Conservation Agriculture
A manual for farmers and extension workers in Africa
CONSERVATION AGRICULTURE

A MANUAL FOR FARMERS AND EXTENSION WORKERS IN AFRICA

IIRR
International Institute of Rural Reconstruction

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The International Institute of Rural Reconstruction is a non-profit, non-governmental organization that aims to improve the quality of lives of the rural poor in developing countries through rural reconstruction: a sustainable, integrated, people-centred development strategy generated through practical field experiences. Based in the Philippines, IIRR has regional offices in Africa (located in Nairobi), Latin America (Quito) and Asia (Silang, the Philippines). IIRR’s Africa office is committed to strengthening the institutional capacity of partner organizations through knowledge generation, acquisition and sharing.

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The African Conservation Tillage Network promotes the sharing of information and experiences and facilitates the adaptation and adoption of conservation agriculture principles and practices in Africa. ACT is a Pan-African, international association, involving private, public and non-government sectors, and including farmers, input and machinery manufacturers and suppliers, researchers and extensionists, with an active conviction to promote, support and apply conservation agriculture to ensure viable and sustainable agriculture productivity while minimizing or reversing the environmental degradation that is devastating the continent. Membership is open to any individuals or groups committed to the development and promotion of conservation farming/tillage technologies for smallholder farmers in Africa.

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# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>ix</td>
</tr>
<tr>
<td>Preface</td>
<td>xi</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>xvii</td>
</tr>
<tr>
<td>List of contributors</td>
<td>xviii</td>
</tr>
<tr>
<td><strong>1 What is conservation agriculture?</strong></td>
<td>1</td>
</tr>
<tr>
<td>Why start using conservation agriculture?</td>
<td>5</td>
</tr>
<tr>
<td>How conservation agriculture works in different types of farms</td>
<td>6</td>
</tr>
<tr>
<td>Different situations</td>
<td>10</td>
</tr>
<tr>
<td>Conventional vs conservation</td>
<td>10</td>
</tr>
<tr>
<td>Effects of conventional farming and conservation agriculture</td>
<td>13</td>
</tr>
<tr>
<td>History of conservation agriculture</td>
<td>19</td>
</tr>
<tr>
<td>Conservation agriculture in Africa</td>
<td>20</td>
</tr>
<tr>
<td>Challenges for conservation agriculture</td>
<td>22</td>
</tr>
<tr>
<td><strong>2 Converting to conservation agriculture</strong></td>
<td>25</td>
</tr>
<tr>
<td>Three stages</td>
<td>26</td>
</tr>
<tr>
<td>Questions to ask</td>
<td>28</td>
</tr>
<tr>
<td>Where to find answers in this book</td>
<td>30</td>
</tr>
<tr>
<td>What are the risks?</td>
<td>33</td>
</tr>
<tr>
<td><strong>3 Field preparation and planting</strong></td>
<td>35</td>
</tr>
<tr>
<td>Before starting conservation agriculture</td>
<td>36</td>
</tr>
<tr>
<td>Planting basins</td>
<td>41</td>
</tr>
<tr>
<td>Planting spots</td>
<td>47</td>
</tr>
<tr>
<td>Ripping and planting</td>
<td>47</td>
</tr>
<tr>
<td>Controlling weeds and the cover crop before planting</td>
<td>51</td>
</tr>
<tr>
<td>Planting methods</td>
<td>51</td>
</tr>
<tr>
<td>Using the right amount of seed and fertilizer</td>
<td>55</td>
</tr>
<tr>
<td><strong>4 Keeping the soil healthy</strong></td>
<td>63</td>
</tr>
<tr>
<td>What makes soils hungry and sick?</td>
<td>64</td>
</tr>
<tr>
<td>Organic matter</td>
<td>67</td>
</tr>
<tr>
<td>Making the soil healthy again</td>
<td>68</td>
</tr>
<tr>
<td>Keeping the soil healthy</td>
<td>70</td>
</tr>
<tr>
<td>Chapter</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td><strong>Soil cover</strong></td>
</tr>
<tr>
<td></td>
<td>Cover crops</td>
</tr>
<tr>
<td></td>
<td>Mulch</td>
</tr>
<tr>
<td></td>
<td>Challenges for maintaining soil cover</td>
</tr>
<tr>
<td>6</td>
<td><strong>Crops and cropping systems</strong></td>
</tr>
<tr>
<td></td>
<td>Crop rotation</td>
</tr>
<tr>
<td></td>
<td>Converting a cropping system to conservation agriculture</td>
</tr>
<tr>
<td></td>
<td>Challenges in cropping systems</td>
</tr>
<tr>
<td>7</td>
<td><strong>Controlling weeds</strong></td>
</tr>
<tr>
<td></td>
<td>How to manage weeds</td>
</tr>
<tr>
<td></td>
<td>Managing weeds with soil cover and crops</td>
</tr>
<tr>
<td></td>
<td>Weeding by hand or with equipment</td>
</tr>
<tr>
<td></td>
<td>Herbicides</td>
</tr>
<tr>
<td></td>
<td>When and how to weed</td>
</tr>
<tr>
<td></td>
<td>Challenges in managing weeds</td>
</tr>
<tr>
<td></td>
<td>Using the right amount of herbicide</td>
</tr>
<tr>
<td></td>
<td>Using herbicides correctly</td>
</tr>
<tr>
<td></td>
<td>Using herbicides safely</td>
</tr>
<tr>
<td></td>
<td>Care of sprayers</td>
</tr>
<tr>
<td>8</td>
<td><strong>Conserving soil and water</strong></td>
</tr>
<tr>
<td></td>
<td>Soil conservation techniques</td>
</tr>
<tr>
<td></td>
<td>Conserving water</td>
</tr>
<tr>
<td>9</td>
<td><strong>Livestock</strong></td>
</tr>
<tr>
<td></td>
<td>Feeding animals</td>
</tr>
<tr>
<td></td>
<td>Sources of feed</td>
</tr>
<tr>
<td></td>
<td>Protecting your fields</td>
</tr>
<tr>
<td></td>
<td>Work animals</td>
</tr>
<tr>
<td>10</td>
<td><strong>Harvesting, marketing and input supplies</strong></td>
</tr>
<tr>
<td></td>
<td>Harvesting</td>
</tr>
<tr>
<td></td>
<td>Storage</td>
</tr>
<tr>
<td></td>
<td>Processing and marketing</td>
</tr>
<tr>
<td></td>
<td>Inputs</td>
</tr>
<tr>
<td></td>
<td>Obtaining inputs</td>
</tr>
</tbody>
</table>
11 Should you adopt conservation agriculture? 167
How can conservation agriculture benefit me? 168
How does conservation agriculture benefit other people? 169
How much yield does conservation agriculture produce? 169
How much does conservation agriculture cost? 170
Is conservation agriculture profitable? 177
Is conservation agriculture worthwhile? 178
How much work is conservation agriculture? 180
When is the work needed? 180

