

A REVIEW OF COFFEE NUTRITION RESEARCH IN PAPUA NEW GUINEA

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ABSTRACT

Research on coffee nutrition conducted in Papua New Guinea between 1954 to 1998 is reviewed and deals with arabica coffee with and without shade and under both smallholder and plantation conditions. Coffee leaf nutrient contents can respond within eight months to fertilizer applications but seasonal variation in leaf nutrient contents is large. Leaf nutrient contents are generally higher in shaded coffee. Unshaded coffee nearly always responds to N fertilizers although two or more years are required before the response occurs. Without N fertilizers, coffee will die within a few years when there is no shade. Large applications of N have, however, been shown to strongly acidify the soils which is accompanied by a decrease in exchangeable cations. The application of K fertilizers is beneficial in some soils although negative effects on the uptake of Ca and Mg have been found. In some soils positive responses to P fertilizers occur with young coffee but no significant response to Mg fertilizers have been recorded in Papua New Guinea. Shaded coffee rarely responds to N fertilizers and negative effects have also been found. Shaded coffee commonly responds to K fertilizers up to 400 kg K₂O/ha. Positive responses to Zn and B have also been recorded. Although substantial yield increases may be obtained with inorganic fertilizer applications, recycling of coffee litter, prunings and processing waste products, can reduce fertilizer applications by up to 20%.

Keywords: arabica coffee, nutrition, fertiliser, shade, waste products, plantations, smallholder gardens, Papua New Guinea.

INTRODUCTION

Coffee is PNG's most important rural export earner, and is the major source of income for one-third of the country's population. About 1 million bags (or 60,000 tonnes) of green bean are exported each year. Both arabica (*Coffea arabica* L.) and robusta (*Coffea canephora* Pierre ex Froehner) coffee are grown in PNG. The main arabica and robusta coffee growing areas in PNG have been identified by Harding (1985a). Robusta coffee accounts for less than 5% of PNG's total coffee production, and is grown below 600 m a.s.l. The bulk of PNG's coffee is arabica coffee, and is grown above 600 m a.s.l. in thirteen of the nineteen Provinces. More than 80% of the total production is grown by smallholders, of which there are approximately 280,000, about 15% is grown by around 100 plantations, and the balance is grown by several hun-

dred managed blocks. The total area under coffee probably exceeds 55,000 ha equivalent of pure stand coffee (Robinson 1983).

Following the Second World War, coffee was not an immediate priority for the Department of Agriculture. However, as the coffee industry grew, the need for coffee research was recognised by the Department. Thus, formal coffee research in PNG was initiated by the Department of Agriculture in 1954 (Carne and Charles 1966). The arabica coffee research programme was based at Aiyura Highlands Agricultural Experiment Station (HAES), and supplemented by trials at the Agricultural Extension Centres at Goroka (EHP) and Korn Farm (WHP). A relatively small robusta coffee research programme was based at Kerevat LAES, with a few activities undertaken at Saramandi Research Station (East Sepik Province) and Bubia Research

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