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Effect of Foliar Application of Plant Growth Regulators and Nutrients on Fruit Set and Quality of Acid Lime (*Citrus aurantifolia* Swingle)

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ABSTRACT: A field experiment was carried out at Agro techno park, Krishi Vigyan Kendra, College of Agriculture, Gwalior (M.P.) during 2019-2020 and 2020-2021 under the agro-climatic conditions of Gwalior region. A total of 25 treatments were evaluated in a randomized block design in three replications. The objective of this work was to study about the effect of exogenous application of NAA, 2,4-D, urea and boron on fruit set, retention and yield. Keeping this view in mind, the present study set out to select the best treatment combinations of PGR'S and micro nutrients for increased fruit set and yield of acid lime. Variations in fruit set, retention and yield were recorded in two years among the treatments under the study. The fruit set percentage was highest in the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% (64.76 %) which was significantly superior to all the treatments under study followed by the treatment T_{18} - Urea 2% + 2,4-D 15ppm + NAA10 ppm + Boron 1% (63.69%). Lowest fruit set percentage was recorded in Control. When compared to soil drenching foliar application is the most effective method of application of plant growth regulators and micronutrients.

Keywords: Acid lime, 2,4-D, NAA, fruit set, yield, plant growth regulators and micronutrients.

INTRODUCTION

Acid lime (*Citrus aurantifolia,* Swingle), belongs to family Rutaceae is one of the most commercially grown fruit crop which is widely grown in tropical and sub-tropical region and is probably oriented in India. The principal cultivar grown widely is kagzi lime as it contains papery thin rind with abundant juice content (45%) and acidity (7-8%) and a good source of vitamin-C (6.3-6.6%). It finds several uses in culinary, beverage, industry and medicine like preparing pickles, squashes, and marmalades.

Acid lime is the third important citrus fruit crop in India next to mandarins and sweet oranges. Lime is found in most parts of the sub-tropics. In India, it is cultivated in Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Bihar, Madhya Pradesh, Assam and Chhatishgarh. In M.P., it is cultivated in Bhadavni, Khargon, Khandwa, Ujjain Ratlam, Mandsaur, Neemach, Sajapur, Gwalior, Burhanpur, Hosangabad, Morena, Guna, Jabalpur and Bhopal districts.

Fruits are available throughout the year since it blooms continuously, though the spring bloom is the heaviest (Devi *et al*., 2011). The flowering percentage of Ambe, Mrig and Hasth bahar occurs 47%, 36% and 17% respectively. The fruits of Hasth bahar fruits become available in April-May when harvesting of fruits coincides with heavy demand and are sold at premium price. Hence to force fruiting in Hasth bahar use of plant growth regulators and micronutrients group, this helps to reduce fruit drop and to improve and quality. Auxin compounds like Naphthalene Acetic Acid (NAA) and 2, 4- Dichlorophenoxyacetic acid plays a vital role in enhancing fruit set and reducing fruit drop (Kavinprashanth *et al.*, 2021). NAA improved the internal physiology of developing fruits in terms of better supply of water, nutrients and other bio-compounds vital for their proper growth and developing fruits in terms of better supply of water, nutrients and other bio-compounds vital for their proper growth and development which resulted in more fruit retention and reduce fruit drop as compared to control (Rajpal *et al.*, 2001). Foliar application of growth regulators are known to control fruit drop by balancing the internal status of auxin responsible for inhibiting the formation of abscission layer in citrus fruits and improve the productivity as well as quality of acid lime (Patel *et al.*, 2018).

