Improving lowland rice cultivation

Useful management practices for smallholders in tropical Africa
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Foreword

Lowland rice cultivation is practised in all tropical African countries. Although rice is the main crop and staple food of many African farm families most of the information on the rice cultivation is based on experiences with small-scale rice production in Asia. The aim of this Agrodok is to provide extension workers and smallholder rice farmers in tropical Africa with the practical and up-to-date information they need to increase the profitability and sustainability of their rice farming and rice processing practices.

As authors we have drawn on our experiences with lowland rice research and development in Tanzania, Togo, Guyana, Surinam and the Sahel to show how farmers can improve their yields by following the steps we outline in this Agrodok. Several experienced agriculturalists and organisations have contributed to this handbook and we would like to thank them for sharing their expertise with us. Robert Elmont, Ab Wanders, Paul Belder, Yacouba Séré and Jonne Rodenburg provided us with specific information on harvesting, storage, water management and pest control while Timothy Krupnik’s comments on SRI and Roland Buersh’s information about the use of the leaf colour chart were particularly valuable. Finally, our special thanks are due to Willem Stoop and Wim Andriesse, who reviewed the entire manuscript.

Bert Meertens and Michiel de Vries
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1 Introduction

This Agrodok on lowland rice is primarily meant for smallholders in tropical Africa, because the advocated cultivation and processing practices reflect the main circumstances encountered by rice farmers on this continent. The aim of this Agrodok is to inform extension workers and smallholder rice farmers in tropical Africa about current views concerning efficient, profitable and sustainable lowland rice farming and rice processing.

Lowland rice cultivation is practised on about half of the total rice area in tropical Africa. On the other half upland rice cultivation is practised. Deep-water rice cultivation occupies only a very small part of the total rice area.

Generally, lowland rice cultivation is characterised by rice fields which are submerged to a maximum depth of 50 cm for almost the complete growing season. Upland rice cultivation is characterised by rice fields which are not submerged most of the time. Deep-water rice fields have a minimum of 50 cm standing water in which the rapid growth of the rice plants’ internodes keeps pace with the rising water. Deep-water rice can grow as tall as 5 m.
This booklet cannot cover all the details of lowland rice cultivation and processing in tropical Africa due to its limited size and the many different circumstances in tropical Africa related to climate, soils, pests and water management. We chose to focus on the main rice management practices, especially water management practices, which can be adapted by the farmers themselves and which affect the quantity and quality of the rice yield. Although there are many booklets available on lowland rice cultivation in Asia, this Agrodok is specifically suitable for smallholders who cultivate lowland rice in tropical Africa.

**Cultivation systems**

Lowland rice cultivation covers a wide range of cultivation systems, including mangrove swamp rice along coastal regions with tidal intrusion, inland swamp rice on flat or saucer-shaped valley bottoms with varying degrees of flooding, rice on river floodplains, and rice on bunded fields under rainfed or irrigated conditions. A very important factor in classifying these cultivation systems is the degree of water control. Without land levelling, bunds or water inlets/outlets, good water control will be difficult. Conversely, optimal water control can be achieved in well constructed and managed irrigated systems with perfectly levelled fields and a secure water supply. A vast range of water management situations exist in between minimal and optimal water control.

The degree of water control has a strong impact on the germination, growth and harvest of the rice plant. The degree of water control furthermore determines the strategies available to farmers for preparing the land, the use of fertilisers and the management of weeds and pests. This booklet presents how small-scale farmers can improve their water management. It further indicates which cultivation methods match good, moderate and weak water control in the rice fields.