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An Overview of Tea Cultivation Practices and Their Climatic Adaptations

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Tea (*Camellia sinensis*) is a globally significant beverage crop cultivated mainly in tropical and subtropical regions. Its successful cultivation requires specific climatic conditions including optimal temperature and rainfall. The propagation is done through vegetative cuttings or seeds, with careful planting and post-planting care to ensure healthy growth. Weed control is primarily manual due to organic practices, and structured pruning maintains plant vigour and yield. Nutrient management with organic manures and shade tree planting are essential. Standard plucking practices ensure high-quality tea production, sustaining its economic importance worldwide.

Key words: Tea cultivation, Propagation practice, pruning management and plucking practice.

Introduction

Tea (*Camellia sinensis*) is one of the most widely consumed beverages globally, second only to water, and holds significant economic, cultural and health value (Ahmed *et al.*, 2014; Xia *et al.*, 2020). It is cultivated in over 50 countries, predominantly in the tropics and subtropics, under specific agro-climatic conditions (Hajiboland, 2017; Aditya *et al.*, 2023). The tea industry is a major economic contributor in several countries, particularly in Asia and Africa, where it supports millions of livelihoods (Batool *et al.*, 2022). The increasing global demand for tea, driven by its health benefits and cultural significance, underscores the importance of optimizing tea cultivation practices to meet both quality and quantity requirements (Huang and Chen, 2024). Tea, originating in China over 5,000 years ago, has become a globally significant beverage with a rich history and growing scientific interest (Commins, 2008; Arab & Blumberg, 2003). India holds a prominent position in global tea production, ranking as the second-largest producer after China (Das & Zirmire, 2018; Laskar & Thappa, 2018). Assam alone produces more than 52 percent of the national production. The tea produce in Assam are among the finest across the globe. The climate of the region helps in producing tasty tea. In this context, a details analytical study of factors affecting tea production in Assam has been undertaken. Factor analysis was carried out to get the reduced number of variables which affect tea production in Assam (Laskar & Thappa, 2018).

Climate Requirement

Tea plants are highly sensitive to climatic conditions, which significantly influence their growth, yield and quality. Optimal tea cultivation requires specific temperature ranges, rainfall patterns and overall climate conditions. The various studies have shown that tea yield increases with elevated CO_2 levels, but this increment can be substantially affected by rising temperatures and uneven rainfall patterns (Jayasinghe and Kumar, 2021). High temperatures

can lead to stress conditions, reducing the quality and yield of tea leaves. Conversely, moderate temperatures with ample cloud cover and fog, as observed in high mountainous regions of Therefore, understanding and adapting to the climatic requirements of tea plants is essential for sustainable tea production.

Tea Cultivation Practices

Propagation

- **Vegetative propagation** is common, involving selection of healthy mother bushes, preparation of semi-mature stem cuttings ("scions"), rooting under polythene tents and hardening before field planting (Singh, 2005).
- **Seed propagation** is also used, with nurseries established at suitable sites having sandy loam soil (pH 4.5–5.8). Seedlings are ready for field planting in 12–18 months (Singh, 2005).

Planting

- Ideal from March to October (excluding mid-May to mid-June).
- Spacing varies with elevation; pits are dug 45 cm deep, mixed with fertilizers, and plants are set 1 cm below ground level.

Post-planting care

- Includes spraying copper oxychloride (COC) in organic plantations, sowing green manure crops, mulching, and prompt gap filling to ensure uniform stand (Singh, 2005).

Weed control

- Mainly through hand weeding, cheeling, fork tilling, and sickling as herbicide use is restricted due to organic cultivation practices.

Pruning and skiffing

- Pruning cycles (5–7 years) involve collar prune, rejuvenation prune, medium prune, light prune, and skiffing types to maintain bush health and productivity (Kumar *et al.*, 2018).

Nutrition and shade management

- Organic manures (certified by APEDA) are preferred. Shade trees like *Indigofera teysmanii*, *Albizia chinensis*, and *Grevillea robusta* are planted for protection against intense UV radiation (Durairaj *et al.*, 2015).