MATERIAL AND METHODS

Field experiment was carried out during 2019-2020 and 2020-2021 under the agro-climatic conditions of Gwalior region. Eight years old uniform trees of Acid lime (*Citrus aurantifolia* Swingle) were selected for this study. A randomized block design was used to plan the experiment in three replications with 25 treatments and consisted of foliar spray of Urea, Boron, 2,4-D, NAA, and control (water spray) T_0 - Control(Water spray), T_1-Urea 1% + Boron 0.5%, T_2-Urea 1% + Boron 1%, T_3-Urea 2% + Boron 0.5%, T_4-Urea 2% + Boron 1%, T_5-2,4-D 15ppm + NAA 10ppm, T_6-2,4-D 15ppm + NAA 20ppm, T_7-2,4-D 30ppm + NAA

10ppm, T_8-2,4-D 30ppm + NAA 20ppm, T_9-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 0.5%, T_{10}-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 1%, T_{11}-Urea 1% + 2,4-D 15ppm + NAA 20ppm + Boron 0.5%, T_{12}-Urea 1% + 2,4-D 15ppm + NAA 20ppm + Boron 1%, T_{13}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 0.5%, T_{14}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 1%, T_{15}-Urea 1% + 2,4-D 30ppm + NAA 20ppm + Boron 0.5%, T_{16}-Urea 1% + 2,4-D 30ppm + NAA 20ppm + Boron 1%, T_{17}-Urea 2%+2,4-D 15 ppm + NAA 10ppm + Boron 0.5%, T_{18}-Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1%, T_{19}-Urea 2% + 2,4-D 15ppm + NAA 20ppm + Boron 0.5%, T_{20}-Urea 2% + 2,4-D 15ppm + NAA 20ppm + Boron 1%, T_{21}-Urea 2% + 2,4-D 30ppm + NAA 10ppm + Boron 0.5%, T_{22}-Urea 2% + 2,4-D 30ppm + NAA 10ppm + Boron 1%, T_{23}-Urea 2% + 2,4-D 30ppm + NAA 20ppm + Boron 0.5%, T_{24}-Urea 2% + 2,4-D 30ppm + NAA 20ppm + Boron 1%. Foliar application was applied two times at pre flowering and at pea size of fruits.

Fruit set and retention

Number of flowers per shoot (30, 60 and 90 DAS). Five flowering shoots per tree per replication were selected randomly and total number of flowers were counted on tagged shoots and average number of flowers per shoot were calculated.

Number of fruits per shoot (30, 60, 90 and 120 DAS). The number of fruits per plant was recorded separately for each plant at each picking.

Fruit set (%). Five shoot were selected randomly selected for recording fruit set. From each shoot initially number of fruits per shoot counted at pea stage and fruit set percentage was calculated by using following formula.

Fruit setting (%) = (Number of set fruits/ Number of flowers) × 100

Number of fruits per tree at harvest. The number of fruits per tree was recorded separately for each plant.

Average fruit weight (g) at harvest. From each tree 30 fruits were randomly selected and weight was recorded and average fruit weight was calculated and expressed in grams.

Yield per tree (kg) and Yield per hectare (q). The picked fruits from each experimental tree were weighed immediately by top pan balance after harvesting and yield per tree was recorded in kg per tree and later computed in quintals per hectare.

RESULT AND DISCUSSION

Fruit set and retention parameters

Number of flowers per shoot 30, 60 and 90 days after flowering. The maximum number of flowers per shoot 30 days after flowering (68.33) was recorded under the treatment T_{19}-Urea 2% + 2,4D 15ppm+NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (67.67) The minimum number of flowers per shoot 30 days after flowering (52.17) was recorded under T_0 (Control). The maximum number of flowers per shoot 60 days after flowering (93.50 was recorded under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study. The minimum number of flowers per shoot 60 days after flowering (72.67) was recorded under Control. The maximum number of flowers per shoot 90 days after flowering (133) was taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study. The minimum number of flowers per shoot 90 days after flowering (106.50) was recorded under Control. The present findings have been supported by Banghel and Tiwari (2003); Patel *et al.* (2018).

