Integrated Crop Management Vol. 6 – 2008

An international technical workshop
Investing in sustainable crop intensification
The case for improving soil health

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Investing in sustainable crop intensification:
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FAO, Rome: 22-24 July 2008

PLANT PRODUCTION AND PROTECTION DIVISION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2008

ISBN 978-92-5-106323-1

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FOREWORD

For over 2000 years farmers have believed that they must plough to get a good crop. But the more often the land is ploughed, the faster it loses crucial organic matter and the biotic activity it supports. As organic matter content falls, soils become capped and less porous, losing their ability to absorb and retain water – and this has two bad effects: first, there is less water to support crop growth and the biological activity that is so important for productivity, and second, more water accumulates and moves across the land surface, causing floods and erosion.

Already many farmers, large and small, grow crops in rotation without ploughing, on almost 100 million hectares in countries as diverse as the US, Brazil, Paraguay, Argentina, Kazakhstan, DPR Korea, China, South Africa and Australia. They use the residues of previous crops or of specially grown nitrogen-fixing legumes to create mulches into which seed and fertilizer are drilled directly. This type of no-till farming – or *Conservation Agriculture* as it is now called – is a major component of a greener revolution that will make intensive farming sustainable, cut energy use in food production, decrease agro-chemical contamination of the environment, reduce greenhouse gas emissions, minimize run-off and soil erosion, and improve fresh water supplies.

FAO has been involved through its field programme in the pioneering work on minimum and zero tillage and continues to be active in many countries in all continents in testing, adapting and promoting various approaches to conservation agriculture (CA). The spread over the past 30 years or so of these methods has been significant, but the proportion of global farm land that is managed according to CA principles is still relatively small.

This publication is a report of a Workshop that brought together people from a wide range of institutions - farmers, researchers, extensionists, policy makers, donors – from 40 countries who share a common concern about the non-sustainability of ways in which farm land is now being used and who are convinced that this must change. The Workshop, which was hosted by FAO and the UK Tropical Agriculture Association (TAA), focused on the growing evidence of success in the adoption and spread of CA systems in developing countries in Latin America, Asia and Africa, and on ways of mainstreaming CA principles and practices as a sound basis for increasing productivity while sustaining – and enhancing – soil health, biodiversity and other environmental services. CA-based approaches to sustainable production intensification are highly relevant to the global response to rising food and energy prices, increasing soil and environmental degradation, pervasive rural poverty, climate change and increasing water scarcity.

The consensus of the Workshop was that, using CA, farmers can attain higher levels of productivity and profitability while improving soil health and the environment. The main outcome of the Workshop is *'A Framework for Action'*. This presents the joint thinking of the Workshop delegates on actions that would help to empower many more farmers to take up CA, thereby enabling land to be farmed more productively, profitably and sustainably.

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ACKNOWLEDGMENTS

The Workshop in Rome was the culmination of a collaborative process in which many individuals and organizations participated over several months to ensure its success. Institutions that helped to plan and organize the Workshop event included: TAA, FAO, UNEP, FARA, ICRAF, ILRI, TSBF-CIAT, CIRAD, ACT and KARI. They all deserve special acknowledgment and thanks for their unwavering technical support and for providing working facilities in Rome, Nairobi and the UK during the planning phase.

FAO and FARA underwrote the basic cost of the Workshop and provided funds to cover the cost of speakers from Latin America, Asia and Africa. This support was supplemented by a contribution from the Bill & Melinda Gates Foundation to cover some of the planning costs, and from GFAR to cover additional participants from the developing regions. All remaining participants were self-funded or sponsored by their respective institutions.

FAO's technical support to the Workshop process and its international connections with the Conservation Agriculture constituency were invaluable to the success of the Workshop as was its role as host. FAO's various technical contributions were competently handled by Theodor Friedrich, Eric Kueneman and Josef Kienzle, with support from Peter Kenmore, Parviz Koohafkan, Sally Bunning, Kevin Gallagher and Dominique Lantieri. Without their moral and technical support and their cooperation, the Workshop event would not have happened. Their professionalism and commitment towards sustainable production intensification and their role in FAO in popularizing Conservation Agriculture as a way forward in the developing regions has been truly exceptional.

FARA's moral, technical and sponsorship support provided a special encouragement to the Workshop process. The participation of Monty Jones and Adewale Adekunle in the Workshop planning process and FARA's administrative support through Victor Keraro and Marie Golie all contributed to the Workshop's effectiveness and success.

TAA's leading role in initiating and catalyzing the Workshop process from its very beginning, on the issues related to improved soil management, deserves to be acknowledged. Very special thanks must go to Amir Kassam, Francis Shaxson, Andrew Bennett and Andrew MacMillan from TAA for their dedicated and unstinting support to the cause, and for their help with planning the meeting's Agenda and with the running of the Workshop in Rome.

