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Effect of foliar application of urea and naphthaleneacetic acid (NAA) on growth and yield of chilli (*Capsicum annum* L.) var Pusa Jwala

Aashish KC, Jitendra Kumar, Vinay Joseph Silas, Harish Giri, Hirendra Khadka and Mukesh Kumar Yadav

Abstract
Field experiment was conducted at agricultural field of Rama University, Kanpur India to evaluate "Effect of foliar application of urea and naphthaleneacetic acid (naa) on growth and yield of chilli (*Capsicum Annum* L.)" The experiment was carried out in a Randomized Block Design (RBD) with 8 treatments individually were counted. The variety Pusa Jwala was selected and the combination of the treatments, were T1(Urea 0% and NAA 0 ppm), T2(Urea 0.5 % and NAA 25 ppm), T3(Urea 0.5% and NAA 50 ppm), T4 (Urea 0.5% and NAA 75 ppm), T5(Urea 1.0% and NAA 25 ppm), T6(Urea 1% and NAA 50 ppm), T7(Urea 1% and NAA 75 ppm), T8 (Urea 1.5% and NAA 25 ppm).
Among all the treatment it was recorded that the maximum was recorded at the T7(Urea 1% and NAA 75 ppm) were it was seen maximum in every treatment parameters like plant height, No of leaves/plant, No of Branches/ plant, No of Flowers/plant, Leaf width, Shoot length, Fruit weight, Single fruit weight, Fruit length, Number of fruit/plants, Fruit breath, Fruit Yield per plant, Yield per hectare (t/ha),Germination percentage % were observed where use of Urea and NAA hormones were quiet effective mine while the minimum was recorded in every parameters individually.

Keywords: Urea, NAA, chilli (pusa jwala), yield

1. Introduction
Vegetables is a part of plant that is consumed by humans as food as part of meal. Vegetables can be eaten either raw or cooked and play an important role in human nutrition being mostly low in fat and carbohydrates but high in vitamins, minerals and dietary fiber. Many nutritionists encourage people to consume plenty of vegetables spice is a see fruit, root, bark or other plant substance primarily used for flavoring, coloring or preserving food. Spices are distinguished from herbs, which are the leave, flowers, or stems from plants used for flavoring or as garnish. Sometimes spices may be ground in to a powder for convenience. Many spices have antimicrobial properties. Chilly (*capsicum annum* L.) Is a very common vegetables mostly used as spice in the diet (pun and karmacharya, 2005.) [24]. It belongs to the family Solanaceae and genus capsicum. Chilly is the third important crop of tropical America and west India and it is believed to have introduced in to India by Portuguese towards the end of fifteenth century. Purthi, 2001 [26] However, cultivation became popular only in the seventeenth century. Both green and dried chilies are virtually an indispensable item in the kitchen. Green chilies are excellent source of vitamins A and C.
Chili is a native crop of tropical America and West Indies. The center of Diversity of the common capsicum annum is Mexico with a secondary center in Guatemala. Within half of a century capsicum had been distributed as far as Asia, and it had been originally in the Americas (Andrews, 1992, 1995, 1998, 1999) [3-4]. Green chilies are rich in vitamin A and C and the seed contain traces of starch. The fruits also contain affixed oil, red coloring matter which is non-pungent and yield 20-25 percent alcoholic extract. The chief constitute of chilli pericarp is a crystalline colorless pungent principle known as capsicutin (C_{18} H_{27} No_3), a condensation product of 3-hydroy-4-methoxy benzyl amine and decylenic acid which produces a highly irritating vapor on heating. The tow chemical groups of greatest interest are capsaicinoids and the carotenoids. Capsaicinoids are the name given to class of compounds found in members of capsicum and are alkaloids that give hot chilli their characteristics pungency. capsaicinoid is measured in scoville scale or ppm or in percent Carotenoids compounds are yellow to red pigments of aliphatic or alicyclic structures composed of isoprene units, which are normally fat-soluble colors (Bunnell and Bauernfeind, 2008).

The main color red is chilli is from carotenoids Capsanthin and capsanthin, the major carotenoids in ripe fruits, contribute up to 60% of the total carotenoids. Capsanthin and caosorbin increase proportionally with advanced stages of ripeness with capsanthin being the more stable of the two (Kanner *et al*, 2005) the rich supply of carotenoids contributes to chilli nutritional value and color (Britton and Hornero-Mendez, 2001).

The green chilli have following composition(per100g of edible matter): moisture 85.7gm,protein 2.9 gm, minerals 1.0gm,fat 0.6gm,fiber 6.8gm, carbohydrate 3.0gm, calcium 30mg,magnesium 24 mg, riboflavin 0.39mg, nicotinic acid 0.9mg, phosphorus 80mg, iron 1.2mg, sulphur 34mg, copper 1.55mg, chlorine 15 mg, vitamin A 292 I.U and vitamin C 111 mg (Das,2008). The red color of fruits at ripening stage is due to presence of pigment 'capsanthin' (Nath, 2006) [22]. The green chilies contain 'rutin' which have medicinal value and is of immense pharmaceutical need (purseglove,).

The origin of chilies is believed to be as old as 7000 B.C. used in Mexico. Chilies were grown and cultivated from 3500 BC. Mexicans used it to spice up their food. Chili was brought to the rest of the world by Christopher Columbus who discovered America in 1493. Christopher had set from Spain to reach India to bring spices such as pepper back to his country. Christopher not only mistook America for India, but also mistook chili as the black pepper. That is how the chili got the name 'chilli pepper.' He took chili pepper back to Spain where it became a very famous spice.

Globally, chilly occupies an area of 1450 thousand hectares worldwide with an annual production of 18,828 thousand tones (FAO, 2000) [17]. In Nepal it covers a total area of 4780 ha and a total production of 15,569 tones with the highest area in banke (432) and lowest area (3ha), it covers an area of 123ha with a total production of 433 tones and average productivity of 3.28t/ha (MOAC, 2006/7). It occupies fourth position as a spice crop after cardamom, ginger, and garlic (MOAC, 2OO6/O7). chilly prefers a warm humid climate during early stages and dry weather towards the maturity of pods. It is grown in both tropical and subtropical areas up to 2000 m above mean sea level. It is grown in areas receiving an annual rainfall of 75-100 cm (Chadha, 2002) [9]. For better growth and yield temperature ranging from 20-30℃ is ideal for chilli production. The dropping off of flower buds, flowers and young fruits in pepper is one of the most important factors limiting the production of this crop (AVRDC, 1986) [5].

Studies on the effect of plant growth regulators in solanaceous fruit and vegetables crops have revealed that the application of some of the plant growth regulator (NAA) has been found effect in reducing the flowers and fruit drops thereby enhancing production on chilly per unit area per unit time. The varying responses of chilli to plant growth regulators have been reported by Chattopdhayay and sen (2006), minraj and shanmugavelu (2004), Balraj *et al.* (2002) and Joshi et,al, (1999). However, information regarding the effectiveness of PGR and growth and yield of chilly is meager. The present study was, therefore conducted with suggest concentration is imposed PGR as foliar spray to determine the effective growth regulators promoting growth and yield in commercial chilly cultivars, namely Jwola and suryamukhi.

