

ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2026): 4.97
IJAFS 2026; 8(10): 758-761
www.agriculturaljournals.com
Received: 12-07-2026
Accepted: 03-09-2026
Published: 17-10-2026

The names and affiliations of all authors are provided below, following the references.

Effect of stacking and jeevamrit on growing behaviour of Betelvine (*Piper betle* L.)

Bhojraj Pradhan[1], Neelima Netam[2], Sevan Das Khunte[3], Anamika Jain Badkul[4], Richa Sao[5], Prakash Kumar Sahu[6], Jitendra Kumar Verma[7], Tarun Kumar Sahu[8], Dipti Neti[9]

DOI: https://www.doi.org/10.33545/2664844X.2026.v8.i10j.2088

Abstract
The experiment entitled "Effect of stacking and jeevamrit on growing behaviour of Betelvine (*Piper betle* L.)" field experiment was conducted during 2025–26 at the Floriculture Research Farm, Sankara under College of Horticulture and Research Station, Sankara-Patan, Durg (C.G.). The design of experiment is FCRD (Factorial Completely Randomized Design) with two factor and three replications. The Factor A have three stacking and the Factor B have different level of jeevamrit spray. The plant is grown in fully shade net condition. The experimental revealed that the highest interaction result found is S_1J_3 (coconut husk stick + jeevamrit @ 15% Spray) with different parameter like highest length of shoots (39.78), vine length at 30, 60, and 90 days, is 33.23 cm, 52.03 cm and 86.63 cm, number nodes per plant (35.35), leaf length (11.77 cm) and leaf breadth (8.47 cm) The results indicate that combination of coconut-husk stick and 15% Jeevamrit was promising batter result and S_0J_0 (bamboo stick + without spray) perform lowest among all.

Keywords: Betelvine, Coconut husk sticks, Stacking, Jeevamrit, Shade net

Introduction

Betelvine (*Piper betle* L.), popularly known as pan, is an important commercial crop in India and is often called the "green gold of India." India ranks as the world's leading producer of betel leaves (Kumar *et al*., 2023) [1]. More than 20 million people in India consume betel leaves regularly (Pandey *et al*., 2018) [2], and when global consumption is considered, the total number of users is estimated to exceed 2 billion (Biswas *et al*., 2022) [3]. Globally, around 100 varieties of betel vine exist, of which nearly 40 are found in India and about 30 in West Bengal alone (Guha *et al*., 1997) [4].

In addition to India, betel vine is cultivated in countries such as Nepal, Sri Lanka, and Burma. Betelvine is a perennial, evergreen, and aromatic creeping plant belonging to the dicot family Piperaceae. The crop is believed to have originated in Malaysia. It thrives in tropical and subtropical agro-climatic conditions. Although the species is dioecious, male plants are predominantly cultivated for commercial production. Betel vine is known by various names across different regions and languages of India, such as Pan, Tambool, Vakshapatra, Sompatra, Tamalapaku, Voojangalata, Saptaseera, and Nagaballi (Guha, 2006) [5]. Betel leaves are primarily used as a mouth freshener and are also widely recognized for their medicinal and Nutritional properties. They help treat various communicable and non-communicable conditions such as colds, coughs, bronchial asthma, rheumatism, and stomach pain. Additionally, they are used for issues like bad breath, boils, abscesses, conjunctivitis, constipation, gum swelling, and minor cuts or injuries. (Gundala *et al.,* 2014) [6]. Studies have also shown that betel exhibits notable *anti*-proliferative effects in both in vitro and in vivo models of prostate cancer. (Paranjpe *et al.,* 2013) [7].

Material and methods

The experiment entitled "Effect of stacking and jeevamrit on growing behaviour of Betelvine (*Piper betle* L.)" field experiment was conducted during 2025–26 at the Floriculture Research Farm, Sankara under College of Horticulture and Research Station, Sankara-Patan, Durg (C.G.).

The experiment was laid out in Factorial Completely Randomized Design (FCRD) with two factors, factorial arrangement having three replications. The Factor A have three stacking techniques, Bamboo sticks (S_0), Coconut husk sticks (S_1) and Paddy straw sticks (S_2). (*Note - coconut husk is wrapped with bamboo stick and paddy straw wrapped with bamboo stick). Factor B have different level of jeevamrit spray, without spray (control) (J_0), Jeevamrit @ 5% (J_1), Jeevamrit @ 10% (J_2) and Jeevamrit @ 15% (J_3) foliar spray. With 12 treatment combination.