Number of fruits per shoot 30, 60, 90 and 120 days after fruit set. The maximum number of fruits per shoot 30 days after fruit set (76.83) was taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (73.67). The minimum number of fruits per shoot 30 days after fruit set (54.67) was recorded under Control. The maximum number of fruits per shoot 60 days after fruit set (72.00) was taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (67.00). The minimum number of fruits per shoot 60 days after fruit set (44.17) was recorded under Control. The maximum number of fruits per shoot 90 days after fruit set (64.17) was taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (60.00). The minimum number of fruits per shoot 90 days after fruit set (40.17) was recorded under Control. The maximum number of fruits per shoot 120 days after fruit set (55.83) was taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (48.17). The minimum number of fruits per shoot 120 days after fruit set (30.17) was recorded under Control. The present findings are close to those of Reddy and Prasad (2012); Somwanshi *et al.* (2017); Kavinprashanth *et al.* (2021).

Fruit set (%). The maximum fruit set percentage (64.76) were taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (63.69). The minimum number of fruit set percentage (44.33) was recorded under T_0 (Control). The present findings have been supported by Stern *et al.* (2007); Somwanshi *et al.* (2017); Chouhan *et al.* (2018); Yamini *et al.* (2021).

Yield parameters

Number of fruits per tree at harvest: The maximum number of fruits per tree at harvest (956.50) were taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (952.67). The

minimum number of fruits per tree at harvest (837.67) was recorded under T_0 (Control.) The present findings are in line with the report of Tagad *et al.* (2018); Helal *et al.* (2019).

Average fruit weight (g) at harvest: The maximum average fruit weight (g) at harvest (32.92) were taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (31.02). The minimum average fruit T3.59) was recorded under T_0 (Control). Findings of similar sort and values have been reported by Kumar *et al.* (2009); Senjam *et al.* (2018).

Yield per tree (kg) and Yield per hectare (q): The maximum yield per tree (31.49 kg/tree) were taken under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (29.54 kg/tree). The minimum yield per tree (19.77 kg/tree) was recorded under T_0 (Control). Similar findings have been revealed by Nawaz *et al.* (2008); Ashraf *et al.* (2013). The maximum yield per hectare (349.90q/ha) was recorded under the treatment T_{19}-Urea 2% + 2,4D 15ppm + NAA 20ppm + Boron 0.5% which was significantly superior to all the treatments under study except T_{18} - Urea 2% + 2,4-D 15ppm + NAA 10ppm + Boron 1% (328.15 q/ha). The minimum yield per hectare (219.59 q/ha) was recorded under Control. The present findings are close to those of Ingle *et al.* (2001).

Table 1 : Fruit set and retention in Acid Lime.