Material and Method

The experiment was carried out in a Randomized Block Design (RBD) from Feb 2022 to June 2022 at the Horticulture Farm of Rama University, Mandhana Kanpur, India. The test crop was chilli (pusa jwala). the treatments, were T_1(Urea 0% and NAA 0 ppm), T_2(Urea 0.5 % and NAA 25 ppm), T_3(Urea 0.5% and NAA 50 ppm), T_4 (Urea 0.5% and NAA 75 ppm), T_5(Urea 1.0% and NAA 25 ppm), T_6(Urea 1% and NAA 50 ppm), T_7(Urea 1% and NAA 75 ppm), T_8 (Urea 1.5% and NAA 25 ppm). The experimental field of 130 m^2. The total length of the field is 15.5m and width is 5.0m. The experiment was laid out in factorial RBD considering organic matter and chemical fertilizers as factors. They were evaluated under RBD design with 3 replications and 8 treatments. There were 24 plots and the size of the plot is 2.40×1.20 m. In each plot, 16 saplings were planted. The space between rows is 60×30 cm and plant to plant is 30×30 cm. the main irrigation channel is 1 m and field border is also 1m.

Experimental finding

This research was conducted to evaluate the performance of pusa jwala of chilli on foliar application of urea and NAA on growth and yield in Rama University agricultural field at Kanpur during the year 2021/22.

Effect of foliar application of urea and NAA on growth of chilli

Plan height (cm)

The plant heights of the experimental plants were recorded where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded at 120 days 118.3533 where minimum was recorded at T1 (Urea 0% and NAA 0ppm) where no application was applied was seems to be lowest resulting 63.48.

Table 1: Effect of foliar application of Urea and NAA on plant height

	No of leaves				
Treatment	**Treatments detail**	**30 DAT**	**60 DAT**	**90 DAT**	**120 DAT**
T1	Urea 0% and NAA 0 ppm	31.4	34.49333	36.34	63.48
T2	Urea 0.5 % and NAA 25 ppm	31.2966667	34.61333	36.8	66.40833
T3	Urea 0.5% and NAA 50 ppm	35.28	36.30667	38.38333	73.335
T4	Urea 0.5% and NAA 75 ppm,	39.9766667	40.51	42.45	78.12667
T5	Urea 1.0% and NAA 25 ppm	32.3666667	36.39333	38.45667	82.9
T6	Urea 1% and NAA 50 ppm,	37.4233333	38.54	39.42	72.438
T7	Urea 1% and NAA 75 ppm	41.9333333	43.33333	46.33333	88.353
T8	Urea 1.5% and NAA 25 ppm	32.7733333	37.36667	40.61	64.49
	CD	2.31867284	2.560453	2.788962	2.751015
	SeM	0.62014975	0.684816	0.745933	0.735783

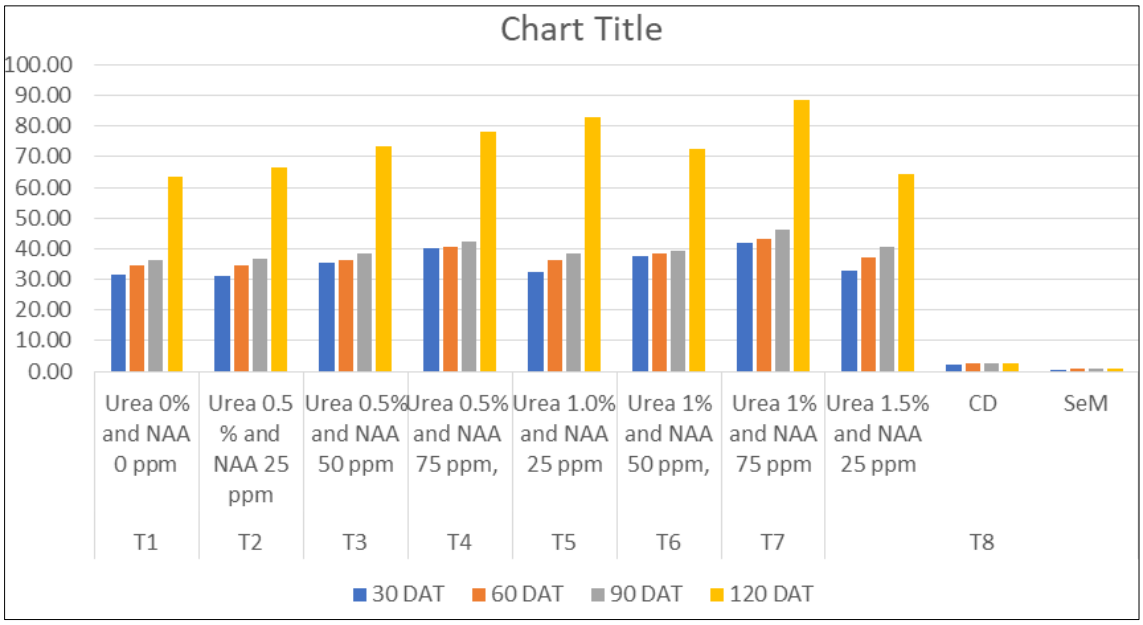

Fig 1: Effect of foliar application of urea and NAA on plant height

No of leaves/plant

Total no of leaves data were taken according to the days of 30 interval upto 120 days of harvesting period where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 118.353 and the minimum was recorded as T1 (Urea 0% and NAA 0ppm) where no application was applied was seems to be lowest resulting 63.480.

Table 2: Effect of foliar application of Urea and NAA on No of leaves

	No of leaves				
Treatment	**Treatments detail**	**30 DAT**	**60 DAT**	**90 DAT**	**120 DAT**
T1	Urea 0% and NAA 0 ppm	60.460	66.500	60.460	63.480
T2	Urea 0.5 % and NAA 25 ppm	62.323	70.493	62.323	66.408
T3	Urea 0.5% and NAA 50 ppm	68.183	78.487	68.183	73.335
T4	Urea 0.5% and NAA 75 ppm,	70.620	85.633	70.620	78.127
T5	Urea 1.0% and NAA 25 ppm	109.513	120.287	109.513	114.900
T6	Urea 1% and NAA 50 ppm,	65.233	79.643	65.233	72.438
T7	Urea 1% and NAA 75 ppm	113.183	123.523	113.183	118.353
T8	Urea 1.5% and NAA 25 ppm	60.483	68.497	60.483	64.490
	CD	2.287	2.623	2.778	3.150
	SeM	0.611	0.701	0.743	0.842

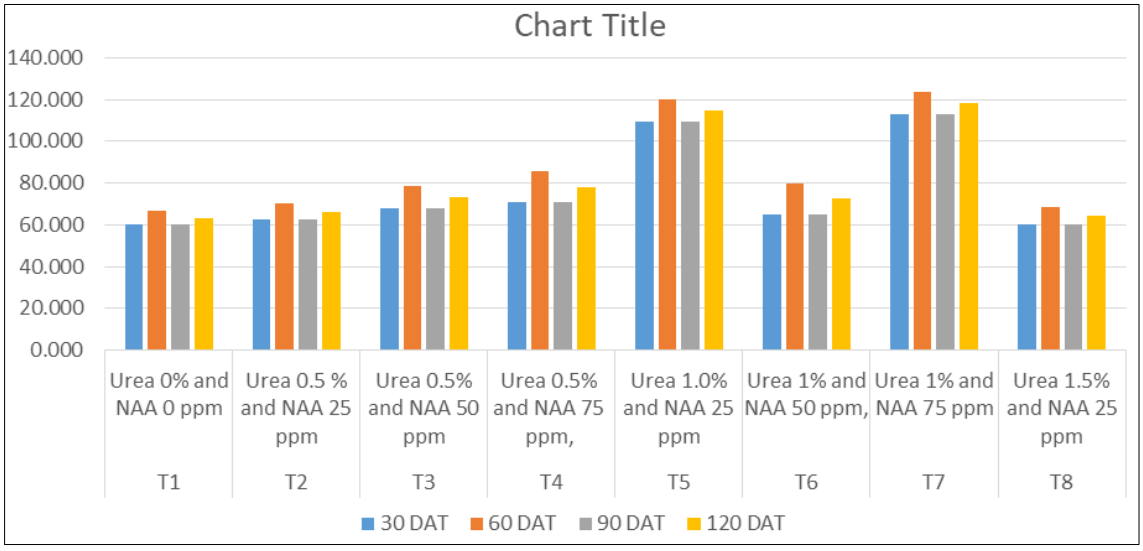

Fig 2: Effect of foliar application of urea and NAA on No of leaves

No of Branches/plant

Total no of branches, data were taken according to the 30 days of interval up to 120 days of harvesting period where treatment of Urea and NAA was applied plant was seen

maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 8.07 and the minimum was recorded as T2 (Urea 0.5 % and NAA 25 ppm) was seems to be lowest resulting 5.15.

Table 3: Effect of foliar application of urea and NAA on No of Branches

	No of branches				
Treatment	**Treatments detail**	**30 DAT**	**60 DAT**	**90 DAT**	**120 DAT**
T1	Urea 0% and NAA 0 ppm	4.397	6.073333	4.40	5.24
T2	Urea 0.5 % and NAA 25 ppm	4.757	5.55	4.76	5.15
T3	Urea 0.5% and NAA 50 ppm	5.250	5.55	5.25	5.40
T4	Urea 0.5% and NAA 75 ppm,	4.783	6.106667	4.78	5.45
T5	Urea 1.0% and NAA 25 ppm	5.490	7.353333	5.49	6.42
T6	Urea 1% and NAA 50 ppm,	4.347	6.323333	4.35	5.34
T7	Urea 1% and NAA 75 ppm	7.113	9.03	7.11	8.07
T8	Urea 1.5% and NAA 25 ppm	4.583	6.856667	4.58	5.72
	CD	1.922	2.147187	1.769504	2.450562
	SeM	0.514	0.574284	0.47327	0.655425

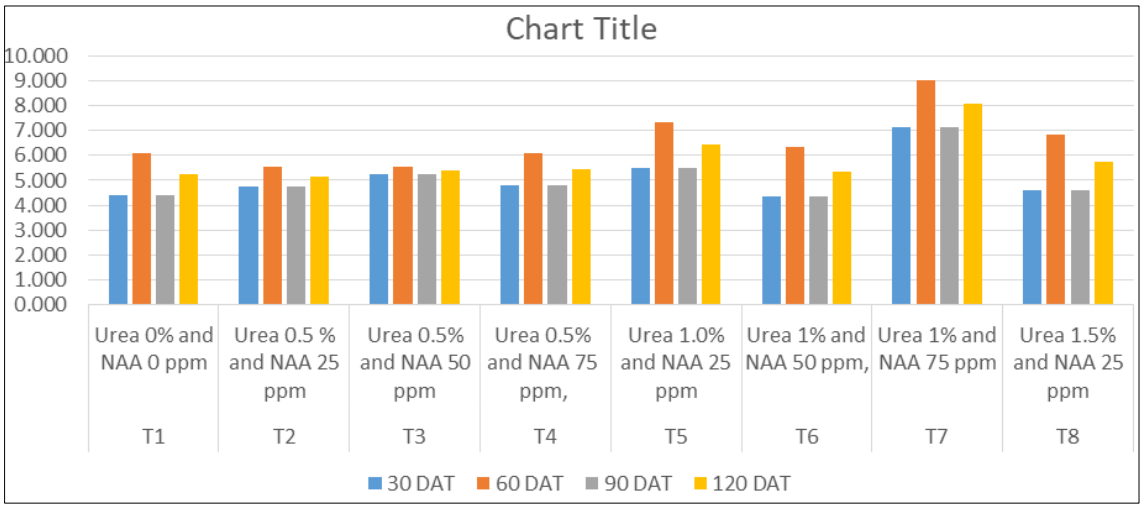

Fig 3: Effect of foliar application of urea and NAA on No of Branches

No of Flowers/plant

Total no of flowers, data were taken according to the 30 days of interval up to 120 days of harvesting period where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 32.81 and the minimum was recorded as T3 (Urea 0.5% and NAA 50 ppm) was seems to be lowest resulting 26.95.

Table 4: Effect of foliar application of urea and NAA on No of Flowers

Treatment	Treatments detail	30 DAT	60 DAT	90 DAT	120 DAT
T1	Urea 0% and NAA 0 ppm	25.960	31.56333	25.96	28.76
T2	Urea 0.5 % and NAA 25 ppm	26.553	31.77	26.55	29.16
T3	Urea 0.5% and NAA 50 ppm	25.363	28.52667	25.36	26.95
T4	Urea 0.5% and NAA 75 ppm,	26.477	35.72667	26.48	31.10
T5	Urea 1.0% and NAA 25 ppm	26.063	31.59667	26.06	28.83
T6	Urea 1% and NAA 50 ppm,	25.860	30.75	25.86	28.31
T7	Urea 1% and NAA 75 ppm	28.313	37.29667	28.31	32.81
T8	Urea 1.5% and NAA 25 ppm	27.180	34.25	27.18	30.72
	CD	4.559	3.016406	3.18542	3.184829
	SeM	1.219	0.806765	0.851969	0.851811

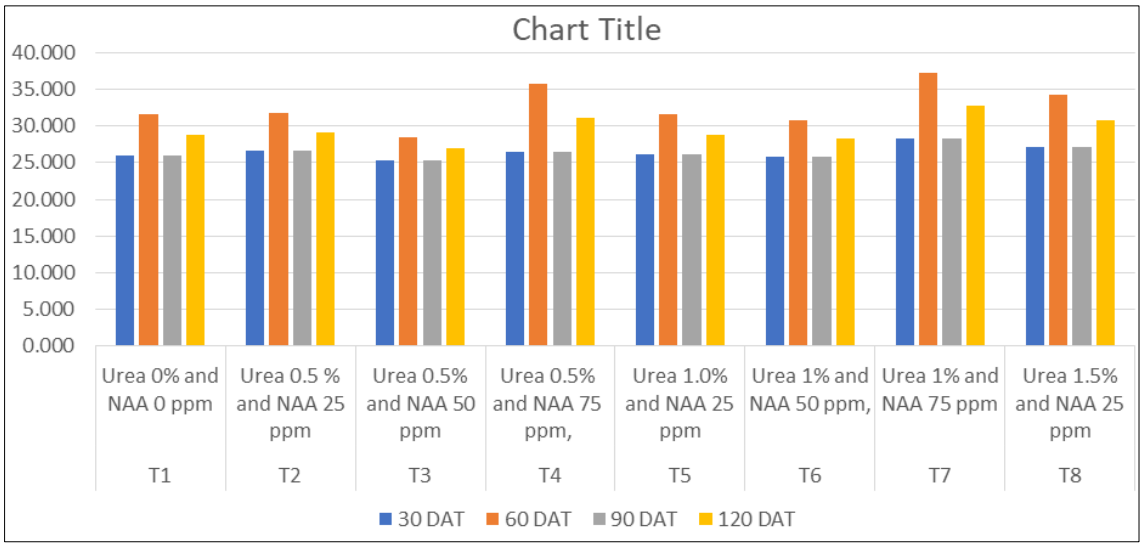

Fig 4: Effect of foliar application of urea and NAA on No of Flowers

Leaf width

The width of fruits was seems to be quiet similar in every treatment where maximum was seen in maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 4.68 followed by T2, T6 AND T1 and the minimum was recorded as T5 (Urea 0.5% and NAA 75 ppm) was seems to be lowest resulting 3.67 and it was followed by T8.