For planting selecting the healthy and disease-free plant and transplanting in direct in field. The field are set the fully shade net condition. The different sticks are used in per plant for stacking and spray jeevamrit at 15,

Corresponding Author:
Bhojraj Pradhan
M.Sc. (Hort.), Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India

26648458, 2026, 8(10), Downloaded from https://www.doi.org/10.33545/2664844X.2026.v8.i10j.2088 by International Journal of Agriculture and Food Science on [17/10/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License

30 and 45 days after planting at the different doses. We provide proper moisture both soil and sticks for better moisture. The observation is recorded in vine length at 30, 60, and 90 DAP and other parameter like length of shoots, number of nodes per plant, leaf length and leaf breadth is observed 100 DAP.

Result and discussion

Growth parameter

1. **Length of shoots (cm)**

Effect of stacking: Among the stacking treatments, S_1 (coconut husk sticks) recorded the maximum shoot length (34.91 cm), while S_0 (bamboo sticks) recorded the minimum (32.62 cm).

Effect of Jeevamrit: Among the jeevamrit treatments, J_3 (15% spray) recorded the maximum shoot length (36.92 cm), whereas J_0 (control, without spray) recorded the minimum (31.91 cm).

Interaction effect: The combination S_1J_3 (coconut husk sticks + 15% Jeevamrit spray) recorded the maximum shoot length (39.78 cm), while S_0J_0 (bamboo sticks + without spray) recorded the minimum (29.65 cm). The better performance of S_1J_3 may be attributed to improved support and favourable growing conditions. Similar observations were made by other workers, such as Kakade *et al.* (2019) [8] and Dawar *et al.* (2020) [9].

2. **Vine length (cm)**

Effect of stacking: S_1 (coconut husk sticks) recorded the maximum vine length at 30, 60 and 90 DAP (30.68, 48.80 and 82.61 cm), while S_0 (bamboo sticks) recorded the minimum (26.80, 46.45 and 77.97 cm).

Effect of Jeevamrit spray: J_3 (15% Jeevamrit spray) recorded the maximum vine length (31.79, 50.10 and 84.22 cm) at 30, 60 and 90 DAP, whereas J_0 (control, without spray) recorded the minimum (26.70, 45.58 and 77.65 cm).

Interaction effect: The combination S_1J_3 (coconut husk sticks + 15% Jeevamrit spray) recorded the maximum vine length (33.23, 52.03 and 86.63 cm) at 30, 60 and 90 DAP. The minimum values (24.77, 44.96 and 74.15 cm) were recorded under S_0J_0 (bamboo sticks + without spray).

3. **Number of nodes per plant**

Effect of Stacking: The maximum number of nodes per plant (29.85) at 100 DAP was recorded with (S_1) coconut husk sticks, while the minimum (21.81) was observed with S_0 – Bamboo sticks.
Effect of Jeevamrit Spray: The maximum number of nodes per plant (31.19) was recorded with jeevamrit spray at 15%, whereas the minimum (22.23) was observed in the control (without spray).
Interaction Effect: The maximum number of nodes per plant (35.35) was recorded under S_1J_3, while the minimum (17.47) was observed under S_0J_0. Similar findings were reported by Mahalakshmi *et al.* (2019) [10] in betelvine.

Quality parameter

1. **Leaf length (cm)**

Effect of Stacking: The maximum leaf length (10.07 cm) was recorded with (S_1) coconut husk sticks, while the minimum (8.32 cm) was observed with (S_0) bamboo sticks.

Effect of Jeevamrit Spray: The maximum leaf length (10.47 cm) was recorded with (J_3) jeevamrit spray at 15%, whereas the minimum (8.75 cm) was observed in the control (J_0) without spray.

Interaction Effect: The maximum leaf length (11.77 cm) was recorded under S_1J_3 (coconut husk sticks + 15% Jeevamrit), while the minimum (7.51 cm) was observed under S_0J_0 (bamboo sticks + without spray).

2. **Leaf breadth (cm)**

Effect of Stacking: The maximum leaf breadth (7.89 cm) was recorded with (S_2) paddy straw sticks, while the minimum (6.55 cm) was observed with (S_0) bamboo sticks.
Effect of Jeevamrit Spray: The maximum leaf breadth (7.85 cm) was recorded with (J_3) jeevamrit spray at 15%, whereas the minimum (6.64 cm) was observed in the control (J_0) without spray.
Interaction Effect: The maximum leaf breadth (8.47 cm) was recorded under S_1J_3 (coconut husk sticks + 15% Jeevamrit), while the minimum (5.93 cm) was observed under S_0J_0 (bamboo sticks + without spray). Similar findings were reported by Mahalakshmi *et al.* (2019) [10], Sahu *et al.* (2026) [11], and Umesha *et al.* (2011) [12].