12 Conservation agriculture and people 185
Women and men 186
Cultural beliefs 190
HIV/AIDS 193
Farmers with disabilities 195
Young people 196

13 Encouraging adaptation and adoption 199
Adapting conservation agriculture 200
Ways to promote conservation agriculture 204
Training 205
Extension 209
Demonstrations 209
Farmer field schools 210
Schools and churches 213
Farmer champions 214
Farmer-to-farmer extension 215
Farmers’ organizations 215
Other ways to share experiences 215
Farming as a business 217
Multiple stakeholder partnerships 218
Small-scale entrepreneurs and private business 220
Policy support 220

14 Resources 223
Contributors’ profiles 224
Resource organizations and websites 238
Equipment manufacturers 245
Resource materials 247
Foreword

Over the last couple of decades, conservation agriculture has gained increasing interest worldwide as well as in Africa. This approach to farming is very attractive for African farmers: it boosts yields, saves labour and money, and conserves the soil and the environment. It appeals to all categories of farmers – from small-scale subsistence farmers to high-tech commercial producers. It can be used in all climates and on all soils where it is possible to grow crops. And it appeals to the general public and to national leaders as a policy to promote and approve.

Conservation agriculture contributes significantly to meet three of the Millennium Development Goals.

- **MDG 1: Eradicate extreme poverty and hunger**  Conservation agriculture helps farmers produce more food – for themselves and for the market. It helps stabilize yields, especially during drought. It uses less labour and fewer expensive inputs than conventional agriculture.

- **MDG 7: Ensure environmental sustainability**  Conservation agriculture produces a healthy, productive soil, halts erosion, reduces river pollution, increases the amount of organic matter in the soil, and takes CO₂ out of the atmosphere.

- **MDG 8: Develop a global partnership for development**  Conservation agriculture is a global movement. It brings development agencies, the private sector, civil society, research institutions, local organizations and farmers together to contribute to the other MDGs.

Conservation agriculture also fits in well with two of the major NEPAD (New Partnership for Africa’s Development) sectoral priorities: agriculture and the environment.

This book explains why conservation agriculture has such promise. It shows how farmers and extension workers can do it.

This book is the result of an initiative by a group of people from various institutions across Africa and throughout the world. This group includes farmers and researchers, extension workers and policy makers, governments, non-government organizations and the private sector. A unique alliance for a uniquely promising approach.

They have drawn on their own knowledge, on the work of their organizations, and on the successes of hundreds of thousands of farmers through Africa. They have put all these experiences together into this guide: the first manual on conservation agriculture covering the whole of Africa.

The method used to create this book – a “writeshop” involving more than 90 contributors – is highly appreciated. It shows an impressive will by a large group from many different countries, from different walks of life, and with highly different specializations and interests, to come together and produce a
product that all agree upon. The feeling of joint ownership will help the mes-
sage of conservation agriculture spread much more quickly than if a single
person had attempted to write this book alone.

It is a special joy to see that the two areas of agriculture and communication
have joined hands in a common understanding that a written manual is of
little use if its messages are not communicated wide and far.

It is our hope that this book will be distributed widely, and will be read by
many. More important, we urge readers to put to use the information it con-
tains. While the book is intended especially for extension workers and other
agricultural service providers, we would also recommend that students in
schools and universities read it. So should many farmers, and those who rep-
resent our peoples in various forums on agriculture and food security.

Finally, we want to recognize the international aspect of conservation agricul-
ture. This book is “African”. But it reaches even further out. It will be a major
input into the World Congress on Conservation Agriculture, to be held in Nai-
robi in October 2005 under a NEPAD arrangement and with the African Con-
servation Tillage Network. This congress marks a new beginning for a conti-
nent with an increasing will to get together to influence global policies and
decision making.

We thank all involved in producing and distributing this book, and those
charged with transforming its messages into practical use. Most of all, though,
we hope that our farmers will be able to use conservation agriculture to bring
prosperity to their families and for their societies.

Hon. Kipruto arap Kirwa
Minister of Agriculture and
Livestock Development
Republic of Kenya

Nairobi, August 2005
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 be 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.
- 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-
Conservation Agriculture

Conservation Agriculture, the subject of this paper, is a concept that emphasizes sustainable agriculture. It is based on three key principles: minimum soil disturbance, on-farm crop diversity, and minimum input use. These principles aim to improve soil health and productivity, while reducing environmental impact.

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 3), 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: socio-economic 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 simple language 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
Conservation Agriculture

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 practised 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, as well as from Brazil and Europe, participated. 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 “land 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 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 holding.

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 this 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, and tells readers what to expect in the first few years after they adopt it. It also briefly describes the history of the approach in Africa and worldwide, and outlines some challenges facing its rapid spread.

**Chapter 2, Converting to conservation agriculture**, guides readers through the challenges of starting out with this new approach to farming. It lists some questions farmers should ask, 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.
Conservation Agriculture

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).
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- The staff of IIRR’s Africa Regional Centre and Acacia Consultants, Cordaid regional and headquarters staff, and I/C Consult.
- The many other, unnamed local people, extension workers, researchers, government and NGO staff, whose knowledge and experiences are reflected in this book.
- The management and staff of the Agricultural Finance Corporation Training Centre, where the writeshop to produce this book was held.

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14

Resources
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230
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Originally from Sweden, Gus has a PhD in plant pathology and has worked as a horticulturist in various countries since 1944. He specializes in nursery crops and dryland farming.

