



Grape Production Technology in Anantapuramu District: A Profitable Horticultural Enterprise

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ABSTRACT

Grape (*Vitis vinifera* L.) is an economically important fruit crop with immense potential for cultivation in the semi-arid region of Anantapuramu district, Andhra Pradesh. The district's warm climate, abundant sunshine, low humidity and well-drained red soils provide favorable conditions for the production of high-quality grapes. Adoption of improved production technologies, including the cultivation of suitable varieties, scientific vineyard establishment, balanced nutrient management, drip irrigation, canopy management and timely pruning, significantly enhances productivity and fruit quality. Integrated pest and disease management further ensures sustainable grape production. In addition to fresh consumption, grapes can be processed into raisins, juice and other value-added products, providing higher economic returns to farmers. The dry climatic conditions of Anantapuramu are particularly suitable for raisin production and solar drying, which minimize post-harvest losses and improve marketability. Therefore, integrating scientific production practices with value addition can substantially increase farmer income, resource-use efficiency and the sustainability of grape cultivation in the region.

Keywords: Grape Cultivation, Drip Irrigation, Solar Drying, Value Addition, Semi-Arid Horticulture

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1. INTRODUCTION

Grape (*Vitis vinifera* L.) is one of the most important commercial fruit crops grown in India and has considerable potential in the semi-arid regions of Andhra Pradesh. In Anantapuramu district, increasing adoption of drip irrigation, fertigation and improved vineyard management practices has encouraged farmers to cultivate grapes as a high-value horticultural crop. The fruit is rich in natural sugars, vitamins, minerals, antioxidants and polyphenols, making it popular among consumers for fresh consumption as well as processing into raisins, juice and wine. The warm climate, low humidity and abundant sunshine available in the district are favorable for producing sweet berries with good color and quality (NHB, 2023).

2. CLIMATE AND SOIL REQUIREMENTS

Grapes perform well under warm and dry climatic conditions with a long sunny period during berry development. The crop grows successfully in areas receiving annual rainfall of 500–700 mm and temperatures ranging from 15–35°C. Anantapuramu's hot summers, low humidity and prolonged sunshine favors better fruit sweetness and reduce fungal disease incidence. Deep, well-drained sandy loam to red loam soils with a pH of 6.5–8.0 are ideal for vineyard establishment, while waterlogged soils should be avoided as they adversely affect root growth and vine vigour (Reddy and Kumar, 2021).

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3. SUITABLE VARIETIES

Among the grape varieties cultivated in southern India, Thompson Seedless is the most popular due to its high yield, seedless berries and suitability for raisin making. Other varieties such as Sharad Seedless, Flame Seedless and Bangalore Blue are also cultivated depending on market preference and climatic adaptability. Thompson Seedless and Sharad Seedless are particularly suitable for irrigated conditions of Rayalaseema because of their good fruit quality and market demand.

4. PLANTING AND VINEYARD ESTABLISHMENT

Healthy rooted cuttings or grafted plants should be planted during June–July or January–February under irrigated conditions. Pits of $60 \times 60 \times 60$ cm are filled with topsoil, 20–25 kg farmyard manure, neem cake and basal fertilizers before planting. A spacing of 3×2 m or 3×1.8 m is commonly adopted, accommodating about 1,600–1,850 vines per hectare. Proper vineyard establishment and initial training are essential for obtaining uniform growth and higher productivity. (Shikhamany and Manjunath, 2019).

5. NUTRIENT MANAGEMENT

Balanced nutrition is essential for maintaining vine vigour, berry size and yield. For a bearing vineyard, application of 20–25 kg farmyard manure, 500–600 g nitrogen, 250–300 g phosphorus and 500–600 g potassium per vine annually is generally recommended. Nitrogen and potassium should be applied in split doses through drip fertigation, while phosphorus may be applied basally. Drip fertigation improves nutrient-use efficiency, root activity and yield under the water-limited conditions of Anantapuramu (NHB, 2023).

6. IRRIGATION SCHEDULING

Although grapes are moderately drought tolerant, regular irrigation is necessary for optimum yield and berry quality. Drip irrigation is the most efficient method under semi-arid conditions. Water requirement varies with season and crop stage, with mature vines requiring about 20–25 L/day during winter and 40–60 L/day during summer and berry development. Irrigation at 5–7 day intervals during summer and 10–12 day intervals during cooler months is generally adequate. Excess irrigation should be avoided as it can lead to poor berry quality, cracking and disease incidence. (NRAA, 2020).

7. TRAINING AND PRUNING

Training and pruning are critical operations in grape production. The bower (pergola) system is widely adopted in South India because it provides better canopy spread and higher yields. Annual pruning is carried out after harvest to regulate shoot growth and fruiting. Removal of weak, diseased and overcrowded shoots improves sunlight penetration, aeration and bunch quality. Proper pruning also helps in obtaining uniform berry development and better marketable yield.

8. PEST AND DISEASE MANAGEMENT

Grapes are affected by several pests and diseases if vineyards are not managed properly. Mealy bugs, thrips, flea beetles and stem borers are common insect pests, while powdery mildew, downy mildew, anthracnose and bacterial leaf spot are important diseases. Powdery mildew appears as white powdery growth on leaves and berries, whereas downy mildew causes yellow patches and leaf blight under humid conditions. Adoption of orchard sanitation, canopy management, timely pruning and need-based plant protection measures are essential for minimizing losses and maintaining fruit quality (TNAU, 2024).

9. HARVESTING AND YIELD

Harvesting is done when berries attain full size, characteristic colour and optimum sweetness. Bunches should be harvested carefully to avoid berry damage and loss of bloom. Under good management, commercial yields of 20–30 tonnes per hectare can be obtained from mature vineyards in the irrigated tracts of Rayalaseema. Proper grading, packing and cold-chain handling improve market value and shelf life.

10. MARKETING AND VALUE ADDITION

Fresh grapes are marketed through local markets, wholesale yards and retail chains. Surplus produce can be processed into raisins, juice, squash and wine, which provide additional income opportunities. The dry climate of Anantapuramu is particularly favorable for raisin making due to faster moisture removal and reduced fungal contamination. Adoption of solar or mechanical drying can further improve product quality and reduce post-harvest losses.

11. CONCLUSION

Grape cultivation is emerging as a profitable horticultural enterprise in Anantapuramu district due to the region's favorable climate and increasing adoption of drip irrigation and fertigation. Scientific vineyard management, balanced nutrition and timely pruning can significantly improve yield and fruit quality. Integration of grape production with value addition through raisin making and solar drying can enhance farmer income and promote sustainable horticultural development in the Rayalaseema region.

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