Table 1. Effect of stacking technique and jeevamrit Spray on growth parameter of Betelvine.

Treatment details	length of shoots (cm)	Vine length (cm)			Number of nodes per plant	Leaf length(cm)	Leaf breadth (cm)
		30 DAP	60 DAP	90 DAP			
Factor A - Stacking							
S_0 - Bamboo sticks	32.62	26.80	46.45	77.97	21.81	8.32	6.55
S_1 - Coconut husk sticks	34.91	30.68	48.80	82.61	29.85	10.07	7.60
S_2 - Paddy straw sticks	33.99	29.83	47.36	81.62	28.75	9.93	7.89
SEm (±)	0.401	0.303	0.231	0.260	0.243	0.091	0.078
CD (5%)	1.1701	0.8834	0.6737	0.7593	0.7105	0.2649	0.2290
Factor B - Jeevamrit spray							
J_0- Without spray (control)	31.91	26.70	45.58	77.65	22.23	8.75	6.64
J_1- Jeevamrit @ 5%	33.18	28.04	46.32	79.51	25.61	9.04	7.18
J_2- Jeevamrit @ 10%	33.34	29.88	48.13	81.56	28.18	9.50	7.72
J_3 - Jeevamrit @ 15%	36.92	31.79	50.10	84.22	31.19	10.47	7.85
SEm (±)	0.463	0.349	0.267	0.300	0.281	0.105	0.091
CD (5%)	1.3511	1.0200	0.000	0.8767	0.8204	0.3058	6.64
Treatments							
S_0J_0	29.65	24.77	44.96	74.15	17.47	7.51	5.93
S_0J_1	34.95	25.38	45.91	77.11	20.47	8.11	6.48
S_0J_2	31.18	26.96	46.72	78.69	23.04	8.60	7.02

(continued on next page)

26648458, 2026, 8(10), Downloaded from https://www.doi.org/10.33545/26648458.2026.v8.i10j.2088 by International Journal of Agriculture and Food Science on [17/10/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License

Treatment details	length of shoots (cm)	Vine length (cm)			Number of nodes per plant	Leaf length(cm)	Leaf breadth (cm)
		30 DAP	60 DAP	90 DAP			
S_0J_3	34.68	30.11	48.18	81.93	26.28	9.07	6.79
S_1J_0	32.51	26.85	45.76	78.58	24.49	9.30	6.55
S_1J_1	33.05	30.71	47.85	81.66	28.47	9.28	7.45
S_1J_2	34.28	31.93	49.55	83.56	31.09	9.93	7.92
S_1J_3	39.78	33.23	52.03	86.63	35.35	11.77	8.47
S_2J_0	33.56	28.48	46.03	80.21	24.74	9.44	7.45
S_2J_1	31.54	28.05	45.19	79.78	27.90	9.74	7.62
S_2J_2	34.55	30.76	48.12	82.42	30.42	9.97	8.23
S_2J_3	36.28	32.03	50.09	84.08	31.94	10.56	8.28
SEm (±)	0.802	0.605	0.462	0.520	0.487	0.181	0.157
CD (5%)	2.3403	1.7667	1.3474	1.5185	1.4209	0.5297	0.4580



