Plant Archives Vol. 25, No. 2, 2025 pp. 1773-1778 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org

DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2025.v25.no.2.256

INFLUENCE OF SOWING DATES AND PINCHING ON GROWTH PARAMETERS OF DOLICHOS BEAN (*LABLAB PURPUREUS* L.) CV. DR YSRHU-SHRESTA

K. Teja Sree[1]*, M. Ravindra Babu[2], E. Padma[1] and K. Umakrishna[3]

[1]Department of Vegetable Science, College of Horticulture, Dr.YSR Horticultural University, Venkataramannagudem - 534 101, Andhra Pradesh, India.

[2]Horticultural Research Station, Dr. YSR Horticultural University, Darsi - 523 247, Andhra Pradesh, India.

[3]Department of Statistics, College of Horticulture, Dr.YSR Horticultural University, Venkataramannagudem - 534 101, Andhra Pradesh, India.

*Corresponding authors E-mail : tejakhandavalli584@gmail.com

(Date of Receiving-19-07-2025; Date of Acceptance-25-09-2025)

ABSTRACT

During *Kharif* 2024-25, a field experiment was carried out at the Horticultural Research Station, Dr. Y. S. R. Horticultural University, Venkataramannagudem, to determine the optimum time of sowing and pinching treatment of dolichos bean cv. Dr. YSRHU-Shresta. The experiment was carried with three different sowing dates *viz.*,second week of August (D_1), second week of September (D_2) and second week of October (D_3) along with three pinching treatments *viz.*,without pinching of growing tips (P_1), pinching of growing tip at the height of pendal and allowing branching at the same height (P_2) and pinching at 2 feet height initially and subsequent pinching to maintain bush shape (P_3) were evaluated in factorial randomized block design (FRBD) with three replications. The findings of the investigation revealed that among the three different dates of sowing, second week of August (D_1) recorded significantly higher vine length, leaf area per plant, whereas the lowest values were observed with D_3 (second week of October). Maximum internodal length was noted under D_2 (second week of September) while highest leaf chlorophyll content was recorded under D_3 (second week of October).

Key words : Dolichos bean, Sowing dates, Pinching, Growth parameters.

Introduction

One of India's major leguminous vegetable crops, the dolichos bean (*Lablab purpureus* L.) (2n = 22) is a member of the Fabaceae family. The Greek word "dolichos" means "long pods," whereas the Arabic word "lablab" implies "production of sound by dried seeds in the pods." Other names for it include Egyptian bean, Indian bean, hyacinth bean, lablab bean, bonavista vine, and Australian pea. Lablab contributes to deal with food security, nutrient deficiencies, diversification of diets, generation of income, health benefits, soil conservation and climate-smart crop (Joshi *et al*., 2020). In Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, and Maharashtra, it is cultivated as a field crop.

It is a very good source of protein, amino acids such as lysine, vitamins (A, C & Riboflavin) and minerals (Ca, Fe, Mg, S, Na & P). The bean contains kievitone, a flavonoid that may help fight breast cancer (Hoffman, 1995). Recent studies have shown that Indian bean extracts can protect against viral diseases including influenza and SARS-CoV-2, which was declared a global pandemic (Liu *et al*., 2020). This emphasizes how critical it is to increase both its production and use.

Sowing photo insensitive varieties at different dates or staggered sowing enhances the availability of produce in the market thereby fetching higher prices to the farmer. Sowing date is one of the most critical elements which have tremendous effect on growth, development and

biological yield of a crop species (Fagnano *et al*., 2009; Compant *et al*., 2010). According to Padma *et al*. (2018), field bean vegetative qualities were significantly impacted by the dates of sowing.

Pinching, a simple yet effective horticultural technique, involves removing or trimming the growing tips of plants to encourage bushy growth, increase yields, and improve overall plant quality. Pruning boosts, a plant's fruit yield and photosynthetic efficiency (Rajewar and Patil, 1979; Ambroszczyk *et al*., 2008).

While pinching has been widely adopted in various crops, its effects on dolichos bean growth, yield, and quality remain largely unexplored.

Materials and Methods

The investigation entitled "Influence of sowing dates and pinching on growth parameters of dolichos bean (*Lablab purpureus* L.) cv. Dr YSRHU-Shresta" was carried out during *kharif*, 2024-25 at Horticultural Research Station, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh. The site is situated at 16.6^0N latitude and 81.2^0 E longitude, with an average annual rainfall of 900 mm at an altitude of 34 m (112 feet) above mean sea level.