Table 5: Effect of foliar application of urea and NAA on Leaf width

Treatment	Treatments detail	30 DAT	60 DAT	90 DAT	120 DAT
T1	Urea 0% and NAA 0 ppm	2.93	3.49	4.13	4.11
T2	Urea 0.5 % and NAA 25 ppm	2.73	3.02	4.50	4.17
T3	Urea 0.5% and NAA 50 ppm	2.73	3.15	4.20	3.97
T4	Urea 0.5% and NAA 75 ppm,	2.55	2.96	3.92	3.75
T5	Urea 1.0% and NAA 25 ppm	2.85	3.13	3.78	3.67
T6	Urea 1% and NAA 50 ppm,	3.13	3.48	4.24	4.17
T7	Urea 1% and NAA 75 ppm	3.38	3.90	4.79	4.68
T8	Urea 1.5% and NAA 25 ppm	2.89	3.08	3.82	3.67
	CD	0.22	0.32	0.36	0.24
	SeM	0.06	0.08	0.09	0.06

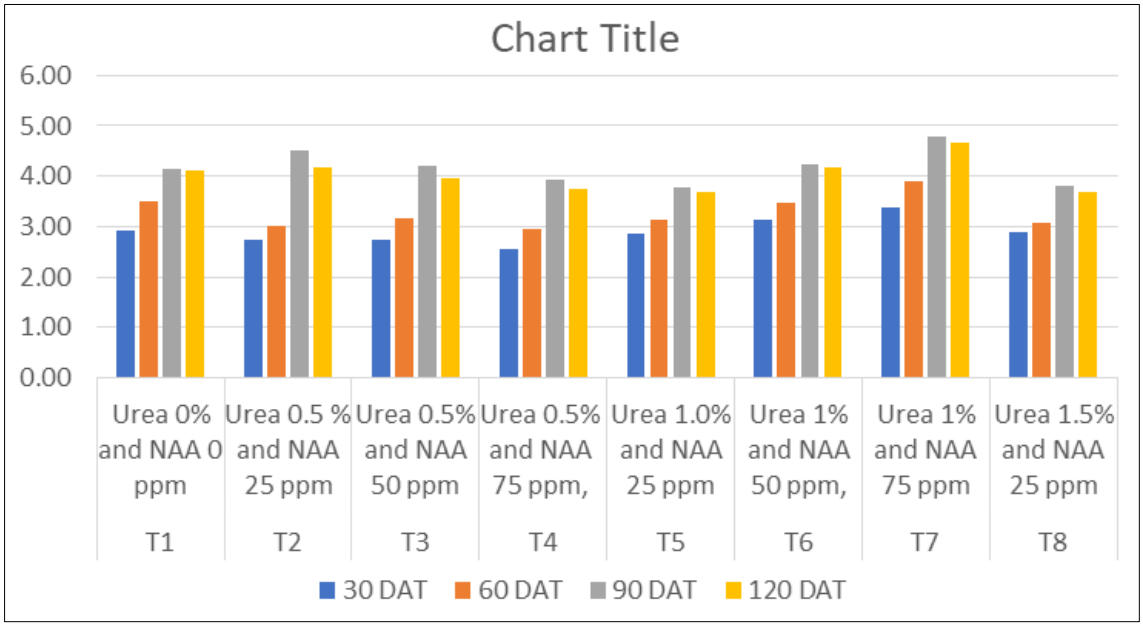

Fig 5: Effect of foliar application of urea and NAA on Leaf width

Shoot length

Total no shoot length, data were taken according to the 30 days of interval up to 120 days of harvesting period where treatment of Urea and NAA was applied plant was seen

maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 6.93 and the minimum was recorded as T4 (Urea 0.5% and NAA 50 ppm) was seems to be lowest resulting 6.14.

Table 6: Effect of foliar application of urea and NAA on Shoot length

Shoot length		
Treatment	**Treatments detail**	**Fruit breath(cm)**
T1	Urea 0% and NAA 0 ppm	6.47
T2	Urea 0.5 % and NAA 25 ppm	6.44
T3	Urea 0.5% and NAA 50 ppm	6.64
T4	Urea 0.5% and NAA 75 ppm,	6.14
T5	Urea 1.0% and NAA 25 ppm	6.49
T6	Urea 1% and NAA 50 ppm,	6.16
T7	Urea 1% and NAA 75 ppm	6.93
T8	Urea 1.5% and NAA 25 ppm	6.32
	CD	0.05
	SeM	0.013

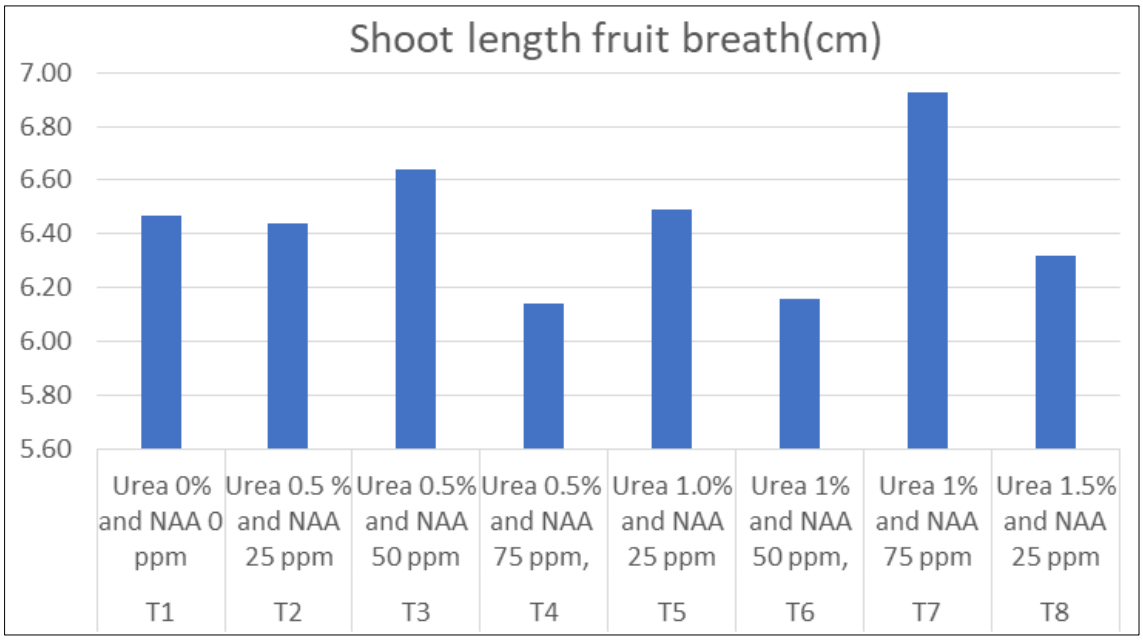

Fig 6: Effect of foliar application of urea and NAA on Shoot length

Fruit weight

The size of fruit weight, data were taken according to the 30 days up to 120 days of interval of harvesting period where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 3.810 and the minimum was recorded as T6 (Urea 1% and NAA 50 ppm) was seems to be lowest resulting 2.183.