Figure 1. Interaction effect between Stacking and jeevamrit on Length of shoots

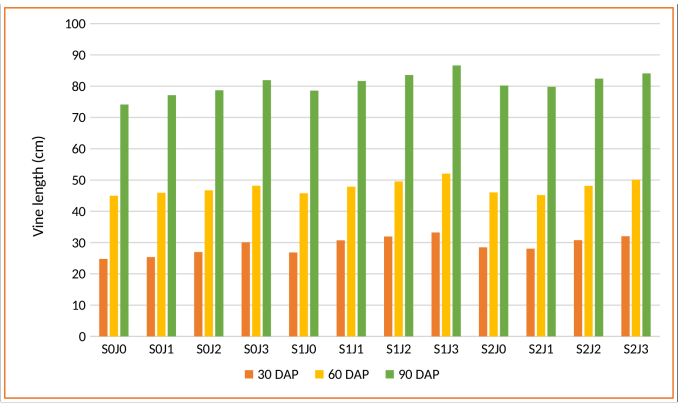


Figure 2. Interaction effect between Stacking and jeevamrit on Vine length

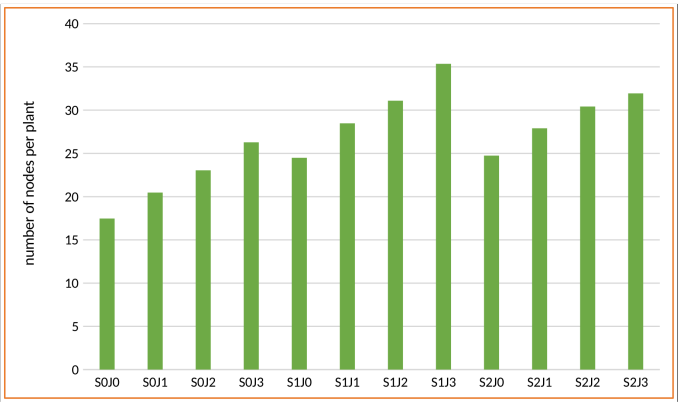


Figure 3. Interaction effect between Stacking and jeevamrit on number of nodes per plant

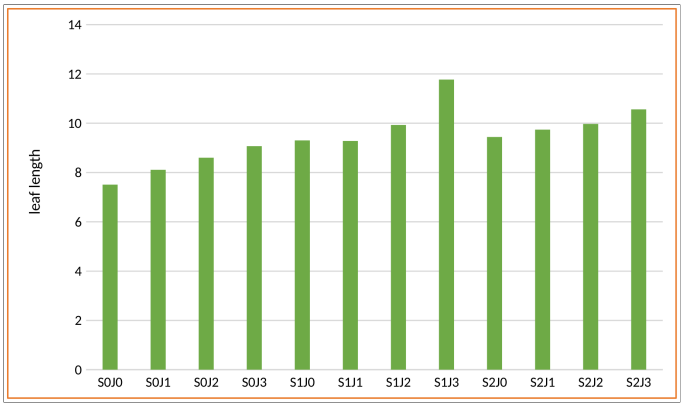


Figure 4. Interaction effect between Stacking and jeevamrit on leaf length

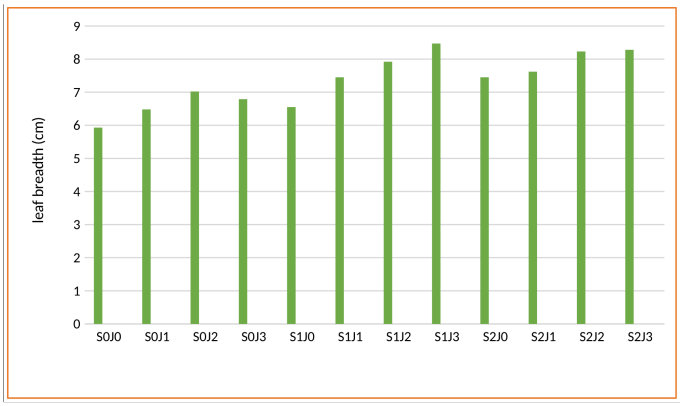


Figure 5. Interaction effect between Stacking and jeevamrit on leaf breadth

Conclusion

The present investigation revealed that stacking and jeevamrit spray influenced the growth of betelvine under shade net conditions. Among the different treatment combinations, S_1J_3 (coconut husk sticks + 15% jeevamrit spray) recorded the best performance in terms of shoot length (39.78 cm), vine length at 90 DAP (86.63 cm), number of nodes per plant (35.35), leaf length (11.77 cm) and leaf breadth (8.47 cm) In contrast, S_0J_0 (bamboo sticks without Jeevamrit spray) generally recorded the lowest values. Therefore, the combination of coconut husk sticks and 15% Jeevamrit spray was found to be the most promising treatment for improving the growth of betelvine under the conditions of the present study.

26648458, 2026, 8(10), Downloaded from https://www.doi.org/10.33545/2664844X.2026.v8.i10j.2088 by International Journal of Agriculture and Food Science on [17/10/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License

Acknowledgement

Express my sincere gratitude to my Major Advisor, Mrs. Neelima Netam (Assistant Professor, Department of Floriculture and Landscaping), for her valuable guidance and support throughout my research work. I am thankful to the Head of the Department and all faculty members for their cooperation and encouragement. I would also like to thank my friends Prakash, Jitendra sir, Priyanshu Dipti, Laxmi, Deepika, Tarun, Kunj, Deepti, Kavita, Ashish, Vivek, Manish and my Parent for their constant support and motivation.