The experimental area was properly ploughed for 2-3 times to make the soil friable. Weeds and stubbles were removed and discarded. Prior to final ploughing, the recommended FYM and basal fertilizer were incorporated into the soil. The entire plot was divided into subplots. The recommended dose of N, P, and K (20:60:50 kg per ha) were applied in the form of urea, single superphosphate and muriate of potash, respectively. Nitrogen was applied in two splits: half of the nitrogen (10 per ha) as a basal dose and the remaining half of the nitrogen (*i.e.*, 10 kg) as a top dressing at 30 days after sowing. The total amount of phosphorous and potash was applied at sowing as a basal dose. The experiment was laid out with nine different treatment combinations in Factorial Randomized Block Design (FRBD) with three replications.

Treatment details

Factor 1: Dates of sowing (3 Levels)

D_1 : Second week of August

D_2 : Second week of September

D_3 : Second week of October

Factor 2: Pinching (3 Levels)

P_1 : Without pinching of growing tips.

P_2 : Pinching of growing tip at the height of Pendal and allowing branching at the same height.

P_3 : Pinching at 2 feet height initially and subsequent pinching to maintain bush shape.

Studied parameters

The parameters which were studied to find out the influence of sowing dates and pinching on growth parameters of dolichos bean are as follows.

Vine length (cm): Vine length was measured from five randomly selected tagged plants within the net plot area. It was measured from ground level to the tip of the

Table 1 : Details of Treatments.

S. no.	Treatments	Treatment combinations
1	$T_1(D_1P_1)$	Second week of August+ Without pinching of growing tips.
2	$T_2(D_1P_2)$	Second week of August + Pinching of growing tip at the height of pendal and allowing branching at the same height.
3	$T_3(D_1P_3)$	Second week of August + Pinching at 2 feet height initially and subsequent pinching to maintain bush shape.
4	$T_4(D_2P_1)$	Second week of September + Without pinching of growing tips.
5	$T_5(D_2P_2)$	Second week of September + Pinching of growing tip at the height of pendal and allowing branching at the same height.
6	$T_6(D_2P_3)$	Second week of September + Pinching at 2 feet height initially and subsequent pinching to maintain bush shape.
7	$T_7(D_3P_1)$	Second week of October + Without pinching of growing tips.
8	$T_8(D_3P_2)$	Second week of October + Pinching of growing tip at the height of pendal and allowing branching at the same height.
9	$T_9(D_3P_3)$	Second week of October + Pinching at 2 feet height initially and subsequent pinching to maintain bush shape.

main shoot, and the average was calculated.

Leaf area per plant (cm²): The leaf area per plant was recorded in five sample plants using a digital leaf area meter (SYSTRONICS-211 model and the average was computed.

Internodal length (cm): The internodal length was measured by using a metric scale and expressed in centimeters. Observations were made from five plants randomly selected from each experimental unit.

Leaf chlorophyll content (SPAD units): Leaf chlorophyll content was measured from five sample plants using a digital chlorophyll SPAD meter, and the average was calculated and expressed in SPAD units.

Statistical analysis

These parameters were then statistically analyzed using analysis of variance (ANOVA) as it relates to the Factorial Randomized Block Design. The critical differences (CD) at the same level of probability were used to test for differences in treatment means.

Results and Discussion

Vine length (cm)

Maximum vine length of 219.33 cm was recorded with sowing on D_1 (second week of August) which was significantly superior over the other sowing dates. It was followed by D_2 and D_3 with 202.49 cm, 197.75 cm, respectively. This could be attributed to the fact that early sowing dates likely resulted in a longer growth phase and favourable climatic conditions, such as high light intensities which encouraged better vegetative growth. As a result, plant height may have decreased (Pandey *et al.*, 2012). The current findings are consistent with those of Joshi and Rahevar (2014), Kharbamon *et al.* (2016), Choudhary *et al.* (2020).

Pinching treatment also significantly influences the vine length of dolichos bean. The treatment without pinching of growing tips (P_1) found significantly superior (331.70 cm) over the treatments with pinching of growing tip at the height of pendal and allowing branching at the same (P_2) and pinching at 2 feet height initially and subsequent pinching to maintain bush shape (P_3) with 212.29 cm and 76.64 cm respectively. The outcome may be the result of pinching, which minimizes plant height as it removes the apical part of the plant where auxin (a hormone that promotes stem elongation) is produced. As a result, the auxin is diverted to the lateral buds, resulting in shorter plants and more lateral branches (Ajanya *et al.*, 2023). Similar findings were previously documented by Anand *et al.* (2014).

