"Response of Guava (*Psidium guajava* L.) to Pruning Intensities and Foliar Application of Nutrients on Growth Attributes"

Abstract

The experiment was conducted on nine year old well-established guava orchard planted at 3.0 × 3.0 m spacing to study the response of foliar feeding of nutrients and pruning intensities on the growth attributes of guava (*Psidium guajava* L.) cv. Allahabad Safeda during 2022-23 and 2023-24 at Horticultural orchard at Powarkheda, Narmadapuram under the Department of Horticulture, College of Agriculture, JNKVV Jabalpur (M.P.). The experiment was laid out in Factorial Randomized Block Design (FRBD) with three replications. The treatment consist of two factor (A) three levels of pruning, i.e. No pruning (P_0), pruning of 25cm shoot from tip (P_1), pruning of 50cm shoot from tip (P_2) and factor (B) thirteen levels of nutrients N_o- Control, N_1-Urea @ 2%, N_2- Urea @ 3%, N_3-Nano urea @ 0.2% N_4- Nano urea @0.3%,N_5 –Zinc @ 0.4%,N_6- Zinc @ 0.6%,N_7- Nano zinc @ 0.04%, N_8-Nano zinc @ 0.06%, N_9- Iron @ 0.3%,N_{10}-Iron @ 0.5%,N_{11}-Nano iron @ 0.03%,N_{12}-Nano iron @0.5%. The results revealed that the maximum increase in - plant height (11.85%), plant spread N-S (12.77%), plant spread E-W (13.76%), length of new sprout (16.87cm) & (30.85cm) and diameter of new sprout (2.57mm) & (3.47mm) at 60 and 90 days after pruning (DAP) respectively were recorded in P_2 (pruning of 50cm shoot from tip). While, minimum was observed under treatment N_0 (no pruning). With respect to foliar application of nutrients, the maximumincrease in plant height (11.13%), plant spread N-S (12.23%), plant spread E-W (13.33%), length of new sprout (16.18cm) & (30.16cm) and diameter of new sprout (2.53mm) & (3.45mm) at 60 and 90 DAP respectively were recorded in N_2 (Urea @3%) and minimum was found in N_0 (control). Among, the treatment combinations, P_2N_2 (pruning of 50cm shoot from tip + Urea @ 3%)was found most superior with respect to the maximum, increase in plant height (12.50%), plant spread N-S (13.40%), plant spread E-W (14.83%), length of new sprout (17.68cm) & (31.65cm) and diameter of new sprout (2.71mm) & (3.61mm) at 60 and 90 DAP respectively.

Keywords: nutrients, pruning intensity, guava, shoot and growth parameter.

Introduction: - Guava (*Psidium guajava* L.) also known as "Apple of the Tropics" or "Poor Man's Apple" belongs to family myrtaceae and is one of the most popular fruit grown in tropical and subtropical regions of India. It is the fourth most important fruit crop in area and production after mango, banana and citrus. According to Magadum et al [1]guava bears on current season's growth and flowers appear in the axils of new leaves and so it responds well to pruning. Pruning is usually practiced in the summer (April – May) before flower initiation. Boyar and Ramdevputra [2] stated that in eastern and southern India, the guava tree flowers thrice in a year, i.e. February-March, June-July and October. The respective bahars, are called "Ambe", "Mrig" and "Hasta" bahar. Among all of these three bahars "Mrig bahar" fruits mature during winter i.e. November-January, which are better in quality, taste and higher vitamin 'C' content .

According to Singh etal. [3] guava is a resilient and productive fruit crop that can be cultivated in various soil types and Agro-climatic conditions, making it highly profitable. Guava is a type of crop that is highly responsive to pruning. It produces fruit on the new growth of the current season, making it particularly well-suited for pruning. Pruning is typically carried out throughout the summer months, specifically in April and May, prior to the commencement of flowering. Pruning guava is a crucial activity that significantly impacts the vitality, productivity and quality of the fruit.

The foliar feeding of fruit tree has gained much importance in recent years, as nutrients applied through soil are needed in higher quantity because some amount leaches down and some become unavailable to the plant due to complex soil reactions, also increases soil and water pollutions. Foliar feeding of nutrients is advantageous in terms of low application rate, uniform distribution of fertilizer material and quick response to applied nutrients as stated by Kumar el al[4]. and Dongre et al [5]. Nutrients like nitrogen, phosphors and potash play a vital role in promoting the plant vigour and productivity, whereas micronutrients like zinc and iron perform a specific role in the growth and development of plant, quality produce and uptake of major nutrients as stated by Yadav et al [6] and Zagade et al [7].Considering all the above facts and with a view to have better growth, a field experiment was carried out with the objective to study the effect of pruning intensities and foliar application of nutrients on growth parameter of guava (*Psidium guajava* L.).

Material and Methods

The experiment was conducted on nine year old well-established guava orchard planted at 3.0 × 3.0 m spacing to study the response of foliar feeding of nutrients and pruning intensities on the growth parameters of guava (*Psidium guajava* L.) cv. Allahabad Safeda during 2022-23 and 2023-24 at Horticultural orchard, Powarkheda,Narmadapuram under the Department of Horticulture, College of Agriculture, JNKVV Jabalpur (M.P.). The experiment was laid out in Factorial Randomized Block Design (FRBD) with three replications. The experiment consists two factor (A) i.e. No pruning (P_0), pruning of 25cm shoot from tip (P_1), pruning of 50cm shoot from tip (P_2) and factor (B)- N_o- Control, N_1-Urea @ 2%, N_2- Urea @ 3%, N_3-Nano urea @ 0.2% N_4- Nano urea @0.3%,N_5 –Zinc @ 0.4%,N_6- Zinc @ 0.6%,N_7- Nano zinc @ 0.04%,N_8-Nano zinc @ 0.06%, N_9- Iron @ 0.3%,N_{10}-Iron @ 0.5%,N_{11}-Nano iron @ 0.03%,N_{12}-Nano iron @0.5%. The pruning was done on 27th of April and nutrients was applied in each treatment on before flowering and after fruit set in guava plant .The increase in plant height was measured by measuring tape from base to the tip of plant. The plant canopy spread (E-W and N-S) were measured with the help of measuring tape.After pruning, ten shoots that severely pruned was randomly marked in four directions on the tree. After 60 days, the number of new sprout that appeared on each pruned branch was recorded. The length of new sprout was measured from the site of emergence to its apex at 60, and 90 days after pruning with the help of measuring scale. The diameter of new sprout was measured from the site of emergence at the 60 and 90 days after pruning with the help of digital vernier caliper.

