Conference Paper Volume 2641, Issue 1 Journal of Physics: Conference Series pages 1 – 9

Nutrient Requirements and Growth Response of Harumanis Mango (Mangiferaindica L.) during Vegetative Shoot Growth Stages: A Mitscherlich Law Analysis

Abstract

This study investigates the nutrient requirements of Harumanis mango (Mangifera indica L) during different vegetative shoot growth stages by analyzing the soil nutrient test value-relative growth relationships. The research utilizes the Mitscherlich Law to model the response of mango yield in relation to varying nutrient levels. The data came from experimental plots, and the results show the asymptotic behavior of mango yield for three essential nutrients: nitrogen (N), phosphorus (P), and potassium (K). For vegetative shoot growth1, the asymptotic yield was estimated at 665.5 with a decline rate of -3.39 concerning N, -2.17 concerning P, and -1.35 concerning K. The coefficient of determination (R2) was 0.934, indicating a high goodness of fit for the model. Similar trends were observed for vegetative shoot growth2 and 3, where the asymptotic yields and nutrient decline rates varied accordingly. This study provides crucial insights into Harumanis mango nutrient needs across growth stages, aiding orchard management for sustainable yields. Applying the Mitscherlich Law enhances our understanding of how nutrients affect mango growth. These findings support targeted fertilization, boosting productivity and orchard efficiency. Future research can explore more growth factors and long-term nutrient impacts.