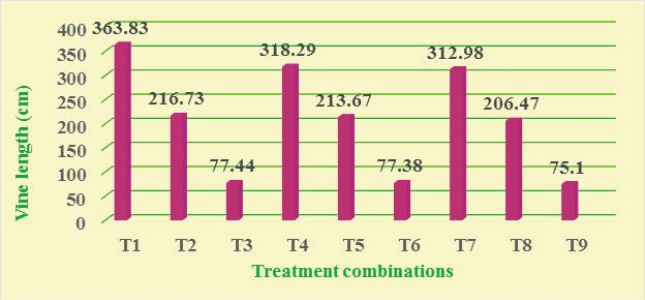

Fig. 1 : Influence of sowing dates and pinching on vine length (cm) of dolichos bean (*Lablab purpureus*. L) cv. Dr YSRHU-Shresta.

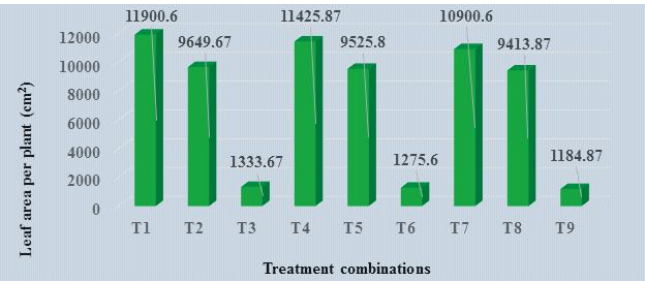

Fig. 2 : Influence of sowing dates and pinching on leaf area per plant (cm²) of dolichos bean (*Lablab purpureus*. L) cv. Dr YSRHU-Shresta.

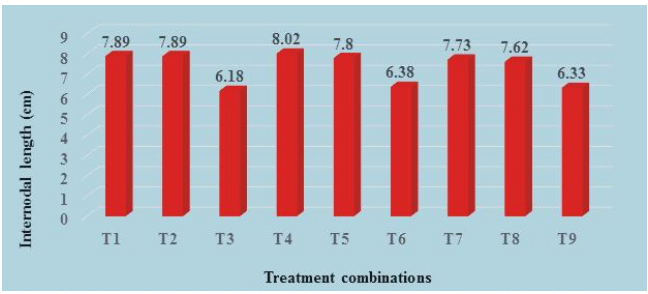

Fig. 3 : Influence of sowing dates and pinching on internodal length (cm) of dolichos bean (*Lablab purpureus*. L) cv. Dr YSRHU- Shresta.

Leaf area per plant (cm²)

The maximum leaf area per plant (7627.98 cm²) was recorded when crop was sown in the second week of August (D_1). It was significantly superior over the rest of the dates of sowing. It was followed by D_2 and D_3 with7409.09 cm², 7166.44 cm² respectively. Early-sown plants have larger leaf area per plant than later-sown plants due to higher light intensities than later planting dates. Plant cells are injured as a result of increased warmth and light intensity, reducing photosynthetic rate (Ahuja *et al.*, 2010). The current research findings closely align with those of Padma *et al.* (2018), Ahmad *et al.* (2024).

Pinching treatment also significantly influences the leaf area per plant in dolichos bean. The treatment without pinching of growing tips (P_1) recorded highest leaf area (11409.02 cm²) significantly superior over the treatment

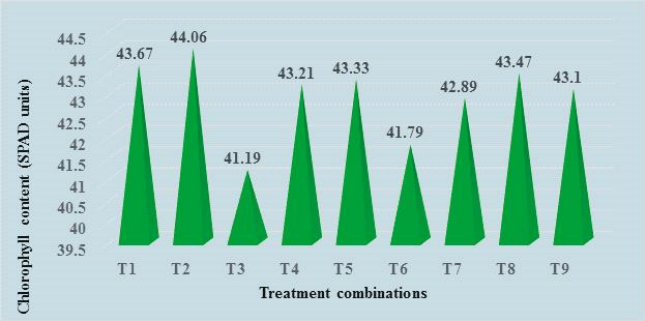

Fig. 4 : Influence of sowing dates and pinching on leaf chlorophyll content (SPAD units) of dolichos bean (*Lablab purpureus*. L) cv. Dr YSRHU-Shresta.

with pinching of growing tip at the height of pendal and allowing branching at the same (P_2) and pinching at 2 feet height initially and subsequent pinching to maintain bush shape (P_3) with 9529.78 cm^2 and 1264.71 cm^2 respectively. Pinching eliminates apical dominace which results in reduced plant height and number of branches thereby leaf area was also reduced. The findings of the current study are consistent with those of Manikanta *et al*. (2020).

