

Sustainable Agriculture Reviews

Volume 10

Series Editor
Eric Lichtfouse

For further volumes:
<http://www.springer.com/series/8380>

*Other Books by Dr. Eric Lichtfouse**

Sustainable Agriculture

<http://dx.doi.org/10.1007/978-90-481-2666-8>

Sustainable Agriculture, Volume 2

<http://dx.doi.org/10.1007/978-94-007-0394-0>

Organic Farming, Pest Control and Remediation of Soil Pollutants

<http://dx.doi.org/10.1007/978-1-4020-9654-9>

Climate Change, Intercropping, Pest Control and Beneficial Microorganisms

<http://dx.doi.org/10.1007/978-90-481-2716-0>

Sociology, Organic Farming, Climate Change and Soil Science

<http://dx.doi.org/10.1007/978-90-481-3333-8>

Genetic Engineering, Biofertilisation, Soil Quality and Organic farming

<http://dx.doi.org/10.1007/978-90-481-8741-6>

Biodiversity, Biofuels, Agroforestry and Conservation Agriculture

<http://dx.doi.org/10.1007/978-90-481-9513-8>

Alternative Systems, Biotechnology, Drought Stress and Ecological Fertilisation

<http://dx.doi.org/10.1007/978-94-007-0186-1>

Genetics, Biofuels and Local Farming Systems

<http://dx.doi.org/10.1007/978-94-007-1521-9>

Agroecology and Strategies for Climate Change

<http://dx.doi.org/10.1007/978-94-007-1905-7>

Organic Fertilisation, Soil Quality and Human Health

<http://dx.doi.org/10.1007/978-94-007-4113-3>

Environmental Chemistry. Green Chemistry and Pollutants in Ecosystems

<http://dx.doi.org/10.1007/b137751>

Environmental Chemistry for a Sustainable World

Volume 1. Nanotechnology and Health Risk

<http://dx.doi.org/10.1007/978-94-007-2442-6>

Environmental Chemistry for a Sustainable World

Volume 2. Remediation of Air and Water Pollution

<http://dx.doi.org/10.1007/978-94-007-2439-6>

Rédiger pour être publié ! Conseils pratiques pour les scientifiques

<http://dx.doi.org/10.1007/978-2-287-99396-1>

Call for review articles

Authors wishing to publish a review article in *Sustainable Agriculture Reviews or Environmental Chemistry for a Sustainable World* should contact the Editor.

E-mail: Eric.Lichtfouse@dijon.inra.fr

* <http://www.linkedin.com/pub/eric-lichtfouse/19/493/720>, <http://www.researcherid.com/rid/F-4759-2011>

Eric Lichtfouse
Editor

Farming for Food and Water Security

 Springer

Editor

Dr. Eric Lichtfouse
UMR1347 Agroécologie
AgroSup/INRA/uB
17, rue Sully
21000 Dijon, France

ISSN 2210-4410

ISBN 978-94-007-4499-8

DOI 10.1007/978-94-007-4500-1

Springer Dordrecht Heidelberg New York London

ISSN 2210-4429 (electronic)

ISBN 978-94-007-4500-1 (eBook)

Library of Congress Control Number: 2012942331

© Springer Science+Business Media Dordrecht 2012

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Contents

Public Goods and Farming	1
Catherine L. Gerrard, L.G. Smith, B. Pearce, S. Padel, R. Hitchings, M. Measures, and N. Cooper	
Pesticides and Sustainable Agriculture	23
Patrick Drogui and Pierre Lafrance	
Nitrogen Use Efficiency by Annual and Perennial Crops	57
Corina Carranca	
Microalgae for Bioremediation of Distillery Effluent	83
Nirbhay K. Singh and D.B. Patel	
No-Till Direct Seeding for Energy-Saving Rice Production in China	111
Min Huang, Bing Xia, Yingbin Zou, Peng Jiang, Yuehua Feng, Zhaowei Cheng, and Yali Mo	
Agricultural Water Poverty Index for a Sustainable World	127
Masoumeh Forouzani, Ezatollah Karami, Mansour Zibaei, and Gh. Hossein Zamani	
Participatory Rural Appraisal to Solve Irrigation Issues	157
Albert T. Modi	
Bioavailability of Soil P for Plant Nutrition	177
R.S. Yadav, S.C. Meena, S.I. Patel, K.I. Patel, Mohd. Sayeed Akhtar, B.K. Yadav, and Jitendra Panwar	
Animal Manure for Smallholder Agriculture in South Africa	201
Alfred Oghode Misaiti Okorogbona and Lasisi Olaosebikan Adebisi	
Vermicompost and Soil Quality	243
Supradip Saha, Debashis Dutta, Deb Prasad Ray, and Rajib Karmakar	
Index	265