Treatment	Number of flowers per shoot (DAF)*			Number of fruits per shoot ((DAFS)**				Fruit set (%)
	30	60	90	30	60	90	120	
T_0-Control (Water spray)	52.17	72.67	106.50	54.67	44.17	40.17	30.17	44.33
T_1-Urea 1% + Boron 0.5%	54.83	73.67	108.33	55.17	48.00	42.67	31.50	47.25
T_2-Urea 1% + Boron 1%	55.67	76.83	109.83	56.67	48.17	43.50	32.17	48.35
T_3 -Urea 2% + Boron 0.5%	56.33	77.67	110.33	59.67	49.00	44.17	33.17	51.21
T_4-Urea 2% + Boron 1%	56.67	78.17	112.33	60.17	50.83	46.00	33.50	52.61
T_5-2,4-D 15ppm + NAA 10ppm	57.00	79.50	114.17	60.17	51.83	46.67	34.67	53.66
T_6-2,4-D 15ppm + NAA 20ppm	57.83	79.50	115.00	62.67	53.17	48.83	35.33	54.05
T_7-2,4-D 30ppm + NAA 10ppm	58.17	80.17	115.67	62.83	53.67	49.33	37.00	54.86
T_8-2,4-D 30ppm + NAA 20ppm	58.50	80.17	115.83	63.67	54.67	49.67	38.00	55.10
T_9-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 0.5%	58.67	81.33	116.17	65.33	55.33	50.33	38.33	55.19
T_{10}-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 1%	59.00	81.50	116.83	65.67	56.33	50.67	39.50	55.45
T_{11}-Urea1% + 2,4-D 15ppm + NAA 20ppm + Boron 0.5%	59.33	81.67	118.83	66.00	56.17	51.33	39.67	55.85
T_{12}-Urea1% + 2,4-D 15ppm + NAA 20ppm + Boron 1%	59.83	82.17	119.83	66.50	57.33	51.50	40.33	55.99
T_{13}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 0.5%	60.50	82.83	120.33	66.67	58.00	51.83	41.17	56.17
T_{14}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 1%	61.00	83.00	120.83	68.00	58.33	52.50	41.33	56.34
T_{15}-Urea 1% + 2,4-D 30ppm + NAA 20ppm + Boron 0.5%	61.67	83.17	121.00	68.33	59.33	53.50	42.00	56.46
T_{16}-Urea 1%+2,4-D 30ppm + NAA 20ppm + Boron 1%	62.17	83.67	121.67	69.33	60.83	54.33	42.83	57.22
T_{17}-Urea 2%+2,4-D 15 ppm + NAA 10ppm + Boron 0.5%	64.67	86.33	124.50	71.00	63.17	56.67	45.17	57.55
T_{18}-Urea 2%+2,4-D 15ppm + NAA 10ppm + Boron 1%	67.67	91.83	132.33	73.67	67.00	60.00	48.17	63.69
T_{19}-Urea 2%+2,4-D 15ppm + NAA 20ppm + Boron 0.5%	68.33	93.50	133.83	76.83	72.00	64.17	55.83	64.76
T_{20}-Urea 2%+2,4-D 15ppm + NAA 20ppm + Boron 1%	66.83	90.50	129.33	73.00	65.17	58.83	46.83	62.42
T_{21}-Urea 2% +2,4-D 30ppm + NAA 10ppm + Boron 0.5%	65.67	88.83	126.67	72.00	64.33	58.50	46.83	60.67
T_{22}-Urea 2%+2,4-D 30ppm + NAA 10ppm + Boron 1%	65.17	87.67	125.67	71.33	63.83	58.00	46.17	59.87
T_{23}-Urea 2%+2,4-D 30ppm + NAA 20ppm + Boron 0.5%	63.83	84.83	123.17	70.67	62.50	56.17	44.33	58.72
T_{24}-Urea 2%+2,4-D 30ppm + NAA 20ppm + Boron 1%	63.17	84.33	122.33	70.00	61.67	55.17	43.50	58.21
SE.m.±	**1.91**	**2.46**	**3.33**	**2.19**	**2.43**	**2.23**	**2.03**	**2.27**
CD at 5%	**5.40**	**6.94**	**9.38**	**6.17**	**6.86**	**6.27**	**5.71**	**6.39**

(DAF)* Days after flowering; (DAFS) **Days after fruit set

Table 2: Yield Parameters in Acid Lime.