Internodal length (cm)

The table clearly shows that the crop sown in the second week of September (D_2) had the highest internodal length with 7.40 cm, while the crop sown in the second week of October (D_3) had the lowest internodal length with 7.23 cm. This could be attributed to favourable weather conditions such as ideal temperature, increased soil moisture availability, and better light interception during the vegetative growth stage. The current research findings are roughly consistent with those of Bake *et al.* (2017), Sawale *et al.* (2022).

Pinching treatment significantly influences the internodal length of dolichos bean. The treatment without pinching of growing tips (P_1) found significantly superior (7.88 cm) over the treatment with pinching of growing tip at the height of pendal and allowing branching at the same (P_2) and pinching at 2 feet height initially and subsequent pinching to maintain bush shape (P_3) with 7.7 cm and 6.30 cm respectively. The maximum internodal length was observed in plants without pinching, which can be linked to the maintenance of apical dominance. In unpinched plants, the apical bud continuously generates auxins that promote cell elongation and vertical growth, leading to longer internodes. In contrast, pinched plants, where the apical bud is removed, show reduced auxin levels at the shoot tip, which restricts internodal elongation and promotes lateral branching instead (Dahal *et al.*, 2024). The findings of the current study are consistent with those of Firoz *et al.* (2010).

Leaf chlorophyll content (SPAD Units)

SPAD value was not significantly influenced with different dates of sowing in dolichosbean. The crop sown during the second week of October (D_3) recorded the highest leaf chlorophyll content with SPAD value of 43.15, while the crop sown during the second week of August (D_1) had the lowest SPAD value of 42.78. This could be attributable to the significantly lower temperatures and shorter day lengths experienced during the vegetative phase of October sowing, which minimize photo-oxidative stress and promote better chlorophyll stability in leaves. Such circumstances often promote chlorophyll biosynthesis while delaying chlorophyll breakdown, leading in greater pigment concentrations. The present research outcomes are broadly in agreement with those reported earlier by Pramoda and Sajjan (2018), Choudhary *et al.* (2020).

Pinching treatment significantly influences the leaf chlorophyll content (SPAD) of dolichos bean. Among the treatments, treatment with pinching of growing tip at the height of pendal and allowing branching at the same (P_2) found significantly superior (43.62 SPAD) over the treatment without pinching of growing tips (P_1) and pinching at 2 feet height initially and subsequent pinching to maintain bush shape (P_3) with 43.25 SPAD and 42.03 SPAD, respectively. Pinching enhances the translocation of photosynthates from source to sink increasing the amount of chlorophyll in leaf tissue. Pinching also allows more interception of light thereby increases photosynthetic activity and chlorophyll synthesis (Sowmya *et al*., 2017). The results obtained in present investigation are correlated with those of Ajanya *et al.* (2023).

Interaction effects between sowing dates and pinching

Significant interactions were found between sowing dates and pinching. When the crop was sown during the second week of August with no pinching of growing tips (D_1P_1), the maximum vine length (363.83 cm) and higher leaf area per plant (11900.60 cm^2) were recorded as compared to the rest of the treatment combinations, while internodal length and leaf chlorophyll content showed no significant differences. Maximum internodal length (8.02 cm) and greatest leaf chlorophyll content (44.06 SPAD) were observed in the second week of August with pinching of the growing tip at the height of the pendal and allowing branching at the same height (D_1P_2) when compared to the rest of the treatment combinations (Table 2).

Table 2 : Influence of sowing dates and pinching on growth parameters of dolichos bean cv. Dr YSRHU-Shresta.