References

1. Kumar A, Yadav SK, Jangid R, Gupta AK, Kumar A, Kumar D, Shankar K. Challenges and economic feasibility of betelvine cultivation in Uttar Pradesh. Inter. J. Econ. Plants. 2023;10:160-169.
2. Pandey AK, Das S, Kumar P. Various method for minimizing post-harvest losses of betelvine leaves (*Piper betle* L.). Inter. J. Curr. Microbiol. Appl. Sci. 2018;7:1037-1043.
3. Biswas P, Anand U, Chatterjee Saha S, Kant N, Mishra T, Masih H, Bar A, Pandey DK, Jha NK, Majumder M, Das N, Gadekar VS, Shekhawat MS, Kumar M, Radha Proaeków J, Pérez de la Lastra JM, Dey A. Betelvine (*Piper betle* L.): A comprehensive insight into its ethnopharmacology, phytochemistry, and pharmacological, biomedical and therapeutic attributes. J. Cellu. Molec. Med. 2022;26:3083–3119.
4. Guha P, Jain RK. Status report on production, processing and marketing of betel leaf (*Piper betle* L.). Agriculture and Food Engineering Department, IIT, Kharagpur, India. 1997:15-22.
5. Guha P. Betel leaf: the neglected green gold of India. J. Human Ecol. 2006;19:87-93.
6. Gundala SR, Yang C, Mukkavilli R, Paranjpe R, Brahmbhatt M, Pannu V, Aneja R. Hydroxychavicol, a betel leaf component, inhibits prostate cancer through ROS-driven DNA damage andapoptosis. Toxicology and applied Pharmacology. 2014;280(1):86-96.
7. Paranjpe R, Gundala SR, Lakshminarayana N, Sagwal A, Asif G, Pandey A, Aneja R. *Piper betel* leaf extract: anticancer benefits and bioguided fractionation to identify active principles for prostate cancer management. Carcinogenesis. 2013;34(7):1558-1566.
8. Kakade V, Dinesh D, Singh D, Bhatnagar PR, Kadam D. Influence of length of cutting on root and shoot growth in dragon fruit (*Hylocereus undatus*). Indian Journal of Agricultural Sciences. 2019;89(11):1895–1899.
9. Dawar IS, Sharma TR, Nagar OP, Pa S. Effect of different rooting media for rooting success and survivability of marcottage in pomegranate (*Punica granatum* L.) C.V. Bhagwa. Int. J. Curr. Microbiol. App. Sci. 2020;9(12):1858–1867.
10. Mahalakshmi M, Chitra R, Jansi Rani P, Janaki D. Effect of organic manures and nutrients on growth and yield of betelvine (*Piper betle* L.). Int J Chem Stud. 2019;7(3):288-291.
11. Sahu PK, Khunte SD, Dixit A, Dhruw SS, Sao R, Pradhan B. Effect of different media composition on rooting and growth parameters of betelvine (*Piper betle* L.) cuttings in Durg district of Chhattisgarh. International Journal of Advanced Biochemistry Research. 2026;10(2S):527–530.
12. Umesha K, Soumya SP, Smitha GR, Sreeramu BS. Influence of organic manures on growth, yield and quality of makoi (*Solanum nigrum* L.). Indian Journal of Horticulture. 2011;68(2):235-239.

How to cite this article: Pradhan B, Netam N, Khunte SD, Badkul AJ, Sao R, Sahu PK, et al. Effect of stacking and jeevamrit on growing behaviour of Betelvine (*Piper betle* L.). *International Journal of Agriculture and Food Science*. 2026;8(10):758-761. doi: https://www.doi.org/10.33545/2664844X.2026.v8.i10j.2088

Authors

Bhojraj Pradhan
M.Sc. (Hort.), Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Neelima Netam
Assistant Professor, Department of Floriculture and Landscaping, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Sevan Das Khunte
Assistant Professor, Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Anamika Jain Badkul
Assistant Professor, Department of Agronomy, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Richa Sao
Assistant Professor, Department of Genetics and Plant Breeding, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Prakash Kumar Sahu
M.Sc. Scholar, Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Jitendra Kumar Verma
Assistant Professor, Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Tarun Kumar Sahu
M.Sc. (Hort.), Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India
Dipti Neti
M.Sc. Scholar, Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India

26648458, 2026, 8(10), Downloaded from https://www.doi.org/10.33545/2664844X.2026.v8.i10j.2088 by International Journal of Agriculture and Food Science on [17/10/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License