics mainly through the use of improved genotypes, fertilizers and good cultural practices (Bhuvaneswari *et al*., 2013) [5].The improvement of crop yield and maintaining soil fertility are mostly relied on inorganic fertilizers.The present research highlights the interaction effect of spacing and nutrient management in Naga King Chilli for its quality attributes and soil status.

Materials and Methods

The experiment was conducted at the Vegetable Research Farm of College of Horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh (28˚04′45″N, 95˚19′33″E) in the year 2017- 2018. The temperature inside the polyhouse is generally 4-7 ^{0}C higher than the outside condition. The layout of entire experiment along with the treatments was carried out Factorial RBD and the genotype used in this experiment was a local landrace genotype collected from Ukhrul District, Manipur (25˚10′25″ N, 99˚26′23″ E). The size of the plot was 3m x 1m with 3 replication and 9 treatments. While the treatment details of the experiment are given below

Spacing

S_1: 60 cm x 60 cm
S_2: 60 cm x 75 cm
S_3: 60 cm x 90 cm

Nutrient

N_1: 90:45:45 kg NPK/ha + 20 t FYM/ha
N_2: 120:60:60 kg NPK/ha +15 t FYM/ha
N_3: 150:75:75 kg NPK/ha + 10 t FYM/ha

Treatment combination

$T_1 = S_1N_1$: 60 cm x 60 cm + 90:45:45 kg NPK/ha + 20 t FYM/ha
$T_2 = S_1N_2$: 60 cm x 60 cm + 120:60:60 kg NPK/ha +15 t FYM/ha
$T_3 = S_1N_3$: 60 cm x 60 cm + 150:75:75 kg NPK/ha + 10 t FYM/ha
$T_4 = S_2N_1$: 60 cm x 75 cm + 90:45:45 kg NPK/ha + 20 t FYM/ha
$T_5 = S_2N_2$: 60 cm x 75 cm + 120:60:60 kg NPK/ha +15 t FYM/ha
$T_6 = S_2N_3$: 60 cm x 75 cm + 150:75:75 kg NPK/ha + 10 t FYM/ha
$T_7 = S_3N_1$: 60 cm x 90 cm + 90:45:45 kg NPK/ha + 20 t FYM/ha
$T_8 = S_3N_2$: 60 cm x 90 cm + 120:60:60 kg NPK/ha +15 t FYM/ha
$T_9 = S_3N_3$: 60 cm x 90 cm + 150:75:75 kg NPK/ha + 10 t FYM/ha

In order to investigate the quality of Naga King Chilli fruit from different treatment the parameters taken for quality attributes i.e. TSS (^{0} Brix), dry matter content, Ascorbic acid content (mg/100g) and Capsaicin content (%) were observed. And for analysing the quality parameters the following methods were used.

Total soluble solids (^{0} Brix)

Freshly harvested king chilli fruits were crushed and the juice extract was placed in hand held refractometer and observations were recorded.

Fresh to dry weight ratio or dry matter content

100 g of freshly harvested fruits were dried at 50 °C at oven for 24-48 hrs. After drying the samples were weighed and the fresh to dry weight ratio or dry matter content (%) was calculated by using the formula
Dry matter content = dry weight / fresh weight x 100

Ascorbic acid content (mg/100g)

Ascorbic acid determination Vitamin C was estimated by the method described in AOAC (1984) [2]. 1.0 g freeze dried powder was macerated with 10 ml of 0.4% oxalic acid in water and centrifuged at 8,000 rpm. The 500 µl and 1000 µl aliquots of the supernatant in triplicate were maintained to 3.0 ml by 0.4% oxalic acid followed by the addition 7.0 ml of 2,6-dichlorophenol indophenol dye solution. The test mixture was properly mixed and its absorbance was recorded immediately at λ_{max} 518 nm in UV-Varian Cary 50 spectrophotometer. The amount of Vitamin C was calculated by comparison with standard curve and expressed as mg/100 g.