Results and Discussion

Percent increase in plant height -

Data regarding increase in plant height as influence by pruning intensity and nutrients and their combination presented in Table-1 and depicted in Figure-1 revealed that plant height was significantly increased during both of the years. Among, the different level of pruning, maximumincrease in plant height (11.85%) was recorded in P_2 (pruning of 50cm shoot from tip) and minimum increase in plant height (8.73%) was observed in P_0 (no pruning). It might be due to well response of vegetative growth to pruning and narrow C: N ratio of plant that induces vegetative flush in tree for vigorous growth of plant. The results are in accordance with the findings of Jadhav et al [8] and Magadum et al [1] in guava. With respect to foliar feeding of

nutrients the maximum, increase in plant height (11.13%) was recorded in N_2 (Urea @ 3%) and minimumincrease in plant height (9.78%) was found in N_0 (control). The effect of nitrogen in increasing the tree growth might be due to the fact that absorbed nitrogen combined with carbohydrates synthesis leads to the formation of nitrogenous compound such as protein, protoplasm, chlorophyll, nucleic acids, nucleotides, enzymes and co-enzymes to build up new tissues as reported by Rathore and Chandra, [9] and Yadav et al[10] in acid lime. Among, the treatment combinations, significantly highest, increase in plant height (12.50%) was observed in P_2N_2 (pruning of 50cm shoot from tip + Urea @ 3%) followed byP_2N_1 (pruning of 50cm shoot from tip + Urea @ 2%) with respect to increase in plant height (12.42%) and lowest, increase in plant height (8.05%) was observed in P_0N_0 (no pruning + control).

Table: 1. Effect of pruning intensity and foliar feeding of nutrients on increase plant height (%).

Nutrients Factor B	**Pruning factor A**											
	Year 2022-23				**Year 2023-24**				**Pooled**			
	P_0 (0 cm)	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**	**P_0 (0 cm)**	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**	**P_0 (0 cm)**	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**
N_0 (Control)	8.01	10.08	11.05	9.71	8.09	10.20	11.24	9.84	8.05	10.14	11.14	**9.78**
N_1 (2% Urea)	9.28	11.26	12.32	10.96	9.40	11.42	12.53	11.12	9.34	11.34	12.42	**11.04**
N_2 (3% Urea)	9.38	11.36	12.41	11.05	9.51	11.51	12.59	11.20	9.44	11.44	12.50	**11.13**
N_3 (0.2% Nano urea)	9.09	11.06	12.09	10.75	9.20	11.24	12.28	10.90	9.14	11.15	12.19	**10.83**
N_4 (0.3% Nano urea)	9.17	11.16	12.19	10.84	9.28	11.33	12.38	11.00	9.22	11.25	12.28	**10.92**
N_5(0.4% Zinc)	8.72	10.86	11.83	10.47	8.81	10.98	12.02	10.60	8.77	10.92	11.92	**10.54**
N_6 (0.6% Zinc)	8.83	10.92	11.96	10.57	8.91	11.06	12.15	10.71	8.87	10.99	12.06	**10.64**
N_7(0.04% Nano zinc)	8.51	10.70	11.64	10.28	8.63	10.85	11.84	10.44	8.57	10.77	11.74	**10.36**
N_8 (0.06% Nano zinc)	8.62	10.78	11.75	10.38	8.75	10.93	11.95	10.54	8.68	10.86	11.85	**10.46**
N_9 (0.3% Iron)	8.35	10.50	11.44	10.10	8.45	10.66	11.63	10.25	8.40	10.58	11.54	**10.17**
N_{10} (0.5%Iron)	8.44	10.61	11.56	10.21	8.54	10.76	11.75	10.35	8.49	10.69	11.65	**10.28**
N_{11}(0.03% Nano Iron)	8.16	10.18	11.21	9.85	8.25	10.33	11.40	9.99	8.21	10.26	11.31	**9.92**
N_{12} (0.05% Nano Iron)	8.24	10.28	11.30	9.94	8.35	10.42	11.49	10.09	8.30	10.35	11.40	**10.01**
Mean	8.68	10.75	11.75		8.78	10.90	11.94		**8.73**	**10.83**	**11.85**	
	Pruning	**Nutrient**	**Interaction**		**Pruning**	**Nutrient**	**Interaction**		**Pruning**	**Nutrient**	**Interaction**	
SEm(±)	1.567	0.429	0.042		1.611	0.435	0.042		0.005	0.010	0.018	
CD at 5%	4.480	1.225	0.120		4.603	1.242	0.120		0.014	0.029	0.050	

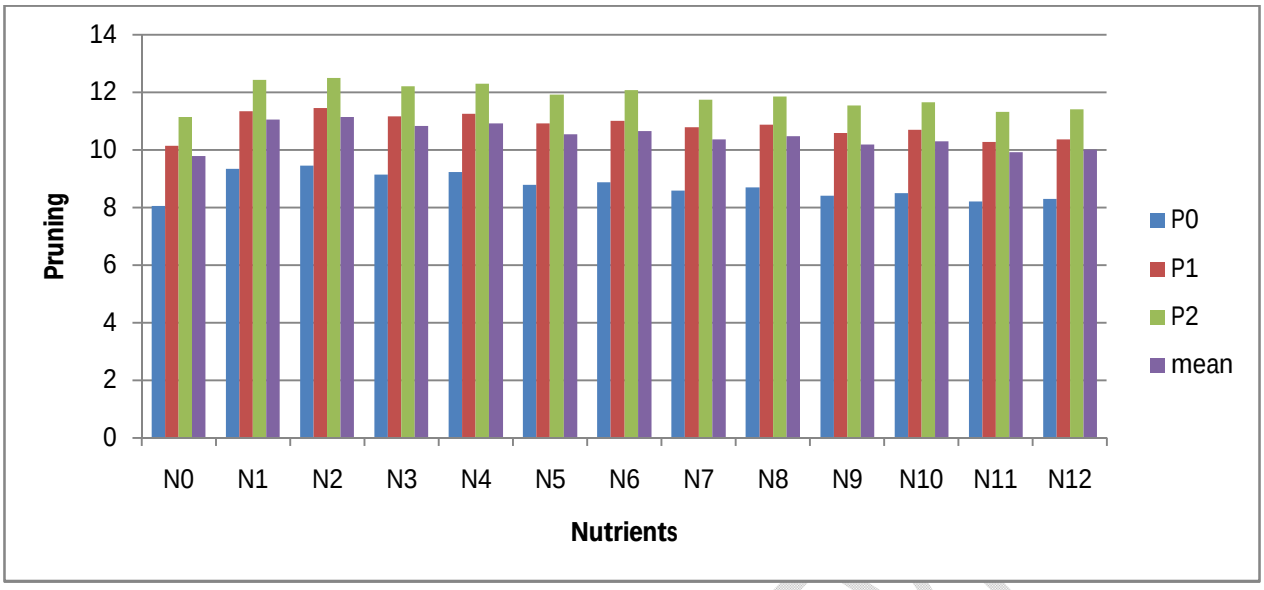

Fig: 1. Effect of pruning intensity and foliar feeding of nutrients on increase plant height (%).