**Elijah Njoroge Njenga**

Development Artist, Prowess Plus Designs

PO Box 3784, City Square, Nairobi, Kenya. Tel. +254 724 762306, email prowessplus@yahoo.com

Elijah trained as a graphic designer and has worked as a development artist with several organizations, including the Intermediate Technology Development Group, ActionAid, ABANTU, KHRC, and the International Institute of Rural Reconstruction. He has also worked with the schoolbook publishers Macmillan and Kenya Literature Bureau.

**Rahab Njoroge**

Strategic Capacity Building Outreach Manager, IIRR Africa

PO Box 66873-00800, Nairobi, Kenya. Tel. +254 20 444 2610, 4440991, fax +254 20 444 8814, email rahab@iirr-africa.org, internet www.iirr.org

Rahab has 15 years of facilitation, training and management experience in business and development. She has been Principal of SATTC College in Mahe, Seychelles, and coordinator of the ActionAid-Kenya Inter-Development Centre in Kisumu. She holds a BSc in business management from Florida International University, a diploma in sales and marketing, and an advanced certificate in adult learning.
Gnamitche Anne Djedjro Ep Noriel Nomel
Community Development Officer, Agence Nationale d’Appui au Développement Rural
BP V183, Abidjan 01, Côte d’Ivoire. Tel. +225 20 21 0564, email a.nomel@anader.or.ci, nomelanne@hotmail.com
Anne holds a bachelor’s degree in chemical engineering and an MSc in industrial engineering from the State University of New York, Buffalo. She has worked for 15 years in food research and development in a government/private-sector institute. For the past 5 years she has been working with the National Community Development and Land Tenure Programme.

Qureish Noordin
Development Facilitator, World Agroforestry Centre (ICRAF)
PO Box 2389, Kisumu, Kenya. Tel. +254 57 2021918, 2021456, fax 2021234, email q.noordin@cgiar.org, internet www.worldagroforestrycentre.org
Noordin has an MPhil in tropical forest soils. He has 12 years of experience in community-based extension services and participatory approaches. He is currently working with ICRAF as a development facilitator specializing in partnerships and scaling up.

Anthony Nyakuni
Extension Advisor, National Agricultural Advisory Services (NAADS) Secretariat
Plot 39A Lumumba Avenue, Mawusi House, Box 2 5235, Kampala, Uganda. Tel. +256 41 345065, mobile 77874126, +256 41 347843, email anyakuni@yahoo.com
Nyakuni holds a bachelor’s in agriculture and has extensive field experience in soil and water management, agroforestry, sustainable land management and participatory extension approaches. Since 2003 he has facilitated the integration of land management issues into NAADS. He has written books on extension approaches and land resources.

Paul Nyende
Consultant, Land Management, Food and Agriculture Organization of the United Nations, Technical Cooperation Programme on Conservation Agriculture (TCP-CA) Project, Uganda
Tel. +256 77 495950, email pnyende@yahoo.com, pnyende@Africa2000Network.org
Paul holds an MSc in soil science and a BSc in agriculture. He has previously worked with the International Centre for Tropical Agriculture as a research associate in Uganda and as a programme coordinator with the Africa 2000 Network. He is now a consultant on land management for a project piloting conservation agriculture in Uganda.

Edwyn Odeny Odhiambo
Executive Director, National School Feeding Council of Kenya
Box 49772, Nairobi 00100, Kenya. Tel. +254 20 608960, email nsfck@yahoo.com, kyf73@hotmail.com
Odhiambo holds a BSc in agricultural economics from Egerton University. He worked as a volunteer team leader for the Kenya Youth Foundation in charge of agriculture, food security and sustainable natural resource management, then joined the Kenya Freedom from Hunger Council as development officer for food security, water and sanitation. In February 2005 he became executive director of the National School Feeding Council of Kenya.

Okech John Odingo
Farmer, Kusa Community Development Society
PO Box 110, Pap Onditi, Kisumu, Kenya. Tel. +254 733 341496
Okech is a retired education officer. He has worked with many development projects and is a member of various voluntary organizations. He takes a keen interest in farming initiatives.

Wilfred Richard Odogola
Director, Agricultural Engineering Research, Agricultural Engineering and Applied Technology Research Institute
Odogola holds an MSc in agricultural engineering from the Agricultural Mechanization and Electrification University, Rousse, Bulgaria. He has 30 years of experience as a lecturer and researcher on agricultural engineering with the National Agricultural Research Organisation (NARO) of Uganda. He has worked with projects funded by the Ugandan government, the World Bank, SIDA, DFID and other donors. Besides specializing in farm power and mechanization, he has 8 years of experience in post-harvest and rural energy systems, and in water for agricultural production. He has been involved in conservation agriculture since 2000.

**Alex Raymond Oduor**

Information Officer, Global Water Partnership Associated Programme, RELMA in ICRAF

World Agroforestry Centre, PO Box 30677, Nairobi 00100, Kenya. Tel. +254 20 7224424, 7224000, fax +254 20 7224401, email a.oduor@cgiar.org, internet www.searnet.org

Alex holds an MSc in water and environmental resources engineering from the UNESCO-IHE Institute of Water Education in Delft, Netherlands. As a research technologist with the Swedish Agency for Research Co-operation with Developing Countries (SAREC), he was in charge of the Steepland Research Station and the Soil and Water Laboratories of the Department of Agricultural Engineering, University of Nairobi between 1990 and 1998. He also served as a soil and water conservation officer with the Ministry of Agriculture, Machakos District, Kenya, from 1984 to 1990.

**Aileen Ogolla**

Communication and Administrator Officer, World Agroforestry Centre

PO Box 30677-00100, United Nations Avenue, Nairobi, Kenya. Tel. +254 20 7224000 ext. 4108, fax +254 20 7224401, email a.ogolla@cgiar.org, internet www.worldagroforestrycentre.org

Aileen holds an MA in communication. Before joining the World Agroforestry Centre, she worked as a public relations officer and as a communications specialist with IIRR.

**Benjamin Ojwang**

Illustrator and Graphic Designer

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Benjamin has a BA in design from the University of Nairobi. He has worked as a designer for Longman Kenya, East Africa Educational Publishers, and University of Nairobi Press. He produces freehand and computer-generated scientific and technical art for publications.