Capsaicin content (%)

The capsaicin content was determined by the spectrophotometric method as described by (Balasubramaniam *et al*., 1982; Dubey *et al*., 2015) [3, 8] 50 mg of dried material was taken in volumetric flask to which 10 ml of dry acetone was added and subjected to 3 h continuous shaking, then centrifuged at 10,000 rpm for 10 min. 1 ml of clear supernatant was pipetted out and allowed to evaporate to dryness in hot water bath. Residue was dissolved in 5 ml of 0.4% sodium hydroxide solution, followed by addition of 3 ml of 3% phosphomolybdic acid and allowed to stand for 1 h. The solution was filtered and centrifuged at 5000 rpm for 10–15 min. The absorbance of the blue colored solution was read at 650 nm against blank in a UV spectrophotometer. The concentration of capsaicin in the sample was calculated from the slope of the standard curve and expressed as percent.

$$\text{Capsaicin content (\%)} = \frac{\text{mg Capsaicin x 100 x 100}}{\text{1000 x 1000 x 1 x 2}}$$

Estimation of soil nutrients

pH of soil

Soil pH was determined using the pH meter before sowing and after harvest of king chilli. Soil samples (20 g) in distilled water (50 ml) were kept in electric shaker for 30 minutes and pH reading was recorded.

Soil Organic carbon content (%)

Organic carbon estimation was done by (Walkley and Black 1934) [25] methods. In this method 0.5 g soil samples were taken in 500 ml conical flask followed by addition of 10 ml 1N $K_2Cr_2O_7$ and 20 ml concentrated H_2SO_4 through the sides of the conical flask. The contents were shaken gently to mix and allowed to stand for 30 minutes. Distilled water (200 ml) and 85% H_3PO_4 (10 ml) was added after 30 minutes. The sample was titrated with 0.5 N Ferrous Ammonium Sulphate (FAS) after addition of Diphenylamine indicator (1 ml) till the end point changes from violet blue to bright green. A blank was also prepared similar to soil procedure but without the soil. The organic carbon (%) in the soil was calculated by using the formula:

% Organic carbon in soil = N x (B-S) x 0.003 x 100/ W

Where N = Normality of FAS, B = Blank burette reading (ml), S = Sample burette reading (ml) and W = weight of the soil sample.

Available Nitrogen (kg/ha)

Nitrogen content in soil was estimated by following the methods given by (Subbiah and Asija 1956) [23] in automatic Nitrogen Analyser. Soil samples were placed in a distillation flask followed by addition of 0.32% $KMnO_4$ and 2.5% NaOH (25 ml each). 2.5% boric acid (25 ml) and indicator (methyl red) was transferred into a conical flask. Digestion process was initiated and completed in 10 minutes followed by titration with 0.02 N hydrochloric solution till end point of pink colour was obtained. The nitrogen content in soil was calculated with the formula

Available nitrogen in soil (ppm) N = V × (14/1000 x 0.02 x 10^6/w)

Available nitrogen in soil (kg/ha) = N × x 2.24

Where, V = Volume of 0.02 N HCl solution used for titration.

W= weight of the sample.

Estimation of Available Phosphorus (kg/ha)

The soil samples had a pH of 5.5 or less. Thus, Phosphorus estimation was carried out by (Bray and Kurtz method 1945) [7]. Firstly solution extract was prepared by dissolving 1.11 g of NH_4F solution in 400 ml of distilled water in 1000 ml volumetric flask followed by addition of 25 ml standard 1N HCL solution and the volume was made up to 1000 ml. 5 g of soil samples were taken in conical flasks of 100 ml capacity followed by addition of 50 ml extracting solution (NH4F-HCL) and 1 spoonful of activated charcoal. The contents were kept in electric shaker for 10 minutes and filtered with Whatman No.1 filter paper. 5 ml of the filtrate was taken in 25 ml volumetric flask. 5 ml of Ammonium molybdate solution and 1 ml freshly prepared stannous chloride ($SnCl_2$) solution was added and volume was made up to 25 ml. The solution was mixed thoroughly and kept for 10 minutes.