Percent increase plant spread North-South and East-West

The data pertaining to increase in plant spread N-S & E-W as influence by pruning intensity and foliar feeding of nutrients and their combination is presented in Table- 2-3 and depicted in Figure-2-3. The data revealed that plant spread N-S & E-W was significantly increased during both of the years of investigation. Among, different level of pruning, maximum increase in plant spread N-S (12.77%) & E-W (13.76%) were recorded in P_2 (pruning of 50cm shoot from tip) and minimum increase in plant spread N-S (9.80%) & E-W (10.75%) were observed in P_0 (no pruning). With respect to foliar feeding of nutrients the maximum, increase in plant spread N-S (12.23%) & E-W (13.33%) were recorded in N_2 (Urea @ 3%) and minimum increase in plant spread N-S (10.63%) & E-W (11.80%) were found in N_0 (control). Among, the treatment combinations, significantly highest, increase in plant spread N-S (13.40%) & E-W (14.83%) was observed in P_2N_2 (pruning of 50cm shoot from tip + Urea @ 3%) followed byP_2N_1 (pruning at 50cm shoot from tip + Urea @ 2%) with respect to increase in plant spread N-S (13.30%) & E-W (14.76%) and minimum increase in plant spread N-S (9.06%) & E-W (10.11%) were observed in P_0N_0 (no pruning + control) . The results are in agreement with the earlier findings ofParmar et al [11], Kumar et al [12] in guava.

Table: 2. Effect of pruning intensity and foliar feeding of nutrients on increase plant spread North-South (%).

Nutrients Factor B	Pruning factor A											
	Year 2022-23				Year 2023-24				Pooled			
	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	9.04	11.08	11.11	10.41	9.09	11.21	12.25	10.85	**9.06**	11.14	11.68	**10.63**
N_1 (2% Urea)	10.48	12.42	13.18	12.03	10.58	12.61	13.41	12.20	10.53	12.52	13.30	**12.11**
N_2 (3% Urea)	10.59	12.58	13.28	12.15	10.68	12.77	13.51	12.32	10.63	12.67	**13.40**	**12.23**
N_3 (0.2% Nano urea)	10.23	12.16	13.02	11.80	10.33	12.32	13.23	11.96	10.28	12.24	13.12	**11.88**
N_4 (0.3% Nano urea)	10.34	12.24	13.12	11.90	10.45	12.40	13.33	12.06	10.39	12.32	13.23	**11.98**
N_5(0.4% Zinc)	9.73	11.68	12.86	11.43	9.84	11.84	13.06	11.58	9.79	11.76	12.96	**11.50**
N_6 (0.6% Zinc)	9.82	11.79	12.94	11.52	9.92	11.95	13.16	11.67	9.87	11.87	13.05	**11.60**
N_7(0.04% Nano zinc)	9.57	11.46	12.63	11.22	9.68	11.61	12.82	11.37	9.62	11.53	12.73	**11.29**
N_8 (0.06% Nano zinc)	9.68	11.55	12.76	11.33	9.77	11.70	12.95	11.47	9.72	11.62	12.85	**11.40**
N_9 (0.3% Iron)	9.47	11.30	12.36	11.05	9.57	11.44	12.55	11.19	9.52	11.37	12.46	**11.12**
N_{10} (0.5%Iron)	9.37	11.39	12.46	11.07	9.49	11.53	12.68	11.23	9.43	11.46	12.57	**11.15**
N_{11}(0.03% Nano Iron)	9.20	11.15	12.20	10.85	9.32	11.31	12.40	11.01	9.26	11.23	12.30	**10.93**
N_{12} (0.05% Nano Iron)	9.28	11.23	12.29	10.93	9.38	11.37	12.50	11.08	9.33	11.30	12.40	**11.01**
Mean	9.75	11.66	12.63		9.85	11.82	12.91		**9.80**	**11.74**	**12.77**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	1.468	0.511	0.177		1.553	0.477	0.096		0.005	0.010	0.017	
CD at 5%	4.197	1.460	0.506		4.439	1.364	0.274		0.013	0.027	0.047	

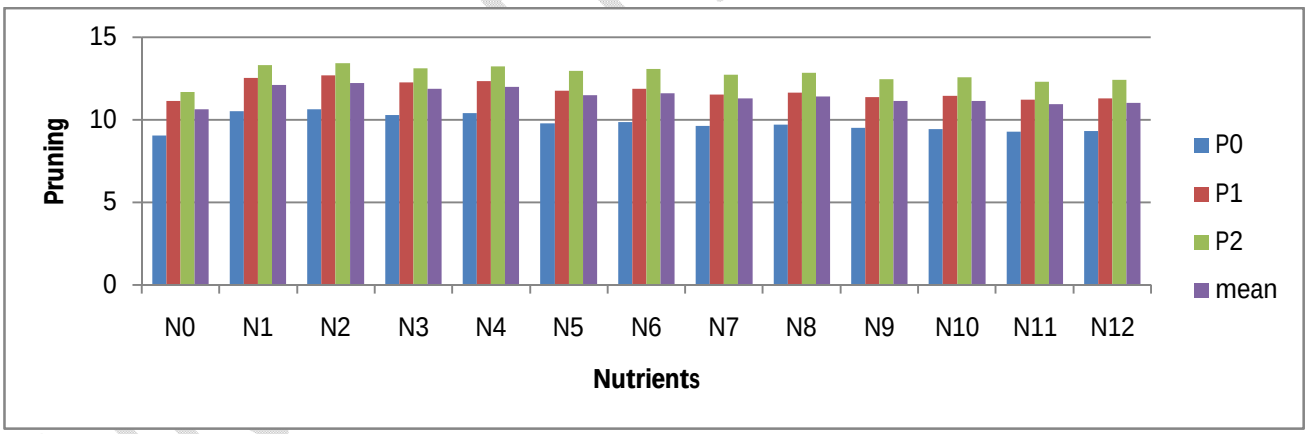

Fig: 2. Effect of pruning intensity and foliar feeding of nutrients on increase plant spread North-South (%).

Table: 3. Effect of pruning intensity and foliar feeding of nutrients on increase plant spread East-West (%).