Table 7: Effect of foliar application of urea and NAA on Fruit weight

Treatment	Treatments detail	Fruit weight
T1	Urea 0% and NAA 0 ppm	3.613
T2	Urea 0.5 % and NAA 25 ppm	2.747
T3	Urea 0.5% and NAA 50 ppm	2.790
T4	Urea 0.5% and NAA 75 ppm,	3.260
T5	Urea 1.0% and NAA 25 ppm	3.093
T6	Urea 1% and NAA 50 ppm,	2.183
T7	Urea 1% and NAA 75 ppm	3.810
T8	Urea 1.5% and NAA 25 ppm	2.517
	CD	0.404
	SeM	0.108

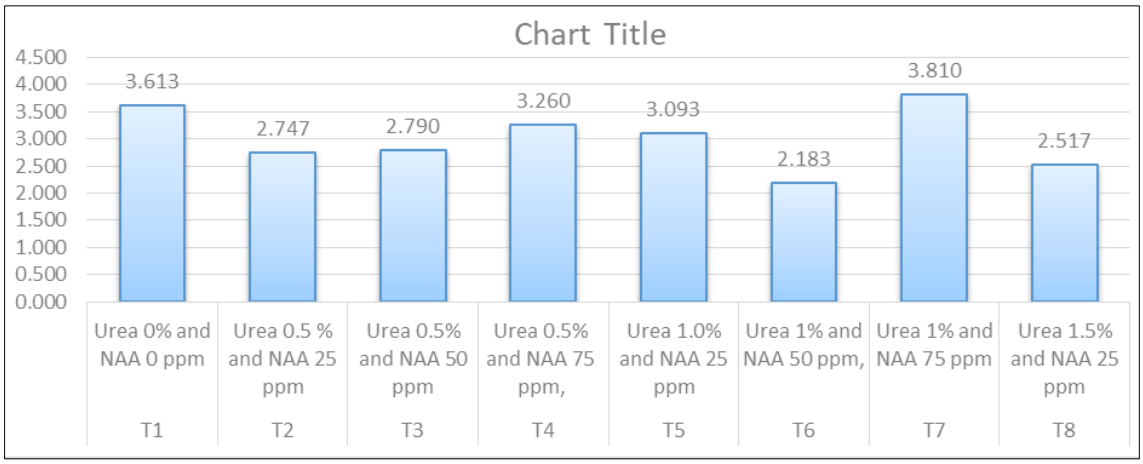

Fig 7: Effect of foliar application of urea and NAA on Fruit weight

Single fruit weight

Total no shoot length, data were taken according to the 30 days of interval up to 120 days of harvesting period where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1*%* and NAA 75ppm) highest was recorded 2.89 and the minimum was recorded as T8 (Urea 1.5*%* and NAA 25 ppm) was seems to be lowest resulting 2.00.

Table 8: Effect of foliar application of urea and NAA on Single fruit weight

Single fruit weight		
Treatment	**Treatments detail**	
T1	Urea 0*%* and NAA 0 ppm	2.01
T2	Urea 0.5 *%* and NAA 25 ppm	2.04
T3	Urea 0.5*%* and NAA 50 ppm	2.05
T4	Urea 0.5*%* and NAA 75 ppm,	2.45
T5	Urea 1.0*%* and NAA 25 ppm	2.41
T6	Urea 1*%* and NAA 50 ppm,	2.48
T7	Urea 1*%* and NAA 75 ppm	2.89
T8	Urea 1.5*%* and NAA 25 ppm	2.00
	CD	0.127
	SeM	0.034

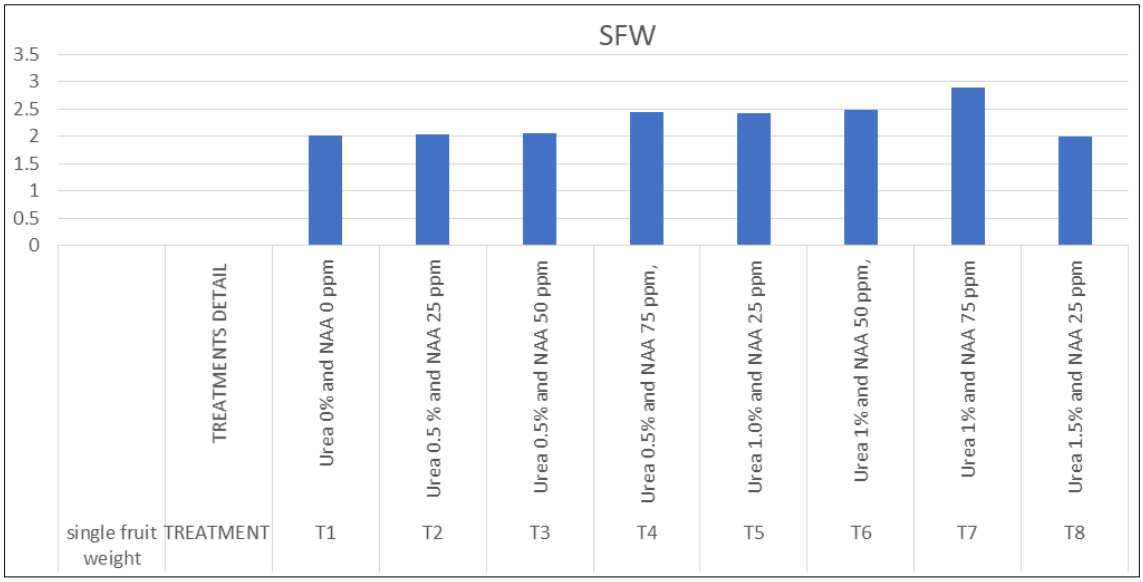

Fig 8: Effect of foliar application of urea and NAA on Single fruit weight

Fruit length

The total no of fruit length, data were taken according to the 30 days up to 120 days of interval of harvesting period where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1*%* and NAA 75ppm) highest was recorded 10.360 and the minimum was recorded as T3 (Urea 0.5*%* and NAA 50 ppm) was seems to be lowest resulting 27.493.

Table 9: Effect of foliar application of urea and NAA on Fruit length

Treatment	Treatments detail	Fruit length
T1	Urea 0% and NAA 0 ppm	7.597
T2	Urea 0.5 % and NAA 25 ppm	7.400
T3	Urea 0.5% and NAA 50 ppm	7.493
T4	Urea 0.5% and NAA 75 ppm,	5.483
T5	Urea 1.0% and NAA 25 ppm	7.543
T6	Urea 1% and NAA 50 ppm,	8.293
T7	Urea 1% and NAA 75 ppm	10.360
T8	Urea 1.5% and NAA 25 ppm	8.123
	CD	2.402
	SeM	0.642