**Alfred Ombati**

Artist

PO Box 64427-00600, Nairobi, Kenya. Tel. +254 723 350628, 721 420806, email aholiabsart@yahoo.com

Alfred is a freelance artist. He has worked for EPZ (Ancheneyer), and has developed story books for Ribena and Panadol. He is currently working with Cover Concept Ltd. as an illustrator, as well as with IIRR. He does fine art, paintings, murals, portraits, book illustrations and comics.

**Kennedy Otieno**

Farmer Field School Facilitator and Extensionist, Conservation Agriculture for Sustainable Agriculture in Rural Development project (CA-SARD)

PO Box 3, Siaya, Kenya. Tel. +254 721 735629, email elizabethopole@yahoo.com

Kennedy has been promoting conservation agriculture in western Kenya since 1995. He learned farmer field school and conservation agriculture methods with FAO and FITCA(K). He has promoted conservation agriculture as a volunteer and has worked with various community organizations on food security and the environment. He is currently studying indigenous practices and cover crops.

**Marietha Owenya**

Principal Agricultural Field Officer I, Selian Agricultural Research Institute (SARI)

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Marietha works with SARI on on-farm socio-economics and agronomy research. She is also assistant national facilitator on conservation agriculture for sustainable development with an FAO-supported project covering 30 farmer field schools in Tanzania.

**Motipi Ranthimo**

Pastor and Trainer in Conservation Agriculture, Lesotho Evangelical Church  
Tsoelike LEC, PO Box Tsoelike 612, Qachas Nek, Lesotho. Tel. +266 588 83670

Motipi studied theology at the Morija Seminary of the Lesotho Evangelical Church. He has been pastoring at Tsoelike Lesotho Evangelical Church for the last 7 years. He has been practising conservation agriculture for 3 years with support from FAO.

**Cecilia Ruben**

Programme Development Manager, Stockholm Environment Institute (SEI)  
Box 2142, 10314 Stockholm, Sweden. Tel. +46 8 412 1416, fax +46 8 723 0348, email cecilia.ruben@sei.se, internet www.sei.se, www.ecosanres.org

Cecilia has an MSc in urban planning from Columbia University, New York, and a Fil kand in cultural geography and political science from Stockholm University. She has been involved in international environment research and development cooperation since 1971. Her work with the Stockholm Environmental Institute focuses on policy development for sustainability, and especially on ecological sanitation.

**Brian Sims**

Independent Consultant on Small Farm Mechanization, Engineering for Development  
3 Bourneside, Bedford, MK41 7EG, UK. Tel. +44 1234 271699, 7966 155738, email briangsims@aol.com

Brian has 30 years of experience of smallholder farm mechanization development, especially in Latin America. He has focused on needs assessment, participatory technology development, on-farm testing and evaluation, and communal manufacture and distribution. He is now using his experience to enhance conservation agriculture technology in sub-Saharan Africa.

**Kurt Steiner**

Independent Consultant in Land Management  
Goethestr. 7, 69250 Schonau, Germany. Tel. +49 6228 8457, email kurtsteiner@t-online.de

Kurt has worked on agricultural research in Africa since 1970, first in plant pathology and then plant breeding. Since 1980, he has worked on smallholder farming systems, promoting intercropping in West and East Africa. He has introduced on-farm experimentation in research and development projects in various countries. He has promoted sustainable soil management and conservation tillage throughout the continent. He is co-founder of the African Conservation Tillage Network.

**Gelson Tembo**

Lecturer/Research Consultant, Department of Agricultural Economics and Extension Education, University of Zambia  
PO Box 32379, Lusaka 10101, Zambia. Tel. +260 1 295419, 97 445494, email tembogel@zamnet.zm

Gelson holds a PhD in agricultural economics and statistics from Oklahoma State University and a bachelor of agricultural sciences from the University of Zambia. He has worked for the Dutch-funded Farming Systems Research Team-Western Province project, and as an agricultural economist for the Zambian government. He has conducted research on economics in Zambia and the USA, and has been involved in various regional and international missions, including for the United Nations, NEPAD, FAO and the African Conservation Tillage Network. He is currently part of a team of designing a collaborative masters programme in agricultural and applied economics, involving 16 African universities.

**Melesse Temesgen**

Researcher, Agricultural Engineer, Ethiopian Agricultural Research Organization
Conservation Agriculture

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Melesse holds a BSc from Alemaya University and an MSc in agricultural engineering from Newcastle University in the UK. He has been researcher in Ethiopia for 16 years and is currently studying for his PhD on conservation tillage in the Netherlands.

Bernard Triomphe

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Bernard is an agronomist with 20 years’ experience in farming and cropping systems research. During the past 15 years he has been combining his interest in participatory approaches with sustainable agriculture, conservation agriculture and cover crops, with direct field experience in Latin America, and more recently in Africa.

Bob Wagner

Editor
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Bob earned his MSc in dryland natural resource management with the Institute for Desert Research, University of Beersheba, Israel. As regional coordinator for the Arid Lands Information Network (1993 to 1999), he produced the well-known Baobab magazine. Since then, he has worked as a freelance writer and editor for several international organizations, with a focus on documenting sustainable natural resource management projects and practices.

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RECODA, Tanzania. Email recodatz@yahoo.co.uk

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Stockholm Environment Institute, Sweden. Email Johan.Rockstrom@sei.se
Resource organizations and websites

**Africa-wide**

**Africa Conservation Tillage (ACT) Network**

Zimbabwe office: No. 9 Balmoral Road, Borrowdale, Harare, Zimbabwe. Tel. +263 4 882107, fax +263 4 885596, email actnetwork@africamline.co.zw, internet www.act.org.zw. Contact: Martin Bwalya, Coordinator

Kenya office: PO Box 14733 00800, Westlands, Nairobi, Kenya. Email actnairobi@wananchi.com

Promotes and facilitates sharing of information and experiences on conservation farming principles and practices in Africa.

**Animal Traction Network for Eastern and Southern Africa (ATNESEA)**

www.atnesa.org

Access to over 700 documents, many of relevance to conservation agriculture.

**CropLife Africa Middle East**

www.croplifeafrica.org

Represents manufacturers and distributors of crop protection products (pesticides), seeds and biotechnology products in Africa and the Middle East.

**Ecoport**

http://ecoport.org

An important database for conservation agriculture practitioners and others.

**Green Water Harvesting Network**

Contact: Maimbo Malesu, m.malesu@cgiar.org

Eastern and Southern Africa and South Asia.