Nutrients Factor B	Pruning factor A		
	Year 2022-23	Year 2023-24	Pooled

	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	10.06	12.07	13.04	11.73	10.16	12.24	13.24	11.88	**10.11**	12.16	13.14	**11.80**
N_1 (2% Urea)	11.28	13.49	14.68	13.15	11.38	13.69	14.83	13.30	11.33	13.59	14.76	**13.22**
N_2 (3% Urea)	11.37	13.64	14.72	13.24	11.49	13.82	14.93	13.41	11.43	13.73	**14.83**	**13.33**
N_3 (0.2% Nano urea)	11.08	13.23	14.07	12.79	11.17	13.41	14.29	12.96	11.12	13.32	14.18	**12.87**
N_4 (0.3% Nano urea)	11.14	13.30	14.15	12.86	11.27	13.56	14.41	13.08	11.21	13.43	14.28	**12.97**
N_5(0.4% Zinc)	10.76	12.82	13.64	12.40	10.88	13.03	13.73	12.55	10.82	12.92	13.69	**12.48**
N_6 (0.6% Zinc)	10.85	12.93	13.65	12.48	10.94	13.14	13.81	12.63	10.89	13.03	13.73	**12.55**
N_7(0.04% Nano zinc)	10.58	12.66	13.41	12.22	10.69	12.84	13.62	12.38	10.64	12.75	13.52	**12.30**
N_8 (0.06% Nano zinc)	10.69	12.74	13.49	12.31	10.80	12.91	13.69	12.47	10.75	12.83	13.59	**12.39**
N_9 (0.3% Iron)	10.38	12.45	13.22	12.02	10.51	12.63	13.42	12.19	10.45	12.54	13.32	**12.10**
N_{10} (0.5%Iron)	10.50	12.55	13.33	12.13	10.59	12.73	13.52	12.28	10.54	12.64	13.43	**12.20**
N_{11}(0.03% Nano Iron)	10.15	12.25	13.12	11.84	10.30	12.45	13.33	12.03	10.22	12.35	13.23	**11.93**
N_{12} (0.05% Nano Iron)	10.20	12.36	13.16	11.91	10.32	12.54	13.36	12.07	10.26	12.45	13.26	**11.99**
Mean	10.69	12.81	13.67		10.81	13.00	13.86		**10.75**	**12.90**	**13.76**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	1.530	0.493	0.102		1.574	0.495	0.106		0.008	0.016	0.028	
CD at 5%	4.374	1.408	0.290		4.500	1.415	0.303		0.022	0.045	0.078	

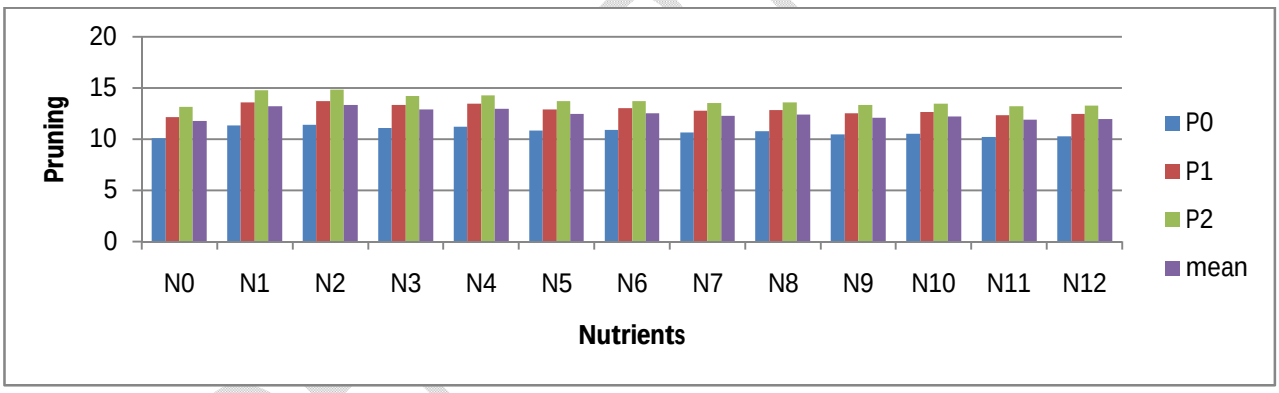

Fig: 3. Effect of pruning intensity and foliar feeding of nutrients on increase plant spread East-West (%).

Number of new sprout per pruned branch

Data subjected to number of new sprout per pruned branchas influence by pruning and foliar feeding of nutrients and their combination in presented in (Table- 4 and depicted in Figure-4).The data revealed that the number of new sprout per pruned branch was significantly increased during both year of investigation 2022-23 and 2023-2024. Among, the different level of pruning, maximum number of new sprout per pruned branch(5.51) was recorded in P_1 (pruning of 25cm shoot from tip) and minimum number of new sprout per pruned branch(3.47) was observed in P_0 (no pruning). 50 cm pruning from tip recorded less number of new shoots as compare to 25 cm pruning. The number of new sprouts per pruned shoots was reduced with

increase in the severity of pruning in Phalsa as reported by Naram Naidu [13]. It might be due to less number of vegetative bud left on the sever pruned shoots in guava as reported by Lakpathi et al [14]. With respect to foliar application of nutrients the maximum number of new sprout per pruned branch(4.89) was recorded in N_2 (Urea @ 3%) and minimum number of new sprout per pruned branch(4.06) was found in N_0 (control). Among, the treatment combination of pruning intensity and nutrients were found to be significant with the highest number of new sprout per pruned branch (5.93) in P_1N_2 (pruning of 25cm shoot from tip + Urea @ 3%) followed byP_1N_1 (pruning of 25cm shoot from tip + Urea @ 2%) with respect to number of new sprout per pruned branch(5.87). The minimum number of new sprout per pruned branch(3.03) was observed in P_0N_0 (no pruning + control). The results are in agreement with the earlier findings of Shinde et al [15].

Table: 4. Effect of pruning intensity and foliar feeding of nutrients on number of new sprout per pruned branch.