	Vine length (cm)	Leaf area per plant (cm^2)	Internodal length(cm)	Leaf chlorophyll content (SPAD units)
Dates of sowing(D)				
D_1	219.33	7627.98	7.32	42.97
D_2	202.49	7409.09	7.4	42.78
D_3	197.75	7166.44	7.23	43.15
S. Em ±	1.12	30.84	0.06	0.42
C.D. at 5%	3.27	92.45	NS	NS
Pinching (P)				
P_1	331.7	11409.02	7.88	43.25
P_2	212.29	9529.78	7.77	43.62
P_3	76.64	1264.71	6.3	42.03
S. Em ±	1.12	30.84	0.06	0.42
C.D. at 5%	3.27	92.45	0.18	1.25
Interaction effects				
$T_1 (D_1P_1)$	363.83	11900.60	7.89	43.67
$T_2 (D_1P_2)$	318.29	11425.87	8.02	44.06
$T_3 (D_1P_3)$	312.98	10900.60	7.73	41.19
$T_4 (D_2P_1)$	216.73	9649.67	7.89	43.21
$T_5 (D_2P_2)$	213.67	9525.80	7.80	43.33
$T_6 (D_2P_3)$	206.47	9413.87	7.62	41.79
$T_7 (D_3P_1)$	77.50	1333.67	6.18	42.89
$T_8 (D_3P_2)$	77.50	1275.60	6.38	43.47
$T_9 (D_3P_3)$	73.80	1184.87	6.33	43.10
S. Em ±	1.88	53.41	0.11	0.72
C.D. at 5%	7.38	160.13	NS	NS

NS: Non-Significant; Sowing dates (S): D_1- Sowing on second week of August; D_2-Sowing on second week of September; D_3-Sowing on second week of October; Pinching (P): P_1- Without pinching of growing tips; P_2- Pinching of growing tip at the height of pendal and allowing branching at the same height; P_3- Pinching at 2 feet height initially and subsequent pinching to maintain bush shape.

Conclusion

Based on the findings of the present investigation, it can be concluded that both the different dates of sowing and pinching significantly influenced the growth of dolichos bean. Among the various treatments evaluated, sowing during second week of August (D_1) and pinching of growing tip at the height of pendal and allowing branching at the same (P_2) demonstrated notable advantages, resulting in enhanced growth.

Acknowledgement

I would like to express my heartfelt gratitude to Horticultural Research Station, Dr. YSR Horticultural University, Venkataramannagudem, Andhra Pradesh for providing resources, facilities and support during the course of investigation.

References

Ahmad, S., Khattak A.M., Farooq A, Bibi R., Habib W., Gul G., Asghar M. and Ahmed M. (2024). Effect of Sowing Dates on Lettuce Yield, Grown in Open Field and Partial Shade. *Research Square*.

Ahuja, I., de Vos R.C., Bones A.M. and Hall R.D. (2010). Plant molecular stress responses face climate change. *Trends Plant Sci*., **15(12)**, 664-674.

Ajanya, P., Kale V.S., Sonkamble A.M., Konde N.M. and Rathod T.H. (2023). Effect of Pinching and Different Plant Growth Regulators on Growth, Yield and Quality of Vegetable Cowpea. *Biological Forum – An Int. J*., **15(11)**, 306-312.

Ambroszczyk, A.M., Cebula S. and Sekara A. (2008). The effect of plant pruning on the light conditions and vegetative development of eggplant (*Solanum melongena* L.) in greenhouse cultivation. *Veg. Crops Res Bull*., **68**, 57-70.

Anand, M., Sadasakthi A. and Rohini N. (2017). Standardization

of training and pinching in bottle gourd cv CBgH1 for yield and quality. *Environ. Ecol.*, **35(2)**, 1281-1286.

Bake, I.D., Singh B.K., Singh A.K., Moharana D.P. and Maurya A.K. (2017). Effect of sowing dates and planting distances on quantitative attributes of okra [*Abelmoschus esculentus* (L.) Moench] cv. Kashi Pragati. *The Pharma Innov. J.*, **6(12)**, 142-148.

Choudhary, R., Kushwah S.S., Sharma R.K. and Kachouli B.K. (2020). Effect of Sowing Dates on Growth, Flowering and Yield of Indian Bean Varieties under Agroclimatic conditions of Malwa Plateau in Madhya Pradesh. *Legume Res*., **43(4)**, 539-545.

Compant, S., Van der Heijden M.G.A. and Sessitsch A. (2010). Climate change effects on beneficial plant-microorganism interactions. *FEMS Microbiol. Ecol.*, **73(2)**, 197-214.

