



*Putting nitrogen fixation to work
for smallholder farmers in Africa*

Biological Nitrogen Fixation and Grain Legume Enterprise: Guidelines for N2Africa Master Farmers



**CIAT-TSBF and FORMAT
2010**

Biological Nitrogen Fixation and Grain Legume Enterprise: Guidelines for N2Africa Master Farmers

© CIAT-TSBF

Tropical Soil Biology and Fertility Institute of the International Centre for Tropical Agriculture (CIAT-TSBF), c/o United Nations Avenue, Gigiri; P.O. Box 30677-00100, Nairobi, Kenya, Tel: +254-20-7224755 or +254-20-7224772; Fax: +254-20-7224763; Email: tsbfinfo@cgiar.org; Internet: www.ciat.org/tsbf-institute. The Forum for Organic Resource Management and Agricultural Technology (FORMAT), P.O. Box 79, The Village Market, Nairobi, Kenya. Internet: www.formatkenya.org.

This publication may be reproduced in its entirety or in part for non-commercial application provided that its author and CIAT-TSBF are acknowledged.

Acknowledgement

Helpful comments on this booklet were received from Hakeem A. Ajeigbe, Kenton Dashiell, Nancy Karanja, Ken E. Giller, Bernard Vanlauwe and Judith De Wolf. Funding for this book was provided by a grant to Plant Sciences Group of Wageningen University from the Bill and Melinda Gates Foundation. The findings and conclusions contained in this booklet are those of the author and do not necessarily represent the views of the Bill & Melinda Gates Foundation. Printed by the United Nations Offices in Nairobi, Kenya. Appreciation is extended to all the above for their respective contributions.

Correct citation

Woomer, P.L. 2010. Biological Nitrogen Fixation and Grain Legume Enterprise: Guidelines for N2Africa Master Farmers. Tropical Soil Biology and Fertility Institute of the International Centre for Tropical Agriculture. Nairobi. 17 pp.

The following literature provided important sources of information used to prepare materials appearing in this booklet.

FAO. 1984. *Legume Inoculants and their Use*. Food and Agriculture Organization. Rome.

Giller, K.E. 2001. *Nitrogen Fixation in Tropical Cropping Systems*. Second Edition. CABI Publishing, Wallingford, UK.

Sanginga, N. and Woomer, P.L. 2009. *Integrated Soil Fertility Management in Africa: Principles, Practices and Developmental Process*. TSBF-CIAT. Nairobi.

Singleton P.W. *et al.* 1990. *Applied BNF Technology: A Practical Guide for Extension Specialists*. University of Hawaii NifTAL Project. Paia, Hawaii, USA.

Front cover photographs: top row, left to right, untreated soybean seed, two-step seed inoculation, soybean seed inoculated with rhizobia; middle row, N2Africa demonstration package of BNF technologies, healthy soybean plants, Master Farmer trainers field visit; bottom row, a well-nodulated bean root, farmers receiving a N2Africa demonstration package, improved legume seed and inoculants offered for sale. Photographs by K.E. Giller, S. Koala and P.L. Woomer.



N2Africa is a large scale, research and development project focused on putting nitrogen fixation to work for smallholder farmers growing legume crops in Africa. N2Africa is funded by 'The Bill & Melinda Gates Foundation' through a grant to Plant Production Systems, Wageningen University, in the Netherlands. It is led by Wageningen University together with CIAT-TSBF, IITA and has many partners in the Democratic Republic of Congo, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda and Zimbabwe. At the end of the 4-year project we will have: identified niches for targeting nitrogen fixing legumes; tested multi-purpose legumes to provide food, animal feed, and improved soil fertility; promoted the adoption of improved legume varieties; supported the development of inoculum production capacity through collaboration with private sector partners; developed and strengthened capacity for legumes research and technology dissemination; and delivered improved varieties of legumes and inoculant technologies to more than 225,000 smallholder farmers through our Master Farmer Network. For more information on the project, please visit our website at www.N2Africa.org.



**Putting nitrogen fixation to work for
smallholder farmers in Africa**