The planning process also gained a great deal from many colleagues: the contributions from the following are specifically acknowledged: Don Doering (Bill & Melina Gates Foundation), Frank Place and Dennis Garrity (ICRAF),

Denis Depommier and Francis Forest (CIRAD), Adewale Adekunle (FARA), Patrick Gicheru (KARI), Reynolds Shula (ACT), Carlos Sere (ILRI), Stephen Twomlow (ICRISAT), Patrick Wall (CIMMYT), Andre Bationo (TSBF-CIAT) and Akin Adesina (AGRA), Peter Matlon and Ruben Puentes (Rockefeller Foundation), Laurence Cockcroft (Gatsby Foundation), John Lynam (Kilimo Trust), John Barrett and Don Howlett (DFID), Marion Cheatle (UNEP), Mark Holderness (GFAR), Sara Scherr (Ecoagriculture Partners), Long Nguyen (IAEA), John Landers (APDC, Brazil), Bob Boddey (EMBRAPA), Richard Harwood (Michigan State University), and Norman Uphoff (CIIFAD, Cornell University).

There are many people who deserve to be thanked for their contribution to the Workshop through their presentation or serving as session chair or convener, or as rapporteurs or as drafting team liaison persons. In fact, as can be seen from the Agenda, some 60% of the participants were directly engaged in one form or another capacity in running the Workshop process in Rome. They all deserve a special expression of appreciation.

Particular thanks are expressed to all the speakers, session chairs and the rapporteurs of day one of the meeting when the evidence of success and lessons learned with Conservation Agriculture from several countries in the developing regions were presented. Thanks are also expressed to the co-conveners of the three Working Groups, Martin Bwalya and Mark Laing (Field Practice & Development), John Dixon and Nuhu Hatibu (Science & Technology), and Norman Uphoff and Richard Mkandawire (Policy and Finance), and to their respective members, for their balanced contributions to the Action Plan. Similarly, special thanks are expressed to Andrew MacMillan for serving as the coordinator of the Working Group for drafting the Action Plan whose members were Doug Wholey, Will Critchley, Rolf Derpsch, Bernard Triomphe, John Ashburner, Des MacGarry, Patrick Wall, Simon Hocombe and Deborah Bossio. Their enthusiasm and commitment to meeting the drafting deadline for the preparation of the final document *'A Framework for Action'* went beyond the call of duty.

The Workshop secretariat in FAO assisted participants with their travel, visa and hotel arrangements, and was ably managed – before, during and after the meeting -- by Chiara Ventura, with support from Francesca Furino.

Grateful thanks go to Amir Kassam, Francis Shaxson and Theodor Friedrich for leading and overseeing all aspects of the Workshop planning and implementation process, and for compiling this Workshop report.

ACRONYMS AND ABBREVIATIONS

AAB	Association of Applied Biologists, UK
AAPRESID	Asociación Argentina de Productores de Siembra Directa
ACSAD	Arab Center for the Studies of Arid Zones and Dry Lands, Syria
ACT	African Conservation Tillage Network
AGRA	Alliance for a Green Revolution in Africa
APDC	Associação de Plantio Direto no Cerrado, Brazil
BNF	Biological Nitrogen Fixation
CA	Conservation Agriculture
CAADP	Comprehensive African Agricultural Development Programme
CEC	Cation Exchange Capacity
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical
CIIFAD	Cornell International Institute for Food and Agriculture Development
CIMMYT	International Maize and Wheat Improvement Centre
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développment
CoP	Community of Practice
CT	Conservation Tillage
DD	Direct Drilling
DPR	Democratic Peoples' Republic
ECAF	European Conservation Agriculture Federation
EMBRAPA	Empresa Brasileira de Pasquisa Agropecuária
ESAK	Ecole Supérieure dÁgriculture du Kef, Tunisia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAQs	Frequently Asked Questions
FARA	Forum for Agricultural Research in Africa
FEBRAPDP	Federation of No-Till Farmers of Brazil
FFEM/AFD	French Fund for Global Environment/Agence Française de Développement
FFS	Farmer Field Schools
GAP	Good Agricultural Practices
GFAR	Global Forum for Agriculture Research

GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit, Germany
HYVs	High Yielding Varieties
IAEA	International Atomic Energy Agency
IAPAR	Instituto Agronômico do Paraná, Brazil
ICRAF	International Centre for Agroforestry Research
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
INIA	Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria
INRA	Institut National pour la Recherches Agricoles
ILRI	International Livestock Research Institute
IRAD	Institut de Recherche Agricole pour le Developpement
JSWC	Joural of Soil and Water Conservation
IWMI	International Water Management Institute
KARI	Kenya Agricultural Research Institute
MDGs	Millennium Development Gaols
MoA	Ministry of Agriculture
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NRM	Natural Resource Management
OM	Organic Matter
PR	Public Relations
R&D	Research & Development
SARD	Sustainable Agriculture and Rural Development
SARI	Selian Agricultural research Institute, Tanzania
SOM	Soil Organic Matter
SWC	Soil and Water Conservation
SWCS	Soil and Water Conservation Society
TA	Tillage Agriculture
TAA	Tropical Agriculture Association, UK
TAFA	Tany sy Fampandrosoana, Madagascar
TSBF	Tropical Soil Biology and Fertility
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organization

USA	United States of America
UV	Ultra Violet
WB	World Bank
WOCAT	World Overview of Conservation Approaches and Technologies
WWF	World Wildlife Fund