**Regional Land Management Unit (RELMA in ICRAF)**

World Agroforestry Centre, ICRAF House, UN Avenue, PO Box 30677, Nairobi 00100, Kenya. Tel. +254 20 524400, 524418, fax +254 20 524401, 524001, email relma@cgiar.org, internet www.relma.org

Supports small-scale farm production management (including conservation agriculture), capacity building, information and documentation, gender, environmental concerns, poverty reduction and efforts to combat HIV/AIDS.

**Winrock International**

ONFARM, BP E 457, Bamako, Mali. Tel. +223 293880, fax +223 292281, email nhanssens@winrock-mali.org, internet www.winrock.org. Contact: Neils Hanssens, West Africa Coordinator

Conservation Tillage Project (Senegal, Mali and Côte d’Ivoire); On-Farm Agriculture Resources Management (ONFARM) Program

**Burkina Faso**

**Institut de l’environnement et de recherches agricoles (INERA)**

Station de Koudougou, BP 10 Koudougou, Burkina Faso. Tel. +226 5044 65 10, 76 59 06 40, email albarro@yahoo.fr. Contact: Albert Barro

Station de Farako-ba, BP 910, Bobo-Dioulasso 01, Burkina Faso. Tel. +226 70264719, email soul_pueder@hotmail.com, osilamane@yahoo.fr. Contact: Souleymane Ouédraogo
Cameroon

Bimbia Bonadikombo Natural Resource Management Council (BBNRMC)
Tel. +237 935 62 50, email kjerry87@yahoo.com. Contact: Jerome Bekoh Keji

Cotton Development Company (SODECOTON)
PO Box 302, Garoua, Cameroon. Tel. +237 983 3881, email projet.esa@sodecoton.cn. Contact: Abdoulaye Abou Abba, Head officer, Soil Management Division
Soil conservation and water harvesting project monitored by Sodecoton and implementing field activities, training on soil conservation, water harvesting and implementation of conservation agriculture.

Institute of Agricultural Research for Development (IRAD)
PO Box 33, Maroua, Cameroon. Tel. +237 292640, fax +237 292640. Contact: Oin Noé
National research institute which works on conservation agriculture.

Chad

Institut Tchadien de Recherche Agronomique pour le Développement (ITRAD)
Programme Gestion des Ressources Naturelles, ITRAD, BP5400, NDjaména, Chad. Tel. +235 520073, email itrad@intnet.td Contact: Michel Naitornbaide, tel. +235 29 87 66, email naitornbaide_michel@yahoo.fr, damienhh@yahoo.fr.

Ethiopia

Mekelle University
Department of Mechanical Engineering, PO Box 231, Mekelle, Tigray, Ethiopia. Tel. +251 4 41 09 69, 40 75 00, fax +251 4 41 09 69. Contact: Fisseha Meresa, fishmere@yahoo.com, fishmere@mu.edu.et
Adaptation of maresha ploughs.

Ghana

Ministry of Food and Agriculture, Crop Services Directorate
PO Box M 37, Accra, Ghana. Tel. +233 21 665066, email cropserv@ghana.com Contact: J.K. Poku
Conservation agriculture included in work programme.

Guinea

Centre de Recherches Agronomique de Bordo (CRAB)
IRAG, BP 352, Kankan, Guinée. Tel. +224 11 58 42 76, email kourouna_makan@yahoo.fr. Contact: Makan Kourouma

Kenya

Consortium for Scaling up Options for Increased Farm Productivity in Western Kenya (COSOFAP)
PO Box 25199, Kisumu, Kenya. Tel. +254 057 351163/64, fax +254 057 2021234, email icrafksm@cgiar.org, internet www.ugunja.org/cosofap/
Training and provision of starter seeds for cover crops and fertilizer trees.
Conservation Agriculture

International Maize and Wheat Improvement Centre (CIMMYT)
PO Box 1041-00621, Village Market, Nairobi, Kenya. Tel. +254 20 7224600/05, fax +254 20 7224601, internet www.cimmyt.org. Contact: Fred Kanampiu, fkanampiu@cgiar.org

The project “Conservation agriculture promotion in smallholder agriculture” is implemented in Zimbabwe, Zambia, Malawi and Tanzania. It promotes farmer-to-farmer adoption of proven conservation agriculture technologies and practices.

Kenya Agriculture Research Institute (KARI)
PO Box 57811, Nairobi, Kenya. Tel. +254 2 583301-20, email jwwamuongo@kari.org. Contact: Jane Wamuongo or Joseph Mutua

Operating within the Kenya Conservation Tillage Initiative (KCTI) in Kenya’s subtropical and semi-arid environments.

Kenya Network for Draught Animal Technology (KENDAT)
PO Box 2859, 00200, City Square, Nairobi, Kenya. Tel./fax+254 20 6766939, email kendat@africaonline.co.ke, internet www.atnesa.org/kendat/ Contact: Pascal Kaumbutho

Partner (with the Ministry of Agriculture, RELMA, KARI, and the University of Nairobi) in the Kenya Conservation Tillage Initiative. Pilot trials of conservation agriculture, training of farmers and animals, training in handling equipment, field-days, key-stakeholder exposure and media campaigns, and manufacture and marketing of conservation tillage equipment.

Kenya Youth Foundation
PO Box 1894, 00200 Nairobi, Kenya. Tel. +254 20 550278, email kyf3@hotmail.com, kenya@youthlink.org. Contact: Bernard Luta

Rural Youth Livelihood Programme in Nyando District, Nyanza Province, involves training of youths on sustainable agriculture, income generation, and support services to the agricultural sector in Nyando.

National School Feeding Council of Kenya
PO Box 49772 00100, Nairobi, Kenya. Tel. +254 20 608960, email nsfck@yahoo.com

Community-based school feeding programme involves training and facilitating schools and communities around them to produce food towards school feeding, implemented in Maragwa, Bondo and Thika districts. Conservation agriculture components introduced in Maragwa District.

Triple W Engineering Ltd.
PO Box 176, Naro Moru 10105, Kenya. Tel. +254 62 62255, fax +254 62 62272. Contact: T.B. Muckle, muckle@africaonline.co.ke

Design and development of hand/animal-drawn conservation agriculture equipment for oxen, donkeys and camels. All equipment can be made by artisans with simple facilities using locally available raw materials. Training of artisans, production of manuals, and design of light equipment suitable for women and young people.

