

# Preface

Over 60% of Africans depend on some form of farming for their sustenance and livelihoods. Agriculture remains vital for the continent's development and economic growth. So the recent stagnation or decline in farm productivity in many parts of Africa is a major concern. For many communities and countries, this has translated into chronic food insecurity and growing poverty. Households and communities are increasingly vulnerable, as their only resource – their land – can no longer sustain them.

Africa is witnessing severe degradation to its farmlands. Much of this degradation can be attributed to common, but exploitative, farming practices – ploughing that destroys the soil structure and degrades organic matter, burning or removing crop residues, monocropping, and so on.

Soil and water management practices that sustain and enhance the productivity of arable soils are a **must** for Africa. They are a vital part of the long-term solution to food insecurity and poverty.

**Conservation agriculture** aims to overcome these problems. It consists of three simple principles – *disturb the soil as little as possible, keep the soil covered, and mix and rotate crops*. These principles can be put into practice in many different ways. Farmers throughout Africa, and throughout the world, are beginning to adopt them. They have seen their yields rise, their soil gain in fertility, and their labour needs fall.

But conservation agriculture must be promoted actively if it is to spread rapidly. Grassroot players (farmers, extension workers, input suppliers, etc.) often lack information on what to do and where to do it. This manual aims to fill this gap.

## This manual

This manual tries to do the following:

- It explains what conservation agriculture is, and why it is important.
- It describes how to use conservation agriculture principles in the field.
- It highlights the issues and challenges that farmers and extension personnel may encounter when they adopt and adapt conservation agriculture.
- It suggests ways to adapt and disseminate this approach to farming.
- It gives examples of experiences with conservation agriculture in real life.

This manual is part of a larger effort to develop and promote conservation agriculture in Africa and worldwide. It is designed to reflect the experiences and views of many conservation agriculture practitioners (farmers, researchers and support organizations) to respond to the looming hunger and environmental degradation in sub-Saharan Africa. It aims to enhance knowledge and awareness on conservation agriculture and promote the adoption and adap-

tation of this approach throughout Africa. It is the first truly Africa-wide manual on conservation agriculture.

African farmers face a bewildering variety of conditions: highland and lowland, tropical and temperate, high and low rainfall, rich and poor soils, large and small farms. They grow a huge range of crops. Some farmers are commercially oriented; others eat everything they grow. It is impossible for one book to cover all the different variations.

Fortunately, this is not necessary. Conservation agriculture is not a single set of techniques – there is no one “best practice”. Rather, its three principles can be applied in different ways in different situations. This book outlines these principles ([on page 4](#)), then shows how to adapt them to suit the particular set of circumstances that you – the farmer or extension worker – face. It is up to you to decide on what is best for you. Innovate, test and adapt the techniques in this book, and encourage your friends and neighbours to do the same.

The manual also reflects the character of conservation agriculture – holistic and multi-disciplinary. It also describes how conservation agriculture relates to other key areas that farmers are concerned with: socioeconomic issues, culture and traditions, marketing, and livestock.

This manual is intended primarily for Africa’s farmers and extension workers: the people who stand to benefit directly from conservation agriculture. It is written in a simple style, avoiding jargon, so it is easy to understand, and easy to translate into local languages. Many of the illustrations can be enlarged or adapted for use on posters or training materials.

The book should also prove useful for others interested in conservation agriculture: agricultural researchers and policymakers, NGO staff, trainers, teachers and students. It should serve as a comprehensive resource on conservation agriculture in Africa and worldwide.

## How this manual was prepared

The initial idea for this manual came from a meeting in Zambia, when over 40 researchers and field practitioners from Africa met to prepare for the Second World Congress on Conservation Agriculture (held in Brazil in 2003). The large number of papers and posters gathered for this meeting formed a rich potential basis for a comprehensive manual on conservation agriculture in Africa.

The International Institute of Rural Reconstruction (IIRR) developed the concept of a manual further, and discussed the idea with RELMA, ICRAF’s Regional Land Management Unit. RELMA provided a start-up fund. FAO, CTA and IFAD also provided valuable financial support. The resulting manual was to be ready for the third World Congress, held in Nairobi in October 2005.

A small consultative group of key stakeholders was formed into a steering committee, which decided that IIRR and the African Conservation Tillage

Network (ACT) be the lead agencies. IIRR was designated as manager and overall project coordinator.

A group of key stakeholders met in November 2004 in Nairobi to generate a set of themes and topics for the manual. The same group identified various promising practices and suggested organizations that practise conservation agriculture, as well as resource persons and individuals who might generate case materials and manuscripts on various topics. IIRR then invited them to prepare manuscripts on the selected topics and to present them at a “writeshop”.

## **The Karen writeshop**

The writeshop (an intensive, 2-week workshop) was held in Karen, near Nairobi, on 18–29 April 2005. The contributors brought their manuscripts with them, along with other printed materials, photographs and conservation agriculture equipment. In all, some 60 farmers, extension staff, scientists and practitioners from 14 African countries participated, as well as specialists from Brazil and Europe. Another 30 contributors were unable to attend the writeshop but submitted manuscripts for discussion by the participants.

The writeshop began with a series of presentations by participants on various aspects of conservation agriculture. The participants were then divided into a number of groups, each focusing on a specific theme, such as “field preparation” or “economics”. These groups were asked to write a draft chapter on their theme, based on the manuscripts that had been prepared for the writeshop and on their own knowledge and experience. Each group prepared a draft chapter, which they presented to the plenary.

The other participants commented on the drafts, asked questions, and suggested additions or changes. The individual groups then revised their drafts. A team of editors assisted with drafting and revising the text, and artists drew illustrations to accompany it.