Nutrients Factor B	**Pruning factor A**											
	Year 2022-23				**Year 2023-24**				**Pooled**			
	P_0 (0 cm)	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**	**P_0 (0 cm)**	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**	**P_0 (0 cm)**	**P_1 (25 cm)**	**P_2 (50 cm)**	**Mean**
N_0 (Control)	3.01	5.05	4.02	4.03	3.05	5.12	4.08	4.08	**3.03**	5.09	4.05	**4.06**
N_1 (2% Urea)	3.82	5.82	4.73	4.79	3.89	5.92	4.81	4.87	3.86	5.87	4.77	**4.83**
N_2 (3% Urea)	3.87	5.88	4.80	4.85	3.94	5.98	4.88	4.93	3.91	**5.93**	4.84	**4.89**
N_3 (0.2% Nano urea)	3.71	5.72	4.58	4.67	3.78	5.82	4.66	4.75	3.75	5.77	4.62	**4.71**
N_4 (0.3% Nano urea)	3.77	5.77	4.66	4.73	3.84	5.87	4.74	4.82	3.81	5.82	4.70	**4.78**
N_5(0.4% Zinc)	3.55	5.56	4.46	4.52	3.61	5.65	4.53	4.60	3.58	5.61	4.50	**4.56**
N_6 (0.6% Zinc)	3.63	5.65	4.51	4.60	3.69	5.74	4.58	4.67	3.66	5.70	4.55	**4.63**
N_7(0.04% Nano zinc)	3.32	5.38	4.29	4.33	3.38	5.47	4.36	4.40	3.35	5.43	4.33	**4.37**
N_8 (0.06% Nano zinc)	3.44	5.47	4.36	4.42	3.50	5.56	4.43	4.50	3.47	5.52	4.40	**4.46**
N_9 (0.3% Iron)	3.17	5.25	4.15	4.19	3.22	5.33	4.21	4.25	3.20	5.29	4.18	**4.22**
N_{10} (0.5%Iron)	3.24	5.31	4.22	4.26	3.29	5.39	4.28	4.32	3.27	5.35	4.25	**4.29**
N_{11}(0.03% Nano Iron)	3.05	5.09	4.06	4.07	3.10	5.17	4.12	4.13	3.08	5.13	4.09	**4.10**
N_{12} (0.05% Nano Iron)	3.11	5.16	4.10	4.12	3.16	5.24	4.16	4.19	3.14	5.20	4.13	**4.16**
Mean	3.44	5.47	4.38		3.50	5.56	4.45		**3.47**	**5.51**	**4.41**	
	Pruning	**Nutrient**	**Interaction**		**Pruning**	**Nutrient**	**Interaction**		**Pruning**	**Nutrient**	**Interaction**	
SEm(±)	1.017	0.286	0.027		1.032	0.295	0.028		0.002	0.005	0.008	
CD at 5%	2.907	0.816	0.077		2.950	0.842	0.079		0.006	0.014	0.024	

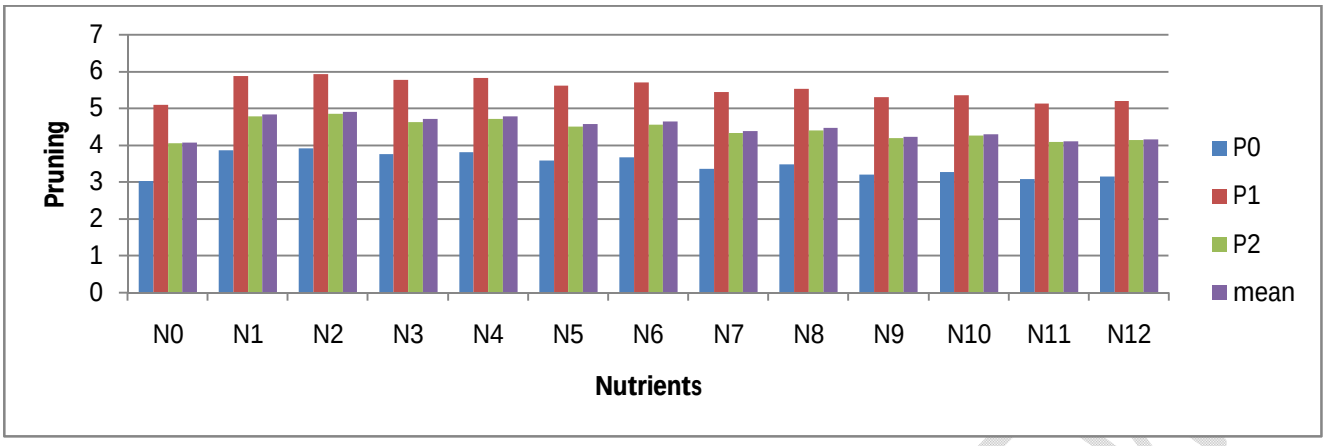

Fig: 4. Effect of pruning intensity and foliar feeding of nutrients on number of new sprout per pruned branch.

Length and diameter of new sprout (cm) at 60 and 90 DAP.

Data regarding length and diameter of new sprouts at 60 and 90 days after pruning (DAP) as influence by pruning intensity and foliar feeding of nutrients and their combination in presented in (Table - 5 to 8 and Figure -5 to 8).The data revealed thatlength & diameter of new sprout at 60 and 90 days after pruning (DAP) was significantly increased during both years of experimentation. Among, different level of pruning, maximum length of new sprout (16.87cm) and (30.85cm) & diameter of new sprout (2.57mm) and (3.47mm) were recorded in P_2 (pruning of 50cm shoot from tip) at 60 and 90 DAP respectively. The minimum length of new sprout (13.87cm) and (27.85cm) & diameter of new sprout (2.22mm) and (3.16mm) at 60 and 90 DAP respectively were observed in P_0 (no pruning). The increase in shoot length might be attributed to the less number of shoots and more food reserves available to individual shoots, which were left after pruning as reported that Lakpathi et al. [14] .With respect to foliar feeding of nutrients the maximum length of new sprout (16.18cm) and (30.16cm) & diameter of new sprout (2.53mm) and (3.45mm) were recorded in N_2 (Urea @ 3%) at 60 and 90 DAP respectively.The minimum length of new sprout (14.82cm) and (28.81cm) & diameter of new sprout (2.27mm) and (3.17mm) at 60 and 90 DAP respectively were found in N_0 (control). Among, the treatment combination, highest length of new sprout (17.68cm) and (31.65cm) & diameter of new sprout (2.71mm) and (3.61mm) at 60 and 90 DAP respectively were observed in P_2N_2 (pruning at 50cm shoot from tip + Urea @ 3%) followed by P_2N_1 (pruning at 50cm shoot from tip + Urea @ 2%)

with respect to length of new sprout (17.57cm) and (31.54cm) & diameter of new sprout (2.69mm) and (3.59mm) at 60 and 90 DAP respectively .The minimum length of new sprout (13.18cm) and (27.18cm) & diameter of new sprout (2.08mm) and (3.02mm) at 60 and 90 DAP respectively were observed in P_0N_0 (no pruning + control). These results are in accordance with findings reported by Raut Shrirudda, [16] and Singhet al[3] in guava.

Table: 5. Effect of pruning intensity and foliar feeding of nutrients on length of new sprout (cm) at 60 DAP.