Madagascar

Groupement Semis Direct Madagascar

South Africa

Agricultural Resource Consultants
PO Box 3474, Parklands 2121, South Africa. Tel. +27 486 2254, +27 486 2274, email agricons@pixie.co.za. Contact: Jim Findlay

Expertise in conservation agriculture throughout Africa, and in registration and legislation of crop protection products.
Department of Agriculture, Western Cape
Tel. +27 21 808 5340, fax +27 21 808 5370, email andrer@elsenburg.com. Contact: Andre Roux
Agricultural research, advisory services and planter modification, especially for farmers who grow wheat and vegetables using conservation agriculture in Western Cape.

Grain Crops Institute
Agricultural Research Council of South Africa (ARC-GCI), Private Bag X 9029, Pietermaritzburg 3200, South Africa. Tel. +27 33 3559410, fax +27 33 3559518, email rmfowler@iafrica.com. Contact: Richard Fowler
Promotion and advice on adoption of conservation agriculture in southern Africa.

Institute for Soil, Climate & Water
Agricultural Research Council of South Africa (ARC-ISCW), Pretoria, Gauteng Province, South Africa. Tel. +27 12 310 2500, fax +27 12 323 1157, email DBeukes@arc.agric.za or Hjsmith@arc.agric.za. Contact: Danie Beukes or Hendrik Smith
Research and advice on principles and practices of conservation agriculture and the establishment of action research-based conservation agriculture projects, especially among small-scale and emerging farmers.

Small Grains Institute
Agricultural Research Council of South Africa (ARC-SGI), Bethlehem, Free State Province, South Africa. Tel. +27 58 307 3400, fax +27 58 307 3519, email KilianW@arc.agric.za or TolmayJ@arc.agric.za. Contact: Willem Killian or John Tolmay
Research and advice on practice of conservation agriculture, especially by dryland wheat farmers.

No-Till Club of KwaZulu-Natal
PO Box 1052, Howick 3290, South Africa. Tel. +27 33 239 1807, fax +27 33 330 6981, email robin.d@absamail.co.za. Contact: Robin Denny
Farmers in eastern South Africa who meet regularly with one another, universities, researchers, advisers and manufacturers to promote conservation agriculture.

Tanzania

Agricultural Research Institute Uyole
PO Box 400, Mbeya, Tanzania. Tel. +255 25 2510062, 2510363, fax +255 25 2510065, email uyole@iad.co.tz, internet www.drd.mafs.go.tz. Contact: Saidi Mkomwa, Team Leader
Seed supply and advisory services (pests, diseases and management) of cover crops. Training services on conservation agriculture equipment and practices.

Ministry of Agriculture and Food Security
PO Box 4192, Dar-es-Salaam, Tanzania. Tel. +255 22 2862003, +255 744 373395, fax +255 22 2862077, 2862003. Contact: R.M. Shetto, Assistant Director, mshetto@yahoo.co.uk
Technical training services for farmers, farmer-farmer trainers and extension agents in mechanization, including conservation agriculture. Facilitation of mechanization input supply through policy adjustments, credit guarantees for farmers, stockists and manufacturers. Networking of stakeholders and dissemination of information on conservation agriculture and general agricultural mechanization.

Selian Agricultural Research Institute (SARI)
PO Box 6024, Arusha, Tanzania. Tel. +255 27250 3883, fax +255 27 250 3971, mobile +255 748 403921, email wlmariki@sari.co.tz, wlmariki@yahoo.com, internet www.drd.mafs.go.tz/northern.htm. Contact: Ali Buana or Wilfred Mariki (CA-SARD Facilitator)
Cover crop seed supply and advisory services (pests diseases and management) of cover crops. Training and advice on conservation agriculture equipment and practices; advice on extension methodologies such as farmer field schools and farmer-to-farmer exchange visits.
Conservation Agriculture

Uganda

Agricultural Engineering and Applied Technology Research Institute
PO Box 7144, Kampala, Uganda. Tel. +256 41 566161, +256 77 220010, email aeatri@starcom.co.ug

Research and adaptation of conservation agriculture, with focus on conservation agriculture equipment. Training on conservation agriculture for farmers, extensionists and rural artisans. Links with private sector manufacturers and academia.

National Agricultural Advisory Services (NAADS)
NAADS Secretariat, Plot 39A, Lumumba Avenue, PO Box 25235, Kampala, Uganda. Tel. +256 41 345065, +256 77874126, fax +256 41 347843

National Agricultural Research Organization (NARO)
PO Box 295, Entebbe, Uganda. Tel. +256 041 320512

Coordination of research on conservation agriculture, including cover crops, tools and implements, soil and water management and fertility issues.

Zambia

Agriculture Support Programme (ASP)
PO Box 510091, Chipata, Zambia. Tel. +260 62 21284, 21379, email scafe@zamnet.zm, sccaestf@zamnet.zm. Contact: R.K. Shula

Conservation Farming Unit, Zambia National Farmers Union
PO Box 30395, Lusaka, Zambia. Tel. +260 1 210112, 264781, 265455, fax +260 1 264781, Contact: Dutch Gibson, email gibcoll@zamnet.zm

The conservation farming unit has been developing and promoting the adoption of the conservation tillage and conservation agriculture technologies with small scale farmers through training, publication of materials to be used, trials and field days.

Golden Valley Agriculture Research Trust
PO Box 50834, Lusaka, Zambia. Tel. +260 1 265455, fax +260 1 264781, email paagaard@zamnet.zm. Contact: Peter Aagaard,

Research trials on conservation farming and conservation agriculture.

Zimbabwe

Agricultural Research and Extension Services (AREX)
PO Box 8117, Causeway, Harare, Zimbabwe. Tel. +263 4 707311/794601, fax. +263 4 730525

Research and extension services on a national scale. Previously known as AGRITEX.