Dahal, B., Banjade D., Shrestha A., Khanal D. and Regmi P. (2024). Effects of Pinching on Growth, Yield, and Quality of Watermelon (*Citrullus lanatus*) Varieties in Chitwan, Nepal. *Asian J. Res. Crop Sci.*, **9(2)**, 181-191.

Fagnano, M., Maggio A. and Funagalli I. (2009). Crops responses to ozone in Mediterranean environments. *Environ Pollut.*, **157(5)**, 1438-1444.

Firoz, Z.A., Nasiruddin K.M., Mondal M.F. and Farooq A.M. (2010). Growth and yield of okra as influenced by hill elevation and plant de-detoping in hill slope condition. *Bangladesh J. Agricult. Res.*, **35(2)**, 355-358.

Hoffman, R. (1995). Potent inhibition of breast cancer cell lines by the isoflavonoid Kievitone: Comparison with genistein. *Biochem. Biophy. Res. Commun*., **211**, 600-606.

Joshi, B.K., Shrestha R., Gauchan D. and Shrestha A. (2020). Neglected, underutilized, and future smart crop species in Nepal. *J. Crop Improvement*, **34**, 291-313.

Joshi, S.K. and Rahevar H.D. (2014). Effect of Dates of Sowing, Row Spacings and Varieties on Yield Attributes and Yield of *Rabi* Indian Bean (*Dolichos lablab* L.). *Trends Biosci*., **7(22)**, 3727-3732.

Kharbamon, B., Jha A.K., Verma V.K., Choudhury B.U. and Deka B.C. (2016). Effect of Planting Time and Phosphorus Dosage on Growth, Yield and Quality attributes of Indian bean (*Lablab Purpureus* L.). *Indian J. Hill Farming*, **29(1)**.

Liu, Y.M., Shahed-Al-Mahmud M., Chen X., Chen T.H., Liao K.S., Lo J.M., Wu Y.M., Ho M.C., Wu C.Y., Wong C.H., Jan J.T. and Ma C.A. (2020). Carbohydrate-Binding Protein from the Edible Lablab Beans Effectively Blocks the Infections of Influenza Viruses and SARS-CoV-2. *Cell Rep*., **32(6)**, 108016.

Manikanta, R. Rajappa, Padma M., Neeraja Prabhakar B. and Saidanaik D. (2020). Effect of Growth Regulators and Pruning on Growth and Flowering of Okra (*Abelmoschus esculentus* L. Moench). *Int. J. Curr. Microbiol. App. Sci.*, **9(12)**, 330-343.

Padma, E., Uma Jyothi K., Ramanandam G., Subbaramamma P. and Uma Krishna K. (2020). Effect of Varieties, Dates of Sowing, Growth Regulators and their Interaction on Growth and Yield of Dolichos Bean (*Lablab purpureus* L.) during off Season under Coastal Andhra Pradesh conditions. *Int. J. Curr. Microbiol. App. Sci*., **9(09)**, 933-942.

Pandey, Y.R., Gautam D.M., Thapa R.B., Sharma M.D. and Paudyal K.P. (2012). Response of pole type French bean (*Phaseolus vulgaris* L.) genotypes to sowing dates in the mid hills of western Nepal. *Nepal J. Sci. Technol.*, **13(2)**, 15-20.

Pramoda and Sajjan A.S. (2018). Effect of season and plant growth regulators on crop growth and yield in dolichos bean [*Lablab purpureus* (L.) Sweet]. *Int. J. Pure App. Biosci.*, **6(4)**, 423-430.

Rajewar, S.R. and Patil V.K. (1979). Flowering and fruiting of some important varieties of tomato as affected by spacing, staking and pruning. **1979**, 358-360.

Sawale, R.D., Bhanderi D.R., Tank R.V., Parmar V.K., Desai K.D. and Garde Y.A. (2022). Effect of sowing time and spacing on growth parameters and yield of winter squash (*Cucurbita maxima* D.) cv. Arka Suryamukhi under south Gujarat condition. *Pharm. Innov. Int. J.*, **11**, 2959-62.

Sowmya, P.T., Naruka I.S., Shaktawat R.P.S. and Kushwah S.S. (2017). Effect of sowing dates and stage of pinching on growth, yield and quality of fenugreek (*Trigonella foenum-graecum* L.). *Int. J. Bio-resource Stress Manage.*, **8(1)**, 91-95.