Abstract

In order to predict the requirements of K in habanero pepper (Capsicum chinense Jacq) in fifteen soils of Yucatán, according to their potential to supply this nutrient, and the ability of the root to absorb it, a simulation model, Soil Supply and Nutrient Demand (SSAND) was used. SSAND is a mechanistic approach that simulates crop development to diagnose limitations of nutrition and to determine the nutrient requirements in order to reach the production goals. The model is based on the theories of diffusion and mass flow of nutrients in the soil, on root characteristics, and on the kinetics of nutrient absorption. According to the proposed production of 28 t ha\(^{-1}\) of fresh fruit, the model results showed that the soils required an application of 108 to 150 kg ha\(^{-1}\) of K, depending on the soil type. The opportune time of application was fundamental for the plant to absorb the nutrient and take advantage of the application. Some soils required that most of the K be applied during the first 40 days of plant development; in contrast, for the other soils, the model suggested that the incorporation of K be carried out during the whole cycle of cultivation (160 days). The differences in time of application are attributed to the soil characteristics of incorporated K retention, to their capacity for releasing it to the soil solution, and making it available to the plant for absorption.

Keywords

Nutrient demand, fertilization, simulation.