University of Zimbabwe
Dept. of Soil Science, PO Box MP 167, Mount Pleasant, Harare, Zimbabwe. Tel. +263 4 339191, email chuma@africaonline.co.zw, Contact: Edward Chuma

Outside Africa

Alternative Farming Systems Information Center
www.nal.usda.gov/afsic/

Provides access to information on alternative cropping systems, including conservation agriculture.
Confederation of American Associations for the Production of Sustainable Agriculture (CAAPAS)
Email sdrob@idi.com.ar, internet www.caapas.org. Contact: Roberto A. Peiretti, President

Center for Cover Crops Information and Seed Exchange in Africa (CIEPCA)
http://ppathw3.cals.cornell.edu/mba_project/ CIEPCA/home.html

Centre de coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)

For Eastern and Southern Africa: c/o ICRAF, UN Avenue, Gigiri, PO Box 30677-00100, Nairobi, Kenya. Tel. +254 20 722 46 52. Contact: Denis Depommier, denis.deppommier@cgiar.org
For West Africa: 5, Av. Kennedy, 01 BP 596, Ouagadougou, Burkina Faso. Tel. +226 50 30 70. Contact: Jacques Pages, Jacques.pages@cirad.fr

Development of conservation agriculture-based cropping systems and rotations. Environmental and socioeconomic impact of conservation agriculture systems. Participatory innovation development. Case studies on conservation agriculture adaptation and adoption. Training of researchers and extension officers. Partnerships with donors, national institutions and private sector to develop and implement pilot conservation agriculture projects and programmes.

Cornell University-CIIFAD
http://mulch.mannlib.cornell.edu/CAwebsite/
Useful information and resources related to conservation agriculture.

Cover Crops International Clearinghouse (CIDICCO)
http://cidicco.hn/newcidiccoenglish/

CropLife International
143 Avenue Louise, B-1050 Brussels, Belgium. Tel. +32 2 542 04 10, fax +32 2 542 04 19, email croplife@croplife.org, internet www.croplife.org

Global federation representing the plant science industry. It represents a network of regional and national associations in over 90 countries and is led by companies such as BASF, Bayer CropScience, Dow AgroSciences, DuPont, FMC, Monsanto, Sumitomo and Syngenta.

European Conservation Agriculture Federation (ECAF)
CIFA Alameda del Obispo, Avda Menéndez Pidal, s/n, Apdo 3092, 14080 Córdoba, Spain. Tel./fax +34 957 760797, email conservation.agriculture@ecaf.org, internet www.ecaf.org

Federação Brasileira de Plantio Direto na Palha
Rua 7 de Setembro, 800 - sala – 201, CEP 84.010-350, Ponta Grossa, Paraná, Brazil. Tel./fax +55 42 223 9107, email febrapdp@uol.com.br, internet www.febrapdp.org.br

Food and Agriculture Organization of the United Nations (FAO)
Farm Power and Equipment Group, Conservation Agriculture, Viale Delle Terme di Caracalla, Rome 00100, Italy. Tel. +39 06 57053334, 57052612, email agst-mail@fao.org, internet www.fao.org/ag/ags/subjects/en/farmpower, www.fao.org/ag/ags/AGSE/Main.htm,
Conservation Agriculture


Supports and promotes conservation agriculture worldwide. FAO’s “Telefood programme” provides small grants to farmers groups that could be used for cover crop seeds or implements for conservation agriculture. For more information, contact your FAO country office.

German Agency for Technical Cooperation (GTZ)

PO Box 5180, 65726 Eschborn, Germany. Tel. +49 6196 790, internet, www.gtz.de/conservation-tillage

Agriculture sector support and food security programmes.

Land Resources Management, World Bank


LEISA

PO Box 64, 3830 AB Leusden, Netherlands. Email ileia@ileia.nl, website www.ileisa.info

Magazine on low external input and sustainable agriculture

LEXSYS: Legume Expert SYStem

www.iita.org/research/lexsys.htm. Cover crop database has information on legumes, agroecological zones, plant characteristics, etc.

World Congress on Conservation Agriculture

First World Congress (Madrid, 2001): www.ecaf.org/Congress/Latest_news.htm

Second World Congress (Iguacu, Brazil, 2003): www.febrapdp.org.br/event.htm

Third World Congress (Nairobi, 2005): www.act.org.zw/congress/index.htm

Major international conference on conservation agriculture, held every 2 years. Papers available online.

World Overview of Conservation Approaches and Technologies (WOCAT)

www.wocat.net, email wocat@giub.unibe.ch

Database on soil and water conservation, including examples of conservation agriculture.
Equipment manufacturers

Many of these manufacturers also provide training and advice on conservation agriculture equipment.

Brazil

See also www.fao.org/ag/AGS/agse/planters.htm

Fitarelli Máquinas Agrícolas Ltda.
Rua Etelvino Pcs. 30, Bairro Industrial, Aratiba, RS, CEP 9970-000, Brazil. Tel./fax +55 54 376 1168, email fitarelli@fitarelli.com.br, internet www.fitarelli.com.br

IADEL Máquinas e Implementos Ltda
Rua Dona Ana 883, Centro Dona Emma, Santa Catarina, CEP 89155-000, Brazil. Fax +55 47 364 042

Indústria Knapik
Rua Pref. Alfredo Metzler, 480, Bairro Santa Rosa CEP 89400-000, Brazil. Tel. +55 42 522 1819, fax 42 522 2789, email knapik@knapik.com.br, internet www.knapik.com.br

Jahnel Indústria e Comércio de Implementos Agrícolas Ltda.
Rua Benjamini Constant 636, Cuna Porã, Santa Catarina, CEP 89890-000, Brazil. Tel. +55 49 646 0587, email jahnel@cpnet.com.br

Máquinas Agrícolas Jacto SA
Rua Dr. Luiz Miranda 1650, PO Box 35, 17580-000 Pompéia, SP, Brazil. Tel. +55 14 3405 2100, fax + 55 14 3452 1306, email jacto@jacto.com.br, internet www.jacto.com.br
Knapsack sprayers adapted to hand-pulled machines.