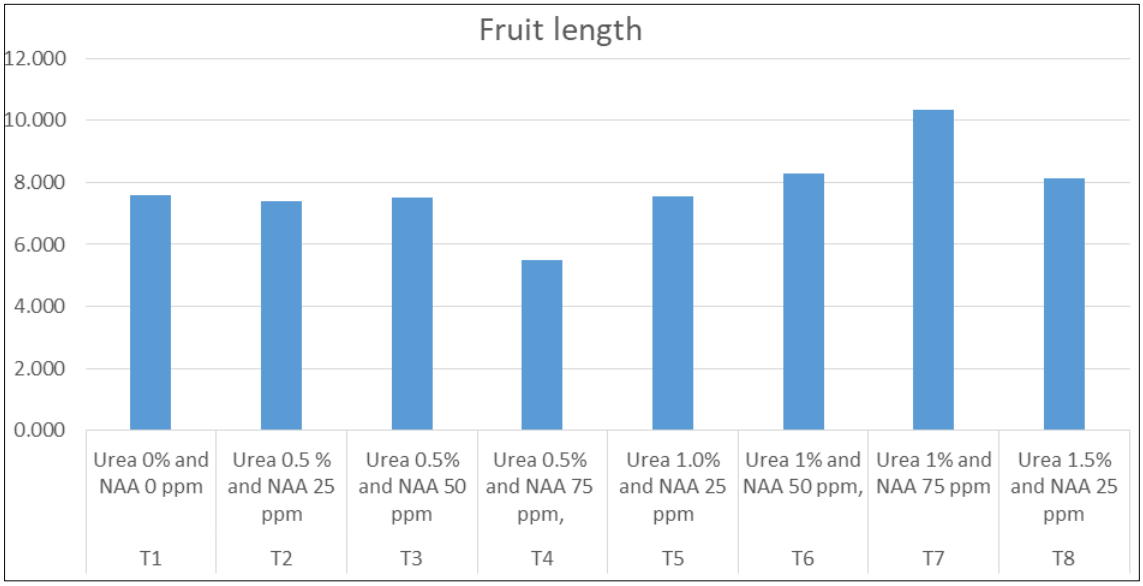

Fig 9: Effect of foliar application of urea and NAA on Fruit length

Number of fruit/plants

The total no of fruit counted from the period of production it seems that plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 34.970 and the minimum was recorded as T3 (Urea 0% and NAA 0ppm) where no application was applied was seems to be lowest resulting 27.977.

Table 10: Effect of foliar application of urea and NAA on No of Fruit

Treatment	Treatments detail	No of Fruits
T1	Urea 0% and NAA 0 ppm	28.350
T2	Urea 0.5 % and NAA 25 ppm	30.190
T3	Urea 0.5% and NAA 50 ppm	27.977
T4	Urea 0.5% and NAA 75 ppm,	29.440
T5	Urea 1.0% and NAA 25 ppm	33.433
T6	Urea 1% and NAA 50 ppm,	30.503
T7	Urea 1% and NAA 75 ppm	34.970
T8	Urea 1.5% and NAA 25 ppm	31.777
	CD	1.885
	SeM	0.504

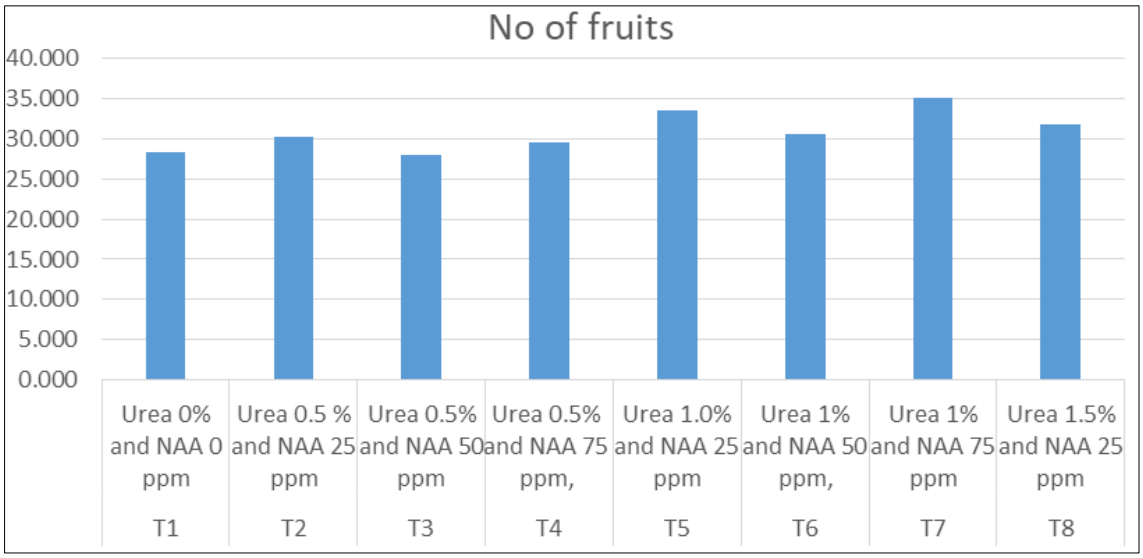

Fig 10: Effect of foliar application of urea and NAA on No of fruit

Fruit breath

Fruit breath was counted from the period of production it seems that plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 0.95 followed by T6 and the minimum was recorded as T1 (Urea 0% and NAA 0ppm) where no application was applied was seems to be lowest resulting 0.81. It seems that minimum was recoded in T4 and T8, where same result was observed.

Table 11: Effect of foliar application of urea and NAA on Fruit breath

Fruit breath		
Treatment	**Treatments Detail**	**Fruit breath (cm)**
T1	Urea 0% and NAA 0 ppm	0.81
T2	Urea 0.5 % and NAA 25 ppm	0.82
T3	Urea 0.5% and NAA 50 ppm	0.85
T4	Urea 0.5% and NAA 75 ppm,	0.81
T5	Urea 1.0% and NAA 25 ppm	0.87
T6	Urea 1% and NAA 50 ppm,	0.91
T7	Urea 1% and NAA 75 ppm	0.95
T8	Urea 1.5% and NAA 25 ppm	0.81
	CD	0.019
	SeM	0.005

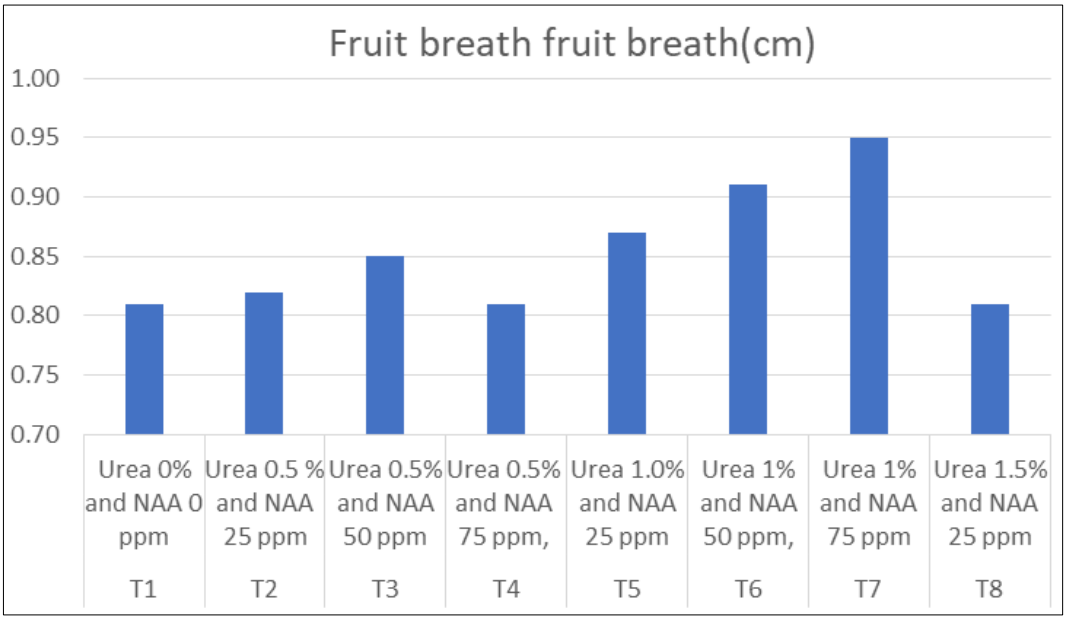

Fig 11: Effect of foliar application of urea and NAA on Fruit breath

Fruit Yield per plant

All data shows that fruit yield per plant were observed quite similar in every treatment, Thu the total yield, data where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 146.54 and the minimum was recorded as T4 (Urea 0.5% and NAA 50 ppm) was seems to be lowest resulting 122.55.