Treatment	Number of fruits per tree at harvest	Average fruit weight (g) at harvest	Yield per tree (kg)	Yield per hectare (q)
T_0 – Control (Water spray)	837.67	23.59	19.77	219.59
T_1- Urea 1% + Boron 0.5%	840.17	24.32	20.45	227.21
T_2-Urea 1% + Boron 1%	844.83	24.45	20.65	229.42
T_3 -Urea 2% + Boron 0.5%	851.83	24.91	21.26	236.16
T_4-Urea 2% + Boron 1%	854.67	25.63	21.94	243.76
T_5-2,4-D 15ppm + NAA 10ppm	855.50	25.95	22.20	246.63
T_6-2,4-D 15ppm + NAA 20ppm	866.33	26.78	23.28	258.69
T_7-2,4-D 30ppm + NAA 10ppm	869.17	26.97	23.40	259.96
T_8-2,4-D 30ppm + NAA 20ppm	872.00	27.47	23.97	266.29
T_9-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 0.5%	877.00	27.61	24.19	268.79
T_{10}-Urea 1% + 2,4-D 15ppm + NAA 10ppm + Boron 1%	882.50	27.78	24.60	273.31
T_{11}-Urea1% + 2,4-D 15ppm + NAA 20ppm + Boron 0.5%	888.83	27.92	24.87	276.34
T_{12}-Urea1% + 2,4-D 15ppm + NAA 20ppm + Boron 1%	891.17	28.12	25.08	278.65
T_{13}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 0.5%	899.17	28.15	25.34	281.55
T_{14}-Urea 1% + 2,4-D 30ppm + NAA 10ppm + Boron 1%	900.33	28.36	25.43	282.50
T_{15}-Urea 1% + 2,4-D 30ppm + NAA 20ppm + Boron 0.5%	905.17	28.47	25.78	286.40
T_{16}-Urea 1%+2,4-D 30ppm + NAA 20ppm + Boron 1%	911.50	28.57	26.06	289.47
T_{17}-Urea 2%+2,4-D 15 ppm + NAA 10ppm + Boron 0.5%	923.67	29.74	27.47	305.15
T_{18}-Urea 2%+2,4-D 15ppm + NAA 10ppm + Boron 1%	952.67	31.02	29.54	328.15
T_{19}-Urea 2%+2,4-D 15ppm + NAA 20ppm + Boron 0.5%	956.50	32.92	31.49	349.90
T_{20}-Urea 2%+2,4-D 15ppm + NAA 20ppm + Boron 1%	944.67	30.72	29.03	322.52
T_{21}-Urea 2% +2,4-D 30ppm + NAA 10ppm + Boron 0.5%	932.83	30.17	28.13	312.48
T_{22}-Urea 2%+2,4-D 30ppm + NAA 10ppm + Boron 1%	920.83	29.14	26.86	298.38
T_{23}-Urea 2%+2,4-D 30ppm + NAA 20ppm + Boron 0.5%	919.50	28.93	26.61	295.61
T_{24}-Urea 2%+2,4-D 30ppm + NAA 20ppm + Boron 1%	916.83	28.54	26.18	290.83
SE(m)±	**16.95**	**0.82**	**0.91**	**10.15**
CD(5%)	**47.70**	**2.33**	**2.57**	**28.58**

CONCLUSIONS

The result clearly indicates that the treatment combination T_{19}-Urea 2% + 2,4-D 15ppm + NAA 20ppm + Boron 0.5% was found to be significantly superior to all the treatments under study and resulted in increased number of flowers per shoot at 30 days (68.33), 60 days (93.50) and 90 days (133.83) after flowering, number of fruits per shoot at 30 days (76.83), 60 days (72.00), 90 days (64.17) and 120 days (55.83) after fruit set, number of fruits per tree (956.50), average fruit weight (g) at harvest (32.92), yield per tree (kg) (31.49) and yield per hectare(q.) (349.90) compared to control. Hence this treatment combination will be very useful in minimizing the loss in yield and quality characters thereby helping farmers gain more returns on their crop.

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Conflict of Interest. None.

REFERENCES

Ashraf, M. Y., Asshraf, M., Akhtar, M., Mahmood, K. and Saleem, M. (2013). Improvement in yield, quality and reduction in fruit drop in Kinnow (*Citrus reticulata* Blanco.) by exogenous application of plant growth regulators, potassium and zinc. *Pakistan J. Bot*., *45*(SI), 433-440.

Banghel, B. S. and Tiwari, R. (2003). Individual and integrated effect of urea and NAA on flowering and fruiting of mango (*Mangifera indica* L.). *South Indian Hort*., *51*(1- 6), 1-6.