Triton Máquinas Agrícolas Ltda
Rua Dois Irmãos 263, Centro, Caixa Postal 31, CEP 89.609-000, Luzerna, Santa Catarina, Brazil. Tel./fax +55 49 523 1144, email triton@tritonmaquinas.com.br, internet www.tritonmaquinas.com.br

Kenya

Lolli
PO Box 63514-00619, Outer Ring Road, next to Hardi, Nairobi, Kenya. Tel +254 20 860782, 802060, fax +254 20 860260

Sametract
Bambur Road, Industrial Area, Nairobi. Tel. +254 20 533081, 533446, 537019, fax +254 20 551475

Techno Plast
Nairobi. Tel. +254 20 551771

South Africa

Afritrac Ltd
South Africa. Tel. +27 11 918 5983 fax +27 11 918 0310, email mike@afritrac.co.za, internet www.afritrac.co.za. Contact: Mike McMaster
Manufacturers and distributors of “Mealie Brand” animal and tractor-drawn planters and other equipment suited for use by small scale conservation agriculture farmers.
Conservation Agriculture

**Northmec/CSE**

PO Box 851, Isando 1600, South Africa. Tel. +27 11 974 2501, 82 896 5236, fax +27 11 392 2889, email stefts@northmec.co.za, internet www.cse.co.za. Contact: Steph Strydom

South African representatives of Case, Baldan, Fitarelli, Jacto and other locally manufactured and imported agricultural machinery for conservation agriculture farmers, large and small.

**Tanzania**

**Nandra Engineering Works**

Nguwu Kazi Area, Sukari Road, PO Box 304, Moshi, Tanzania. Tel. +255 27 51542, fax +255 27 50575, email nandra@eoltz.com. Contact: Frank Alfred Lesiriam (Managing Director)

Animal-drawn rippers and subsoilers, spare parts for rippers and tractors, piloting the manufacture of hand jab-planters and no-tillage equipment. Also maize mills, hullers, grain storage tanks, cookers, water tanks.

**SEAZ Agricultural Equipment Ltd**

PO Box 2607, Mbeya, Tanzania. Tel. +255 744 399599, fax +255 25 2502121, email seaz@yahoo.co.uk. Contact: Vasimbile Sinde

**Uganda**

**Soroti Agricultural Implements and Machinery Manufacturing Company (SAIMMCO)**

Cementry Road, Soroti, Uganda. Tel. +256 45 61361, fax +256 45 61361, email saimmco.soroti@alam-group.com, internet www.alam-group.com/saimmco.html

Manufactures tools and implements for agricultural production and processing. Particularly strong in the manufacture of draft animal power implements. Participated in the field introduction of conservation agriculture in Uganda, and makes implements such as including rippers, subsoilers, no-till planter and manually operated sprayers.

**Zambia**

**Zamwipe**

c/o Fedex, Nangwenya Road, Rhodes Park, Lusaka, Zambia, or PO Box 44, Fringilla, Lusaka, Zambia. Tel. +260 1 264281, +260 1 230112, email zamwipe@zamnet.zm, gibcoll@zamnet.zm. Contact: Dutch Gibson

**Zimbabwe**

**Mealie Brand**

39 Steelworks Road, Steeldale, PO Box 1059, Bulawayo, Zimbabwe. Tel. +263 9 887989, 880667 or 71363/4/5, fax 71365. General information: mdsec@zimplow.co.zw, sales: sales@zimplow.co.zw, internet www.zimplow.co.zw

**Hastt**

PO Box 2356, Harare, Zimbabwe. Tel. +263 4 620321–7, fax +263 4 620371. Enquiries: enquiries@hastt.co.zw, sales: sales@hastt.co.zw, internet www.hastt.co.zw

Equipment development, manufacture and supply for conservation agriculture. Manufactures and supplies rippers and planters for minimum and zero tillage. Product range covers tractor-mounted, animal-drawn and hand-operated equipment.
The following websites have a wide range of information and downloadable documents on conservation agriculture. See the Organizations and websites section above for more information:

- **ACT**, www.act.org.zw
- **ATNES A**, www.atnesa.org
- **FAO**, www.fao.org/ag/ags/AGSE/Main.htm
- **GTZ**, www.gtz.de/conservation-tillage
- **Relma in ICRAF**, www.relma.org

### CDs-ROMs

**CropLife International.** 2004. *Conservation technologies for sustainable agriculture.* CD-ROM. CropLife International, Brussels. Obtainable from Keith Jones, keith@croplife.org

Presentations from a workshop at the 2004 International Weed Science Congress in South Africa. Presentations from FAO, the World Bank, the Kenya Agricultural Research Institute, the International Crops Research Institute for the Semi-Arid Tropics; Sasakawa Global 2000, as well as Bayer CropScience, Monsanto, Dow AgriSciences, and several others.


CD-ROM with training materials. Introduction to conservation agriculture; modules on soil, agronomy, mechanization, pest control, economics, etc.). Useful for training.

### Publications


Series covers various aspects of conservation agriculture.


Study of reduced tillage practices and cover crops for households under labour stress in Babati and Karatu Districts in Northern Tanzania.


**CIDICCO, IITA, and Judson College.** 2002. *Food and feed from mucuna: Current uses and the way forward.* Proceedings of an international workshop. CIDICCO (International Cover Crops Clearinghouse), CIEPCA (Center for Information and Seed Exchange in Africa)-IITA (International Institute of Tropical Agriculture), and World Hunger Research
Conservation Agriculture

Center, Judson College. www.cidicco.hn/newcidiccoenglish/
food_and_feed_from_mucuna.htm


Case studies from around the world showing how the plant science industry is increasing its emphasis on conservation technologies. Draft at www.croplife.org/conservationtech


Posters with pictograms and simple text to assist in sprayer training. Useful for sprayer training and as a reminder for participants.


Case study of conservation agriculture in Ghana.


Good academic synthesis of conservation agriculture.


Case study of conservation agriculture in Zambia.


Liniger, H.P., and W. Critchley (forthcoming 2005). Local responses to global land degradation: Exchange of knowledge for Sustainable Land Management Centre for
Development and Environment (CDE), United Nations Environment Programme (UNEP).

Global overview book with over 30 case studies.


Discussion on soil fertility and related policy issues.

Farmers’ initiatives in land husbandry.
Regional Land Management Unit (RELMA), Nairobi.

Farmers’ innovations in sustainable agriculture.

Repots de synthese campagne. ESA/ SODECOTON, Garoua Cameroun.
Annual report of activities.


Shaxson, F. 1999. New concepts and approaches to land management in the tropics with emphasis on steeplands. 


Technical manual on soil and water conservation.


How to use the Zamwipe weed wiper to control weeds.

Videos


Monsanto Central Africa Inc. Growing together: Conservation tillage in Africa. Video on how partnerships are providing solutions needed to empower small-scale farmer.