Table 12: Effect of foliar application of urea and NAA on Fruit yield per plant

Fruit yield per plant		
Treatment	**Treatments detail**	
T1	Urea 0% and NAA 0 ppm	134.30
T2	Urea 0.5 % and NAA 25 ppm	124.27
T3	Urea 0.5% and NAA 50 ppm	142.31
T4	Urea 0.5% and NAA 75 ppm,	122.55
T5	Urea 1.0% and NAA 25 ppm	136.39
T6	Urea 1% and NAA 50 ppm,	144.47
T7	Urea 1% and NAA 75 ppm	146.54
T8	Urea 1.5% and NAA 25 ppm	138.35
	CD	2.66
	SeM	0.71

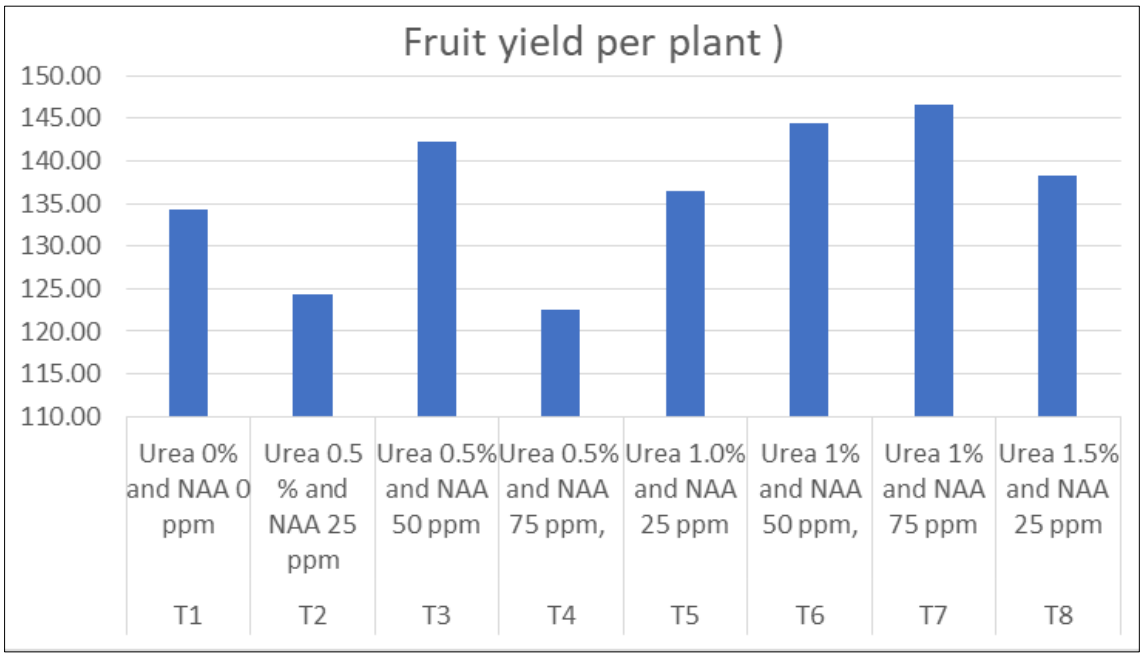

Fig 12: Effect of foliar application of urea and NAA on Fruit yield per plant

Yield per hectare (t/ha)

Over all data shows that yield were observed quiet similar in every treatment, Thu the total yield, data where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 34.970 and the minimum was recorded as T3 (Urea 0.5% and NAA 50 ppm) was seems to be lowest resulting 27.977.

Table 13: Effect of foliar application of urea and NAA on Yield

Treatment	Treatments detail	yield (t/ha)
T1	Urea 0% and NAA 0 ppm	28.350
T2	Urea 0.5 % and NAA 25 ppm	30.190
T3	Urea 0.5% and NAA 50 ppm	27.977
T4	Urea 0.5% and NAA 75 ppm,	29.440
T5	Urea 1.0% and NAA 25 ppm	33.433
T6	Urea 1% and NAA 50 ppm,	30.503
T7	Urea 1% and NAA 75 ppm	34.970
T8	Urea 1.5% and NAA 25 ppm	31.777
	CD	1.885
	SeM	0.504

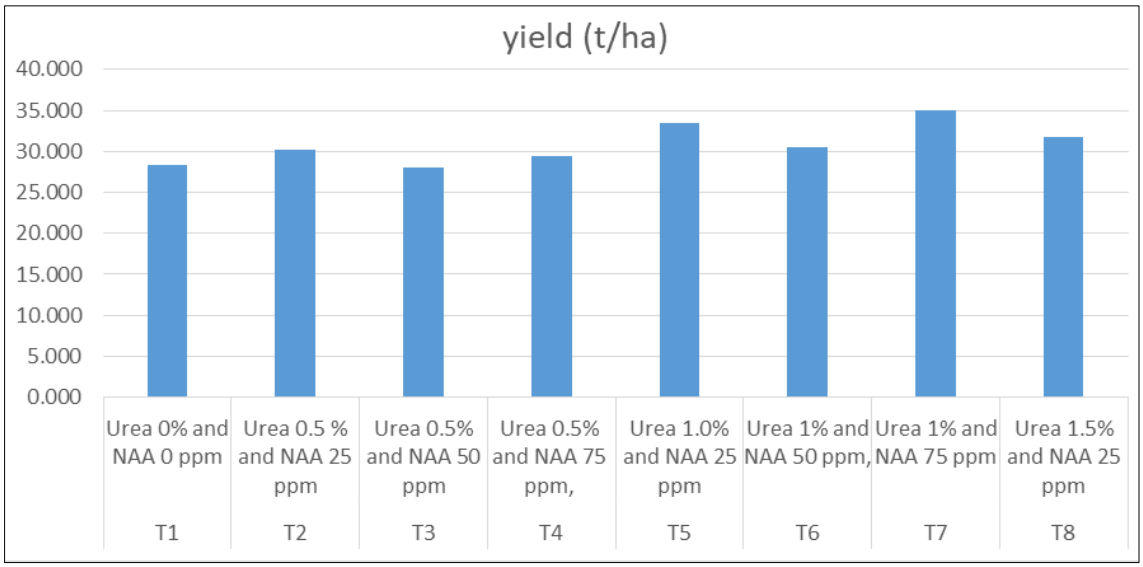

Fig 13: Effect of foliar application of urea and NAA on Yield

Germination percentage%

The total germination percentage were observed. It seems that every treatment result same percentage of germination, where treatment of Urea and NAA was applied plant was seen maximum on T7 (Urea 1% and NAA 75ppm) highest was recorded 76.72 and the minimum was recorded as T1 (Urea 0% and NAA 0 ppm) was seems to be lowest resulting 62.88

