

OPTIMIZING PIT DIMENSIONS FOR RUBBER PLANTING IN TRIPURA: A COST EFFECTIVE APPROACH

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A twelve-year study (2011-2022) was conducted at Taranagar Farm, Regional Research Station of the Rubber Research Institute of India, Agartala (23° 50' N, 91° 25' E), to evaluate the impact of planting pit sizes on root development and growth of *Hevea brasiliensis*. The experimental site, characterized by red loam and sandy loam soil with a depth exceeding one meter facilitated the investigation with three pit dimensions: 75 x 75 x 75 cm (standard LxWxD), 60 cm depth x 30 cm diameter (for polybag plants), and 45 cm depth x 20 cm diameter (for root trainer plants). Results indicated that pit size variation had no significant effect on the development of tap or lateral roots, nor on overall plant growth and yield. Economically, smaller pits reduced the planting cost by 59.6 per cent and 79.8 per cent for polybag and root trainer plants, respectively, compared to the standard pit size. The study concluded that using smaller pits is cost-effective without compromising on plant development, provided planting is timed with the onset of the monsoon season to allow adequate root establishment before winter.

Keywords: Cost effective, *Hevea brasiliensis*, Pit size, Planting pit, Root distribution

INTRODUCTION

In the dynamic agricultural panorama of Tripura, India, the rubber cultivation sector has undergone a notable expansion, positioning the state as the second-largest rubber-producer in the country after Kerala. The fundamental elements that influence rubber cultivation are rainfall, temperature, sunshine, relative humidity and wind (Varghese and Vanitha, 2018). Despite being a non-traditional rubber cultivation zone, Tripura has successfully overcome those inherent soil and climatic challenges, exemplified by a remarkable surge in rubber

plantation acreage. Presently, over 90,000 hectares in the state are dedicated to rubber cultivation, constituting nearly nine per cent of the total land area, which is a significant transformation from the meager 700 hectares observed in the mid-1970s.

The metamorphosis of rubber plantations in Tripura is particularly noteworthy when viewed against historical benchmarks. Growth of rubber trees, characterized by a well-developed tap root and lateral root system, plays a pivotal role in enhancing absorption capacity for both moisture and nutrients. This phenomenon has been