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Sustainable Mango Production in a Mountain Region in China

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Abstract

Mango (*Mangifera indica* L.) is one of the most important fruit trees worldwide cultivated at both tropical and subtropical latitudes, mainly in Asia. China is among the 3 major mango producing countries. There exist several hundred mango cultivars that differ in tree size, fruit characteristics, fruiting season, disease tolerance, and also regarding their optimum range of environmental conditions. In mountainous regions, where elevation ranges result in a variety of environmental gradients (e.g., temperatures, soil moisture, light intensity), it is crucial to find the optimum mango cultivar for a certain elevation range.

Here we present the background, goal and progress of our recently started project. The study site is in Honghe, located in the southwest of China with a mountainous topography. Mango is one major crop in this region and is grown at elevations between 400 m and 1200 m. However, there exist no evidence-based recommendations for the optimum elevation of the different varieties grown in this region. We planted 2-year old seedlings of the main 9 mango varieties in 2018 in 5 plots along an elevational gradient (400 m to 1100 m), with 3 replicates at each elevation. In each plot, there are subplots to compare different management strategies: 1) a control with common fertilisation practice, 2) a 75 % fertilisation treatment in order to analyse impact of reduced fertilisation on mango yield and soil parameters, and 3) an agroforestry trial with 4 intercropping species.

Our research will examine the impact of elevation and different management (different fertilisation rates, and intercropping) on mango phenology, yield, and ecosystem services (soil erosion, abundance and diversity of soil microorganisms, greenhouse gas emissions). A proposed output will be a recommendation for mango varieties and management according to elevation and soil type in that region.

Keywords: Elevation gradient, fertilisation, mango varieties, soil health

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