Nutrients Factor B	Pruning factor A											
	Year 2022-23				Year 2023-24				Pooled			
	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	13.10	15.05	16.07	14.74	13.25	15.20	16.26	14.90	13.18	15.13	16.17	**14.82**
N_1 (2% Urea)	14.27	16.27	17.47	16.00	14.36	16.41	17.66	16.14	14.32	16.34	17.57	**16.07**
N_2 (3% Urea)	14.38	16.36	17.58	16.11	14.47	16.50	17.77	16.25	14.42	16.43	17.68	**16.18**
N_3 (0.2% Nano urea)	14.07	16.06	17.29	15.81	14.16	16.20	17.48	15.95	14.12	16.13	17.39	**15.88**
N_4 (0.3% Nano urea)	14.16	16.16	17.38	15.90	14.25	16.30	17.57	16.04	14.21	16.23	17.48	**15.97**
N_5(0.4% Zinc)	13.87	15.79	16.77	15.48	13.96	15.93	16.96	15.62	13.92	15.86	16.87	**15.55**
N_6 (0.6% Zinc)	13.95	15.85	16.86	15.55	14.04	15.99	17.05	15.69	14.00	15.92	16.96	**15.62**
N_7(0.04% Nano zinc)	13.73	15.65	16.58	15.32	13.82	15.79	16.77	15.46	13.78	15.72	16.68	**15.39**
N_8 (0.06% Nano zinc)	13.80	15.73	16.69	15.41	13.89	15.87	16.88	15.55	13.85	15.80	16.79	**15.48**
N_9 (0.3% Iron)	13.63	15.31	16.34	15.09	13.72	15.49	16.59	15.27	13.68	15.40	16.47	**15.18**
N_{10} (0.5%Iron)	13.68	15.38	16.45	15.17	13.77	15.56	16.70	15.34	13.73	15.47	16.58	**15.26**
N_{11}(0.03% Nano Iron)	13.54	15.18	16.16	14.96	13.63	15.36	16.41	15.13	13.59	15.27	16.29	**15.05**
N_{12} (0.05% Nano Iron)	13.57	15.25	16.27	15.03	13.66	15.43	16.52	15.20	13.62	15.34	16.40	**15.12**
Mean	13.83	15.70	16.76		13.92	15.85	16.97		**13.87**	**15.77**	**16.87**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	1.486	0.430	0.113		1.542	0.417	0.103		0.011	0.022	0.038	
CD at 5%	4.247	1.228	0.324		4.408	1.193	0.293		0.029	0.061	0.106	

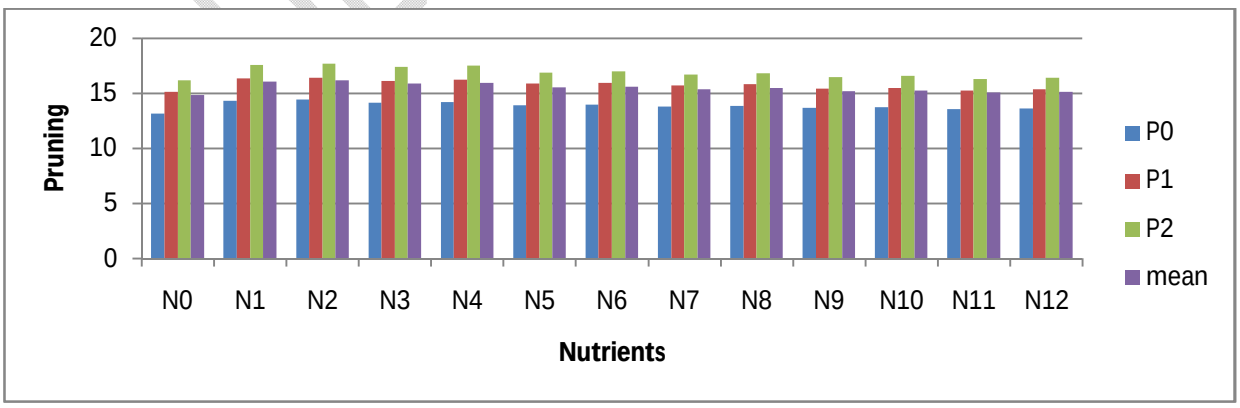

Fig: 5. Effect of pruning intensity and foliar feeding of nutrients on length of new sprout (cm) at 60 DAP.

Table: 6. Effect of pruning intensity and foliar feeding of nutrients on length of new sprout (cm) at 90 DAP.

Nutrients Factor B	Pruning factor A											
	Year 2022-23				Year 2023-24				Pooled			
	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	27.13	29.05	30.05	28.74	27.23	29.17	30.24	28.88	**27.18**	29.11	30.15	**28.81**
N_1 (2% Urea)	28.24	30.27	31.44	29.98	28.34	30.39	31.64	30.12	28.29	30.33	**31.54**	**30.05**
N_2 (3% Urea)	28.35	30.36	31.55	30.09	28.45	30.48	31.75	30.23	28.40	30.42	**31.65**	**30.16**
N_3 (0.2% Nano urea)	28.04	30.06	31.26	29.79	28.14	30.18	31.46	29.93	28.09	30.12	31.36	**29.86**
N_4 (0.3% Nano urea)	28.13	30.16	31.35	29.88	28.23	30.28	31.55	30.02	28.18	30.22	31.45	**29.95**
N_5(0.4% Zinc)	27.84	29.79	30.75	29.46	27.94	29.92	30.96	29.61	27.89	29.85	30.86	**29.53**
N_6 (0.6% Zinc)	27.92	29.85	30.84	29.54	28.02	29.98	31.05	29.68	27.97	29.91	30.95	**29.61**
N_7(0.04% Nano zinc)	27.70	29.65	30.56	29.30	27.80	29.78	30.77	29.45	27.75	29.71	30.67	**29.38**
N_8 (0.06% Nano zinc)	27.77	29.73	30.67	29.39	27.87	29.86	30.88	29.54	27.82	29.79	30.78	**29.46**
N_9 (0.3% Iron)	27.60	29.30	30.32	29.08	27.70	29.45	30.54	29.23	27.65	29.38	30.43	**29.15**
N_{10} (0.5%Iron)	27.65	29.37	30.43	29.15	27.75	29.52	30.65	29.31	27.70	29.45	30.54	**29.23**
N_{11}(0.03% Nano Iron)	27.51	29.17	30.14	28.94	27.61	29.32	30.36	29.10	27.56	29.25	30.25	**29.02**
N_{12} (0.05% Nano Iron)	27.54	29.24	30.25	29.01	27.64	29.39	30.47	29.17	27.59	29.32	30.36	**29.09**
Mean	27.80	29.69	30.74		27.90	29.82	30.95		**27.85**	**29.76**	**30.85**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	1.490	0.426	0.111		1.541	0.422	0.107		0.014	0.029	0.051	
CD at 5%	4.260	1.217	0.318		4.403	1.207	0.305		0.039	0.082	0.142	