After 10 minutes readings were taken in a spectrophotometer at 660 nm. Standard curve was also prepared by following all the steps but taking 0, 1, 2, 3, 4, 5 ml of 2.5 ppm Phosphorus solution. Available Phosphorus (kg/ha) was calculated by using the formula:

P (kg/ha) = Concentration of Phosphorus from the curve x dilution factor x 2.24

Estimation of Available Potassium (kg/ha)

The available potassium (K) of the soil sample was estimated by flame photometric method as described by (Jackson 1973) [12]. 5 g of the soil sample was taken followed by addition of 25 ml of neutral normal ammonium acetate (NH_4OAc). The content was shaken in electric shaker for 30 minutes and then filtered with Whatman No.1 filter paper. A blank was also prepared and used for analysis. The filter in flame photometer was set at 768 nm and emission readings of soil extracts and standard solutions were recorded. Potassium standards were prepared by taking 40, 60, 80 and 100 ppm potassium, respectively. The K content in soil was calculated by using the formula given below:

$$\text{Extractable K (ppm)} = \frac{\text{K ppm from the curve}}{\text{WS}} \times \text{TV}$$

Available K in soil (kg/ha) = Extractable K × 2.24

Where, TV = Total volume of extract and WS = weight of the sample.

Statistical Analysis

Statistical analysis was done as per (Gomez and Gomez 1984) [9] and also by using OPSTAT software (Sheoran *et al.*, 1998) [22] and WASP 2.0 online analysis.

Result and Discussion

Total soluble solids

As shown in table 1 and 2, the TSS of the mature green fruits was found to be non-significant regardless of the different spacing levels but significant difference in TSS of the red ripe fruit was observed. In green fruits, the highest TSS was obtained from spacing level S_3 (4.2 º brix) and lowest TSS (3.8 º brix) was recorded in S_1. While, in red ripe fruits the highest TSS (7.0 º brix) was obtained in spacing level S_3 and lowest TSS (6.6 º brix) in S_1. The TSS of the red ripe fruits was found to be significantly higher than the green fruits because of higher accumulation of soluble solids at the maturity stage.

No significant result was obtained from different nutrient levels, both in green and red ripe stage of the fruits. The TSS of the fruit increased with increased spacing levels while nutrient levels did not have much effect on the TSS of the fruit. The TSS of the red ripe fruit was always higher than the mature green fruits regardless of different spacing and nutrients levels. Similarly, the interaction of spacing and nutrient level also did not bring about any significant change in TSS content of fruit at mature green as well as red ripe stage.

Vitamin-C content

As shown in table 1 and 2, the highest Vitamin-C content was recorded in spacing level S_3 with an average of 84.88 mg/100g and the lowest of 67.91 mg/100g was obtained in spacing level S_1.The better result obtained in S_3 might be because of more physiological activity in plants grown at wider spacing while the plants grown in close spacing resulted in competition among themselves. Different nutrient levels also had significant effect on the Vitamin-C content of the fruit. Among the various nutrient levels highest Vitamin-C content was obtained in nutrient level N_3 (80.24 mg/100g) and lowest in N_1 (74.75 mg/100g). (Oribiyi *et al.*, 2015) [18] also reported similar observations. The interaction of spacing and nutrient level did not bring about any significant effects on Vitamin-C content of the fruit.

Capsaicin content (%)

As shown in table 1 and 2, among all the different spacing levels, the highest capsaicin content of 2.95% was obtained from spacing level S_3 and lowest in S_1 with 2.92% capsaicin. The higher capsaicin content in spacing level S_3 might be because of more leaf exposure to light and also lesser competition with adjoining plants. Different nutrient levels also had significant effect on capsaicin content. The highest capsaicin content of 3.02% was found in nutrient level N_3 and lowest in N_1 with an average of 2.79%. The significant increase in capsaicin content in N_3 may be because of more nutrient supply to the crop resulting in higher synthesis of capsaicin in the fruit.(Koshale *et al.*, 2018) [14] has also reported similar results on capsaicin contents with increasing nutrients level.

The interaction of S x N levels had significant effect on capsaicin content of the fruit. S_2N_2 recorded highest capsaicin content (3.23%) and minimum in S_1N_1 (2.81%). The result may be attributed to higher nutrient dose and coupled wider spacing levels for the synthesis of capsaicin. Similar reports were also made by (Koshale *et al.*, 2018) [14].

Dry matter content (%)

As shown in table 1 and 2, the highest value of dry matter content in the fruit was obtained from S_3 (9.63%) and N_3 (10.17%). Wider spacing and increased nutrient dose resulted in fruits to have more dry matter. Increased physiological activity and more accumulation of fruit components in those plants grown in plots with more nutrient dose and wider spacing levels**.** However, the interaction of S x N levels had no significant effect on dry matter content of the fruit.

