

Soil Fertility Decline in the Tropics with Case Studies on Plantations

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Foreword

Soil fertility decline remains one of the most serious problems facing the world. In many developing countries nutrient depletion already threatens food production, so that food shortages in Africa are again a serious problem. Methods for controlling soil degradation and improving productivity are well known, but in many parts of Africa and some countries in Asia the economic and political factors determining the acceptability of improved practices has limited their adoption. Hence this study by Dr Hartemink is important and opportune, particularly because of the emphasis on plantation crops, which have received less attention than their economic importance deserves.

In spite of criticisms, the 'green revolution' methods of greater fertilizer use with responsive crop varieties have mostly ensured that food production has kept pace with the rapid population growth of the past decades. Nevertheless the economic problems determining the costs of importing, manufacturing and distributing fertilizers, key factors in countering soil fertility decline and ensuring yield improvements, have not been solved. This book emphasizes that crop production cannot be sustained unless nutrient removals are balanced by replenishment, and soil erosion is controlled.

In spite of long-term fertilizer experiments with perennials and plantation crops, some of which started more than a century ago, yields have not always been maintained or improved. In this book reports of soil chemical changes under plantation and perennial crops are analysed. In many of these reports the inadequacies of the data limit the value of the results. These inadequacies include failure to provide data on the nutrient status of the soil before cultivation or

establishment of the plantation, failure to define the soil type, failure to provide sufficient data regarding the soil management practices used, and failure to give other essential information about crop variety and climate.

On sisal estates in Tanzania serious yield decline occurred between the 1960s and 1980s, and many estates had to be abandoned. Sisal production from Tanzania fell from over 200,000 to 30,000 t/year. The decline was attributed to a fall in the world market price, and the key factor of soil fertility decline was largely ignored. Soil fertility decline has also been an important factor making sugarcane production uneconomic in many developing countries. Yield decline is often due to acidification caused by continued use of ammonium-based fertilizers, without correction by liming.

Dr Hartemink has worked in Kenya, Tanzania, Congo, Indonesia and Papua New Guinea, so that he has first-hand experience of both crop production and plantation developments in the tropics, as well as the relation between soil conditions and productivity.

This book should help to refocus attention on the dangers of continuing soil degradation, and on the need to ensure that positive nutrient balances are maintained for plantation as well as for food crops.

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