The groups presented their revised drafts to the plenary a second time, along with the illustrations, and the other participants were able to make further suggestions. The editors and artists again helped revise the text and illustrations. By the end of the writeshop, the groups had completed drafts for each of the chapters in the book you are reading.

The groups were fairly fluid: individual participants were able to move from group to group, so contributing to the detailed drafting of more than one chapter.

Throughout the writeshop, participants wrote about their specific experiences with conservation agriculture. These cases appear in boxes in the text. They provide valuable examples of how conservation agriculture works in practice.

After the writeshop, considerable restructuring and rewriting were necessary to eliminate overlap among the various chapters and to ensure the style was clear and consistent. This was done by the chief editor, who also commissioned new artwork to fill in gaps.

Through the writeshop process, the initial manuscripts were revised substantially or were completely rewritten. The information they contained was selected, sifted, and combined with ideas from other sources, and was distributed throughout the manual. A single section in the book may contain information provided by many different participants. This means it is not possible to label a particular chapter or section as the work of a particular participant. The “authors” of the manual are thus the contributors [listed on page xviii](#): both those who attended the writeshop and those who provided manuscripts.

## Writeshop advantages

The sequence described above is an adaptation of the writeshop approach pioneered by IIRR at its headquarters in the Philippines. IIRR-Africa has used this approach to produce extension and information materials on a wide range of subjects.

Writeshops have several advantages over conventional methods of producing a publication. They speed up the production process, taking full advantage of the participants’ expertise. The process of writing, getting comments, revising and illustrating takes place at the same time, considerably shortening the often-difficult process of writing, editing and publishing. A large number of participants contribute to each topic: in effect, the writeshop provides an opportunity for technical peer review by a large number of reviewers, as well as pretesting for understandability and field relevance by a group of the intended readers.

In addition, writeshops bring together a large number of people from various institutions and walks of life, each with different perspectives and expertise. They are an excellent training and networking opportunity, with individuals learning about each other’s work and exchanging ideas and experiences that will be of value for them when they return home. It is hoped that the relationships and networks forged during the writeshop will continue long into the future.

## Structure of this book

This book is divided into 14 chapters.

[Chapter 1](#), *What is conservation agriculture?*, explains the principles of conservation agriculture, and describes the benefits it can bring to farmers who adopt it. It compares conservation agriculture with conventional farming practices. It also briefly describes the history of the approach worldwide and in Africa, and outlines some challenges facing its rapid spread.

[Chapter 2](#), *Converting to conservation agriculture*, tells readers what to expect in the first few years after they adopt this new approach to farming. It lists some questions farmers should ask when considering switching to conservation agriculture, and describes how to find the answers.

**Chapter 3**, *Field preparation and planting*, describes how to prepare a field for conservation agriculture, various ways of planting crops, and how to work out how much seed and fertilizer to use.

**Chapter 4**, *Keeping the soil healthy*, introduces the concept of soil health – which depends on the amount of organic matter in the soil. It shows how to tell whether your soil is sick, and what to do to nurse it back to health.

**Chapter 5**, *Soil cover*, discusses the importance of keeping the soil covered, and the two main ways of doing so: using cover crops and mulch. It especially addresses a major problem that many farmers face when they first adopt conservation agriculture: the choice of a cover crop and how to obtain seeds.

**Chapter 6**, *Crops and cropping systems*, discusses various types of cropping systems (intercropping, sequential cropping, and so on), the benefits of crop rotation, and factors to consider when choosing which crops to grow.

**Chapter 7**, *Controlling weeds*, discusses the vital topic of how to control the weeds that will take over the fields unless the farmer manages them properly. It describes various ways to control them: by maintaining soil cover, by mechanical weeding, or using herbicides. It gives special attention to using the right amount of herbicides, in a correct and safe way.

**Chapter 8**, *Conserving soil and water*, describes various soil and water conservation technologies that can be combined with conservation agriculture.

**Chapter 9**, *Livestock*, covers three issues relating to livestock and conservation agriculture: feeding animals, protecting fields from livestock, and training animals to pull conservation agriculture equipment.

**Chapter 10**, *Harvesting, marketing and input supplies*, addresses issues that farmers are likely to encounter in harvesting, storing, processing and marketing their produce, and in obtaining inputs and credit for their conservation agriculture operation.

**Chapter 11** is entitled *Should you adopt conservation agriculture?* It poses (and answers) some questions that farmers may have about conservation agriculture before they adopt it: How does it benefit me? How much does it cost? Is it profitable?, and so on. For each question, it shows how farmers can work out the answers themselves, so they can make an informed decision on what to do.

**Chapter 12**, *Conservation agriculture and people*, explores the social and cultural dimensions of this approach. It looks at five areas: the roles of women and men, cultural beliefs, HIV/AIDS, farmers with disabilities, and young people.

**Chapter 13**, *Encouraging adaptation and adoption*, is aimed primarily at extension workers, researchers and policymakers. It suggests various ways to test and adapt particular conservation agriculture practices in a participatory way with groups of farmers. It also provides ideas on how to promote conservation agriculture through various extension approaches.

[Chapter 14, Resources](#), includes the profiles and contact details of the contributors, a list of resource organizations and websites, manufacturers of conservation agriculture equipment, and publications with further information on this approach.

Throughout the manual, boxes describe how farmers, projects and research institutions have applied conservation agriculture. These cases are drawn from the experiences of the manual's contributors, who represent a wide range of countries and farming conditions from throughout Africa. For further details on the individual experiences, please contact the individuals and organizations [listed on page xviii \(see addresses in Chapter 14\)](#).