Table 1: Effect of various spacing and nutrient levels on fruit quality parameters

Treatments	TSS (º Brix)		Vitamin-C (mg/100g)	Capsaicin content (%)	Dry matter (%)
	Green	Red			
Spacing levels					
S_1	3.8	6.6	67.91	2.92	9.28
S_2	3.9	6.8	80.66	2.94	9.62
S_3	4.2	7.0	84.88	2.95	9.63
SE(d) ±	0.18	0.08	1.05	0.004	0.08
C.D. 5%	NS	0.17	2.24	0.009	0.17
Nutrient levels					
N_1	3.8	6.7	74.45	2.79	9.06
N_2	4.0	6.8	78.76	2.99	9.30
N_3	4.2	6.8	80.24	3.02	10.17
SE(d)±	0.18	0.08	1.05	0.004	0.08
C.D. 5%	NS	NS	2.24	0.009	0.17

NS = Non Significant, **S_1**= (60 x 60) cm, **S_2**= (60 x 75) cm, **S_3**= (60 x 90) cm, **N_1** = 90:45:45 kg NPK/ha + 20t FYM/ha, **N_2**=120:60:60 kg NPK/ha +15t FYM/ha, **N_3** =150:75:75 kg NPK/ha + 10t FYM/ha.

Table 2: Interaction effects of S x N levels on fruit quality parameters

Treatments	TSS (º Brix)		Vitamin-C (mg/100g)	Capsaicin (%)	Dry matter (%)
	Green	Red			
S x N levels					
S_1N_1	3.6	6.4	64.47	2.81	8.74
S_1N_2	3.8	6.6	68.67	2.82	9.09
S_1N_3	4.1	6.6	70.6	3.13	10.03
S_2N_1	3.8	6.8	78.18	2.76	9.33
S_2N_2	3.7	6.8	82.2	3.23	9.32
S_2N_3	4.1	6.9	81.6	2.83	10.21
S_3N_1	4.1	6.9	80.71	2.81	9.12
S_3N_2	4.3	7.0	85.4	2.92	9.48
S_3N_3	4.3	7.0	88.53	3.11	10.29
SE(d)±	0.32	0.14	1.82	0.007	0.14
C.D. 5%	NS	NS	NS	0.015	NS

NS = Non Significant, **S_1**= (60 x 60) cm, **S_2**= (60 x 75) cm, **S_3**= (60 x 90) cm, **N_1** = 90:45:45 kg NPK/ha + 20t FYM/ha, **N_2** =120:60:60 kg NPK/ha +15t FYM/ha, **N_3** =150:75:75 kg NPK/ha + 10t FYM/ha.

Table 3: Effect of various spacing and nutrient levels on soil parameters.

Treatment	Soil pH	Organic carbon (%)	Available Nitrogen (kg/ha)	Available Phosphorus (kg/ha)	Available Potassium (kg/ha)
Spacing levels					
S_1	5.86	2.25	426.49	48.93	317.96
S_2	5.93	2.08	408.37	49.99	315.47
S_3	5.87	2.13	408.37	47.56	308.62
SE(d)±	0.04	0.04	8.39	1.62	6.37
C.D. 5%	NS	0.09	8.39	1.62	6.37
Nutrient levels					
N_1	5.91	2.39	379.10	37.96	280.62
N_2	5.92	2.09	418.13	50.01	312.98

N_3	5.82	1.99	446.00	58.51	348.45
SE(d)±	0.4	0.04	8.39	1.62	6.37
C.D. 5%	NS	0.09	8.39	1.62	6.37

NS = Non Significant, **S_1** = (60 x 60 cm), **S_2** = (60 x 75 cm) and **S_3** = (60 x 90 cm) **N_1** = 90:45:45 kg NPK/ha + 20t FYM/ha, **N_2** = 120:60:60 kg NPK/ha +15t FYM/ha, **N_3** = 150:75:75 kg NPK/ha + 10t FYM/ha,

Table 4: Interaction effects of S x N levels on soil parameters.