Plucking

- Begins 2–3 years post-planting; follows the "two leaves and a bud" standard to ensure quality (Singh, 2005). Bhanji removal (breaking dormant shoots) is done manually during April–June to promote monsoon flush.

Conclusion

Tea (*Camellia sinensis*) remains one of the most significant plantations crops globally, with profound economic, cultural and health relevance. Its cultivation is highly climate-sensitive, requiring optimal temperature, rainfall and humidity conditions to achieve both yield and quality standards. The effective tea cultivation necessitates a comprehensive understanding and implementation of scientific practices. Vegetative propagation through clonal cuttings ensures uniformity and productivity, while seed propagation remains important for genetic diversity. Timely planting, precise spacing, and meticulous post-planting care, including organic plant protection measures, are integral to establishing healthy plantations. Weed management through manual and mechanical means, along with structured pruning and skiffing cycles, maintains plant vigour and enhances yield sustainability. The nutrient management using organic inputs and incorporation of appropriate shade tree species safeguards tea plants against climatic extremes and ensures soil fertility. The practice of standard plucking, adhering to the "two leaves and a bud" norm, ensures high-quality leaf harvests, crucial for market competitiveness. As global demand continues to rise, integrating climate-resilient strategies and optimal agronomic practices will be vital for ensuring sustainable and profitable tea cultivation while preserving its ecological and economic contributions across tea-growing regions.

References

1. Aditya K., Kumar R., Bharti, and Sanyal S., 2023, Environmental impact of greenhouse gas emissions from the tea industries of northeastern states of India, Frontiers in Sustainable Food Systems, 7: 1220775.
2. Ahmed S., Stepp J.R., Orians C., Griffin T., Matyas C., Robbat A., Cash S., Xue D., Long C., Unachukwu U., Buckley S., Small D., and Kennelly E., 2014, Effects of extreme climate events on tea (Camellia sinensis) functional quality validate indigenous farmer knowledge and sensory preferences in tropical China, PloS One, 9(10): e109126.
3. Arab, L., & Blumberg, J. B. (2008). Introduction to the Proceedings of the Fourth International Scientific Symposium on Tea and Human Health1. *The Journal of Nutrition*, *138*(8), 1526S-1528S.
4. Batool D., Shahbaz M., Asif H., Shaukat K., Alam T., Hameed I., Ramzan Z., Waheed A., Aljuaid H., and Luo S., 2022, A hybrid approach to tea crop yield prediction using simulation models and machine learning, Plants, 11(15): 1925.
5. Commins, T., & Sampanvejsobha, S. (2008). Development of the tea industry in Thailand. *Asian J Food Agric Ind*, *1*(01), 1-16.
6. Das, P., & Zirmire, J. (2018). Tea Industry in India: Current trends and future prospective. *J Pharmacogn Phytochem*, *7*(1), 407-409.
7. Durairaj J., Radhakrishnan B,. Hudson J.B. and Muraleedharan N. (2015) Guidelines on tea culture in South India, UPASI, Coonoor, Tamil Nadu.
8. Hajiboland R., 2017, Environmental and nutritional requirements for tea cultivation, Folia Horticulturae, 29(2): 199-220
9. Jayasinghe S.L., and Kumar L., 2021, Potential impact of the current and future climate on the yield, quality, and climate suitability for tea [Camellia sinensis (L.) O. Kuntze]: A systematic review, Agronomy, 11(4): 619.
10. Kumar R. (2018). An introduction to cultivation of Darjeeling tea (Camellia sinensis L.). Journal of Fmg. & Mngmt. 3 (1): 66-79.
11. Laskar, N., & Thappa, S. (2018). An analytical study on influencing factors of tea production in Assam. *International Journal of Scientific and Research Publications (IJSPR)*, *8*(7).
12. Singh, I D. (2005). The planter‟s Guide to tea culture and manufacture. N.B. Modern Agencies, Siliguri, West Bengal.
13. Xia E., Tong W., Wu Q., Wei S., Zhao J., Zhang Z., Wei C., and Wan X., 2020, Tea plant genomics: Achievements, challenges and perspectives, Horticulture Research, 7: 1-13.