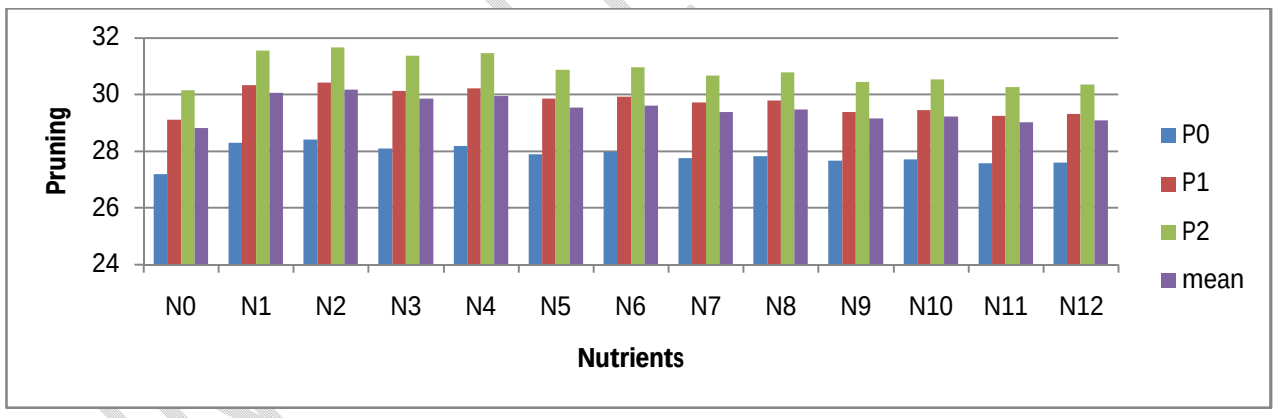

Fig: 6. Effect of pruning intensity and foliar feeding of nutrients on length of new sprout (cm) at 90 DAP.

Table: 7. Effect of pruning intensity and foliar feeding of nutrients on diameter of new sprout (cm) at 60 DAP.

Nutrients Factor B	Pruning factor A											
	Year 2022-23				Year 2023-24				Pooled			
	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	2.07	2.29	2.43	2.26	2.08	2.30	2.44	2.27	**2.08**	2.30	2.44	**2.27**
N_1 (2% Urea)	2.28	2.54	2.67	2.50	2.30	2.57	2.70	2.52	2.29	2.56	**2.69**	**2.51**
N_2 (3% Urea)	2.30	2.56	2.69	2.52	2.32	2.59	2.72	2.54	2.31	2.58	**2.71**	**2.53**
N_3 (0.2% Nano urea)	2.25	2.50	2.58	2.44	2.26	2.52	2.60	2.46	2.26	2.51	2.59	**2.45**
N_4 (0.3% Nano urea)	2.27	2.52	2.60	2.46	2.28	2.54	2.62	2.48	2.28	2.53	2.61	**2.47**
N_5(0.4% Zinc)	2.26	2.45	2.63	2.45	2.27	2.47	2.66	2.47	2.27	2.46	2.65	**2.46**
N_6 (0.6% Zinc)	2.28	2.47	2.65	2.47	2.29	2.49	2.68	2.49	2.29	2.48	**2.67**	**2.48**
N_7(0.04% Nano zinc)	2.22	2.41	2.53	2.39	2.23	2.43	2.55	2.40	2.23	2.42	2.54	**2.40**
N_8 (0.06% Nano zinc)	2.23	2.43	2.56	2.41	2.24	2.45	2.58	2.42	2.24	2.44	2.57	**2.42**
N_9 (0.3% Iron)	2.12	2.36	2.49	2.32	2.13	2.38	2.50	2.34	2.13	2.37	2.50	**2.33**
N_{10} (0.5%Iron)	2.15	2.38	2.51	2.35	2.16	2.40	2.52	2.36	2.16	2.39	2.52	**2.35**
N_{11}(0.03% Nano Iron)	2.16	2.32	2.44	2.31	2.17	2.34	2.45	2.32	2.17	2.33	2.45	**2.31**
N_{12} (0.05% Nano Iron)	2.18	2.34	2.47	2.33	2.19	2.36	2.48	2.34	2.19	2.35	2.48	**2.34**
Mean	2.21	2.43	2.56		2.22	2.45	2.58		**2.22**	**2.44**	**2.57**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	0.174	0.080	0.024		0.178	0.085	0.026		0.004	0.007	0.013	
CD at 5%	0.497	0.229	0.069		0.509	0.242	0.073		0.010	0.021	0.036	

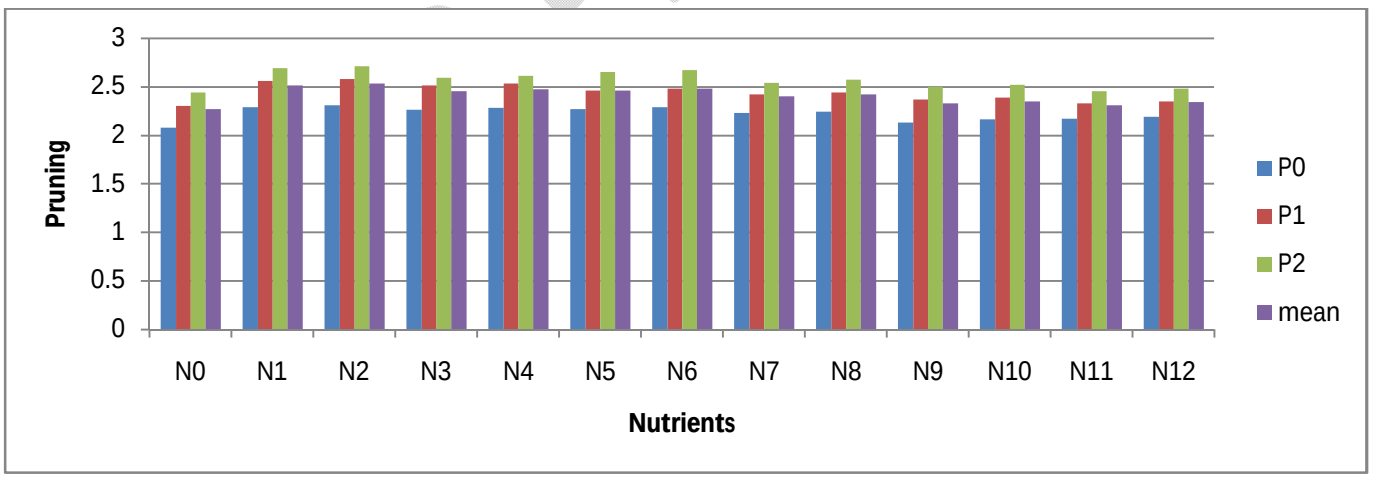

Fig: 7. Effect of pruning intensity and foliar feeding of nutrients on diameter of new sprout (cm) at 60 DAP.