Treatment	Soil pH	Organic carbon (%)	Available Nitrogen (kg/ha)	Available Phosphorus (kg/ha)	Available Potassium (kg/ha)
S x N levels					
S_1N_1	5.93	2.45	388.86	35.47	285.6
S_1N_2	5.87	2.22	426.49	50.4	319.2
S_1N_3	5.77	2.08	464.12	60.92	349.07
S_2N_1	5.9	2.38	372.14	42.19	281.87
S_2N_2	6.03	1.99	413.95	50.28	313.6
S_2N_3	5.87	1.87	439.04	57.49	350.93
S_3N_1	5.9	2.33	376.32	36.21	274.4
S_3N_2	5.87	2.05	413.95	49.35	306.13
S_3N_3	5.88	2.02	434.86	57.12	345.33
Initial soil data	5.7	1.85	296.87	24.44	230.13
SE(d)±	0.07	0.07	6.8	1.31	5.16
C.D. 5%	NS	NS	NS	2.81	NS

NS = Non Significant, **S_1** = (60 x 60 cm), **S_2** = (60 x 75 cm) and **S_3** = (60 x 90 cm) **N_1** = 90:45:45 kg NPK/ha + 20t FYM/ha, **N_2** = 120:60:60 kg NPK/ha +15t FYM/ha, **N_3** = 150:75:75 kg NPK/ha + 10t FYM/ha,

Nutrient status of the soil before applied treatment.

The initial soil status before application of nutrient treatments (N_1, N_2, N_3) inside the research polyhouse were recorded as pH 5.7, Organic Carbon 1.85(%), available Nitrogen 296.87 (kg/ha), available Phosphorus 24.44 (kg/ha), available Potassium 230.13 (kg/ha) as shown in table 4.

Nutrient status of the soil after harvest

Soil pH and organic carbon

As shown in table 3 and 4, there was no significant difference in the soil pH after harvest was recorded even though slight increase of soil pH occurs, as compared to the soil pH before the experiment which may be because of similar soil texture of the soil. Lowest soil pH of 5.87 was obtained in S_1N_3 and highest in S_2N_2. Similar observations on values of soil pH are also reported by (Kapse *et al*., 2017) [13] and (Ngupok *et al*., 2018) [16].

The soil organic carbon content was significantly influenced by different spacing and nutrient levels. The spacing level S_1 recorded the highest value of 2.25% and lowest of 2.08% in S_2 while among the nutrient levels the highest organic carbon 2.39% and lowest value of 1.99% organic carbon was obtained in nutrient level N_3. The result obtained from nutrient level N_1 having higher organic carbon content may be because of incorporation of higher dose organic farmyard manure which led to more organic carbon content in the soil.

No significant difference was recorded from the interaction of S x N levels on soil pH and organic carbon content after harvest.

Available NPK content in soil after harvest

As shown in table 3 and 4, the available NPK in soil after the harvest was significantly influenced by the nutrient levels. Maximum NPK content of 446.00, 58.51 and 348.45 kg/ha in soil was obtained from nutrient level N_3 and least NPK content of 379.10, 37.96 and 280.62 kg/ha was obtained from the plot with nutrient level N_1. The reason of higher NPK content was obviously because of addition of higher nutrient dose in the soil and the plants were unable to utilise all the nutrients applied in the particular plot. Similar reports were also made by (Akram *et al*., 2017) [1].

Interaction of spacing and nutrient levels did not bring about any significant difference in available nitrogen and potassium content in soil after harvest. While the interaction of spacing and nutrient levels showed significant different in Phosphorus content in the soil.

Conclusion

From the experiment undertaken, it can be concluded that, when (*Capsicum chinense* Jacq) was grown at wider spacing S_3 (60 cm x 90 cm) more Vitamin-C, dry matter and capsaicin contents were obtained. Among the nutrient dose, N_3 (150:75:75 kg NPK/ha + 10 t FYM/ha) appears to be the best, nutrient dose for getting higher vitamin- C, dry matter and capsaicin among the treatments conducted. Above all, the ultimate outcome of better quality (vitamin- C, dry matter and capsaicin content) was found in S_3 and nutrient level N_3. Spacing level S_3 (60 cm x 90 cm) and nutrient level N_3 (150:75:75 kg NPK/ha + 10 t FYM/ha) obtained the best result and can be recommended for growing Naga King Chilli under protected cultivation in pasighat, Arunachal Pradesh.

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