Table 14: Effect of foliar application of urea and NAA on Germination percentage

Germination %		
Treatment	**Treatments Detail**	
T1	Urea 0% and NAA 0 ppm	62.88
T2	Urea 0.5 % and NAA 25 ppm	68.49
T3	Urea 0.5% and NAA 50 ppm	66.18
T4	Urea 0.5% and NAA 75 ppm,	64.29
T5	Urea 1.0% and NAA 25 ppm	66.20
T6	Urea 1% and NAA 50 ppm,	72.59
T7	Urea 1% and NAA 75 ppm	76.72
T8	Urea 1.5% and NAA 25 ppm	66.55
	CD	0.406739
	SeM	0.108786

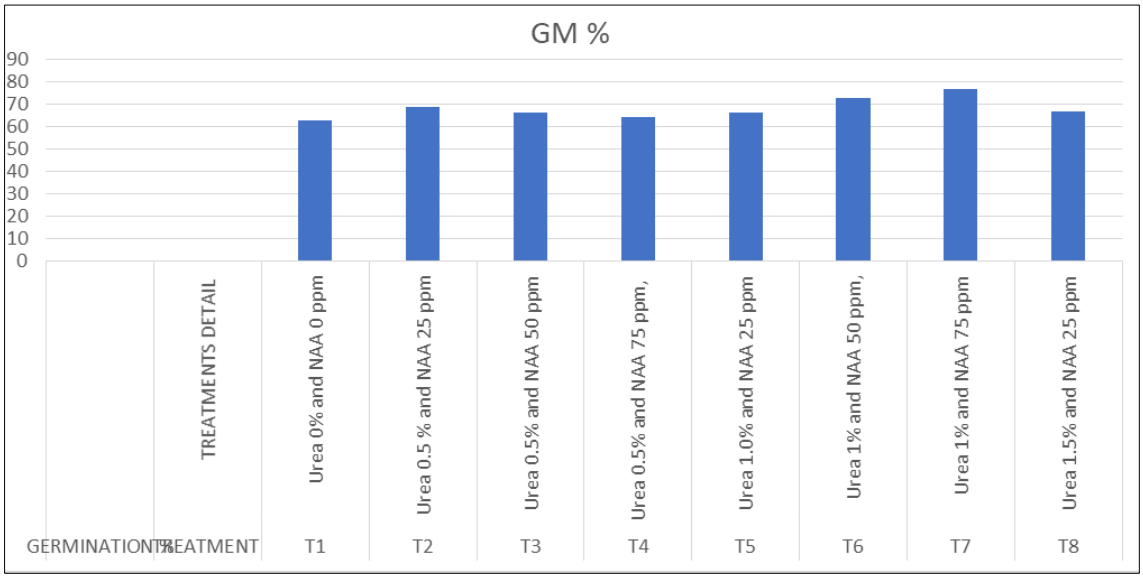

Fig 14: Effect of foliar application of urea and NAA on Germination percentage

Conclusion

The uses of Urea and NAA results in increased of growth and yield of chilly. The different concentration of Urea and NAA gives positive effect on flower and fruit set. Uses of T (Urea 1% and NAA 75 ppm) results best in all of the parameters for the variety of chilly in Kanpur area of India is growing the chilly with Urea and NAA combination. For the commercial cultivation of the chilly variety Pusha Jwala, the urea and NAA combination is more suitable.

References

1. Agarwal A, Gupta S, Ahmed Z. Influence of plant densities on productivity of bell pepper (*Capsicum annum*) under greenhouse in high altitude cold desert of Ladakh. Acta Hort. 2007;756:309-314.
2. Ahmed MK. Optimum plant spacing of sweet pepper in the Sudan Gezira Acta. Horticulture. 1984;143:305-310.
3. Andrews J. pepper the domesticated capsicums. University of Texas press, Austin, 1995, 186p.
4. Andrews J. The pepper trail*:* history and recipes from around the world. University of North Texas press, Denton, Texas. 1999, 261p.
5. Asian Vegetable Research and Development center (AVRDC). AVRDC adds pepper as new principle crop. AVRDC, center point. 1986;5(1):1.
6. Balaraj R. Investigations on seed technologies aspects in chilli (*Capsicum annum* L.) Ph.D. Thesis, Uni. Agri., Dharwad, 1999.
7. Bauja KL, Kaur G, Sooch BS, singh H, Varietal variation in capsicum content in Capsicum annum fruits. Vegetables science. 1978;5:23-29.
8. Bishwakarma BK. Response of chilli (capsicum annum L.) genotypes to the spray of triacontanol in spring summer of Midwestern Terai,Nepal. Thesis, M.Sc. Ag., Trivuwan university / IAAS,Rampur, Nepal, 2006.
9. Chadha KL. Hand book of horticulture information and publications of Agriculture of agriculture India Counicil of Agriculture Reserch Pusa. New Delhi, 2002, 382p.
10. Chattopadhyay TK, Sen SK. Studies on the effect of different growth regulators on reproductive, 2004.
11. Chaudhary AS, Singh RL. Effect of sapicing different concentration of Napthaelic acidic acid (NAA) on growth and yield of capsicum hybrid. Haryana J Hartic. Sci. 2007;35(1&2)*:*124-125.
12. Collingwood EF. Vegetable production under arid and Semi-arid condition in tropical Africa. Food and Agriculture Organization, Rome, 2002.
13. Dahal KC. Evaluation of heat tolerant chilli (*capsicum annum* L.) Genotypes during spring summer I western Terai of Nepal. Thesis, M,Sc. Ag, Tribhuwan university/ IAAS, Rampur, Nepal, 2005, 84p.
14. Das PC. vegetable crops of India, Kalyani Publishing, New Delhi, 1997, 101p.
15. Dasgan YH, Abak K. Effect of planting density and number of shoots on yield and fruit characteristics of pepper grown in glass house. Turk J Agric. For, 2003;27:29-35.
16. Decoteau DR, Graham HHH. Plant spatial arrangement affects growth, yield and pod distribution of cayenne pepper Hort Sci. 2006;29(3):149-157.
17. FAO. FAO year book 2000. Food and agriculture organization of United Nations, Rome. 2000;5:150-151.
18. Locassio SJF, Kell GA, Martin FG. Response of pepper to NAA source. J Am Soc. 2001;106:625-632.
19. Locassio SJ, Stall WM. Plant arrangement for increased pepper yield. Proc. Fla. State Hort. Soc. 1994;95:333-335.
20. Magdatena VC. NAA rate effects of the growth and yield of pepper plants. J soil Sci. 2003;67:1781-1789.
21. Mavengahama S, Ogunlela VB, mariga DIK. Response of paprika (*Capsicum annum* L.) to different concentration of Naphthalene Acetic Acid. Afr Crop Sci Conf Proc. 2003;6:9-13.
22. Nath P. Vegetables for the tropical region. India Council of Agriculure Research, New Delhi, 2006, 223p.
23. Neginahal BP, Revanappa Patil MG, Halepyati AS, Bheemanna M. Effect of planting method of plant growth hormones productivity of chilli. J Agri., Sc. 2009.
24. Pun L, Karmacharya BB. Trainer's manual vegetable Agriculture Manpower development and training programme. Kathmandu Nepal, 2005, 174-178.
25. Purseglove JW. tropical crops Dicotyledons. ELBS. Longman, London, 2001;1-2:135-36.
26. Purthi JS. Spice and condiments, National Book Trust. New Delhi, 2001, 40-49.