Chouhan, A., Sonkar, P., Kanpure, R. N., Ajanawe, S. R. and Haldar, A. (2018). Response of foliar spray of Urea, Boron and 2,4-D in acid lime (*Citrus aurantiafolia* Swingle) under Malwa plateau conditions. *International Journal of Agriculture Sciences*, *10*(7), 5727-5729.

Devi, H. L., Sarkar, S. K., Dhanabati, L. and Majhi, D. (2011). Flushing - flowering behavior and regulation in acid lime - A critical review and research interventions. *J. Crop Weed*., *7*(2), 87-90.

Helal, M. E. M., Ashour, N. E., Merwad, M. M. and Mansour, A. E. M. (2019). Effect of some Growth Regulators and Boron on Fruiting and Quality of Orange. *Middle East Journal of Agriculture Research*, *8*(2), 594-599.

Ingle, H. V., Rathod, N. G. and Patil, D. R. (2001). Effect of growth regulators and mulching on yield and quality of Nagpur mandarin. *Annals J. Plant Phys*., *15*(1), 85-88.

Kavinprashanth, R., Paramaguru, P., Aneesa Rani, M. S. and Sujatha, K. B. (2021). Impact of foliar application of growth regulators and micronutrients on yield and quality of acid lime (*Citrus aurantifolia* Swingle). *Journal of Pharmacognosy and Phytochemistry*, *10*(1), 2091-2093.

Kumar, M., Kumar, R. and Singh, R. P. (2009). *Int. J. Agr. Sci*., *5*(2), 521-524.

Nawaz, M. A. Waqar, A., Saeed, A. and Khan, M. M. (2008). Role of growth regulators on pre harvest fruit drop, yield and quality in kinnow mandarin. *Pakistan J. Bot*., *40*(5), 1971-1981.

Patel, N., Pandey, S. K. and Pandey, C. S. (2018). Influence of urea and plant growth regulators on fruit retention, fruit drop and fruit yield of acid lime var. kagzi

(*Citrus aurantifolia* Swingle). *International Journal of agricultural science*, *10*(18), 7189-7191

Rajpal, L. S., Godhra, N. R., Rajbir, S. and Dahiya, S. S. (2001). *Haryana J. Hort. Sci*., *30*, 161-164.

Reddy, P. and Prasad, D. M. (2012). Effect of plant growth regulators on fruit characters and yield of pomegranate (*Punica granatum L*.) cv. Ganesh. *International Journal of Plant Horticultural Science*, *100*, 4-8.

Senjam, B. D., Singh, S. R. and Lian, H. N. (2018). Effect of different PGR and Urea on Fruit Drop and Yield of Assam lemon [*Citrus limon* (L.) Burm.] *International Journal of current microbiology and applied sciences*, *7*(7), 2884-2892.

Somwanshi, B. S., Patil, M. B., Nainwad, R. V., and Shinde, S. E. (2017). Effect of different chemicals on pre-harvest fruit drop and fruit set of sweet orange (*Citrus sinensis* osbeck) var. Nucellar. *International Journal of Chemical Studies*, *5*(4), 168-171.

Stern, Flaishman, R. A., Applebaum, M. and Arie-Ben, S. R. (2007). Effect of synthetic auxins on fruit development of 'Bing' cherry *(Prunus avium* L.). *Scientia Hort., 4*, 275-280.

Tagad, S. S., Patil, M. B., Patil, S. G. and Deshpande, D. P. (2018). Effect of foliar application of plant growth regulators and micronutrients on growth and yield parameters of acid lime (*Citrus aurantifolia* L.) CV. Sai Sarbati. *Journal of Pharmacognosy and Phytochemistry*, *7*(5), 741-744.

Yamini, Huchche, A. D., Dhongade, A., Thirugnanavel, A. and Kumar, V. (2021). Effect of Foliar Application of Growth Regulators and Nutrients on Fruit Retention and Yield of acid Lime (*Citrus aurantifolia* Swingle). *Biological Forum – An International Journal*, *13*(3a), 348-354.

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