Table: 8. Effect of pruning intensity and foliar feeding of nutrients on diameter of new sprout (cm) at 90 DAP.

Nutrients Factor B	Pruning factor A											
	Year 2022-23				Year 2023-24				Pooled			
	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean	P_0 (0 cm)	P_1 (25 cm)	P_2 (50 cm)	Mean
N_0 (Control)	3.01	3.19	3.30	3.17	3.02	3.20	3.32	3.18	**3.02**	3.20	3.31	**3.17**
N_1 (2% Urea)	3.22	3.44	3.57	3.41	3.24	3.47	3.61	3.44	3.23	3.46	3.59	**3.43**
N_2 (3% Urea)	3.24	3.46	3.59	3.43	3.26	3.49	3.63	3.46	3.25	3.48	**3.61**	**3.45**
N_3 (0.2% Nano urea)	3.19	3.40	3.53	3.37	3.20	3.42	3.56	3.39	3.20	3.41	3.55	**3.38**
N_4 (0.3% Nano urea)	3.21	3.42	3.55	3.39	3.22	3.44	3.58	3.41	3.22	3.43	3.57	**3.40**
N_5(0.4% Zinc)	3.20	3.35	3.48	3.34	3.21	3.37	3.51	3.36	3.21	3.36	3.50	**3.35**
N_6 (0.6% Zinc)	3.22	3.37	3.50	3.36	3.23	3.39	3.53	3.38	3.23	3.38	3.52	**3.37**
N_7(0.04% Nano zinc)	3.16	3.31	3.43	3.30	3.17	3.33	3.46	3.32	3.17	3.32	3.45	**3.31**
N_8 (0.06% Nano zinc)	3.17	3.33	3.46	3.32	3.18	3.35	3.49	3.34	3.18	3.34	3.48	**3.33**
N_9 (0.3% Iron)	3.06	3.26	3.38	3.23	3.07	3.28	3.41	3.25	3.07	3.27	3.40	**3.24**
N_{10} (0.5%Iron)	3.09	3.28	3.40	3.26	3.10	3.30	3.43	3.28	3.10	3.29	3.42	**3.27**
N_{11}(0.03% Nano Iron)	3.10	3.22	3.33	3.22	3.11	3.24	3.36	3.24	3.11	3.23	3.35	**3.23**
N_{12} (0.05% Nano Iron)	3.12	3.24	3.35	3.24	3.13	3.26	3.38	3.26	3.13	3.25	3.37	**3.25**
Mean	3.15	3.33	3.45		3.16	3.35	3.48		**3.16**	**3.34**	**3.47**	
	Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction		Pruning	Nutrient	Interaction	
SEm(±)	0.150	0.083	0.023		0.159	0.086	0.024		0.001	0.002	0.003	
CD at 5%	0.428	0.238	0.065		0.456	0.247	0.068		0.003	0.005	0.009	

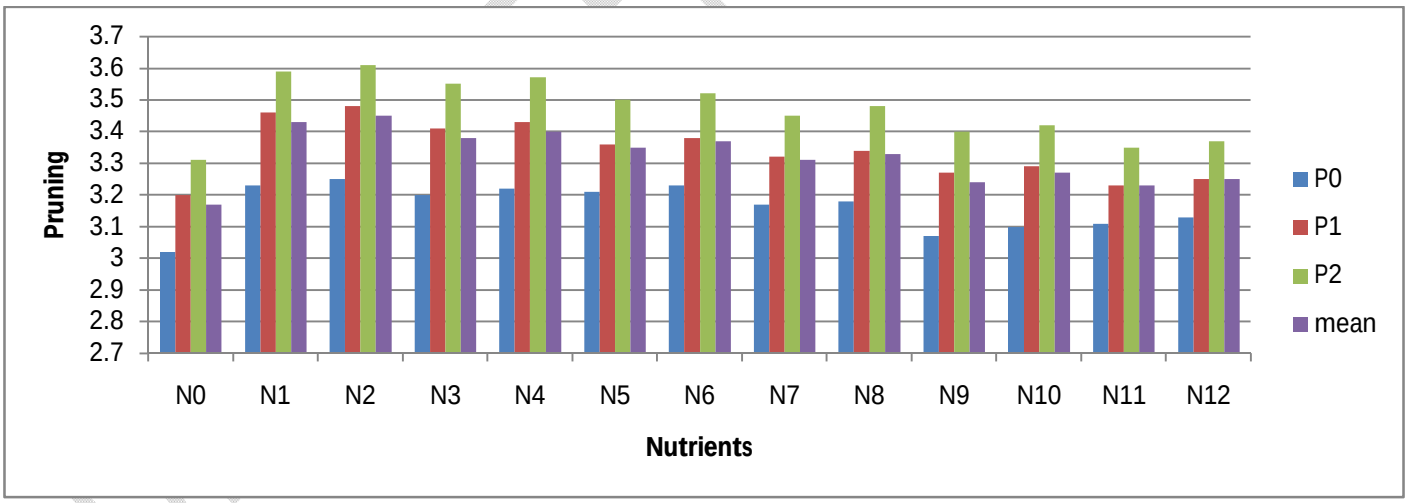

Fig: 8. Effect of pruning intensity and foliar feeding of nutrients on diameter of new sprout (cm) at 90 DAP.

Conclusion:

Based on the results obtained, it is concluded that pruning intensity and foliar feeding of nutrients and their combinations significantly influenced the growth parameters.Among the

treatment combinations, P_2N_2 (pruning of 50cm shoot from tip + Urea @ 3%)was found superior with respect to the maximum, increase in plant height (12.50%), plant spread N-S (13.40%)& E-W (14.83%), length of new sprout (17.68cm) & (31.65cm) and diameter of new sprout (2.71mm) & (3.61mm) at 60 and 90 DAP respectively. It is closely followed by $P_2 N_1$ (pruning at 50cm shoot from tip + Urea @ 2%) with respect to plant height (12.42%), plant spread N-S (13.30%) & E-W (14.76%), length of new sprout (17.57cm) & (31.54cm) and diameter of new sprout (2.69mm) & (3.59mm) at 60 and 90 DAP respectively.

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