

KYUSEI NATURE FARMING AND EM TECHNOLOGY

GUIDELINES FOR PRACTICAL USE



APNAN

Authors

Yasushi Nishibuchi, Yujiro Sano
Jun Matsumoto, Koki Nagamine, Somlak Pongdit

Editor

Ravi Sangakkara



INFRC

Published by

Asia Pacific Natural Agriculture Network, Bangkok, Thailand
and
International Nature Farming Research Center, Atami, Japan

REVISED EDITION

2011

COPYRIGHTS RESERVED

PUBLISHERS

ASIA PACIFIC NATURAL AGRICULTURE NETWORK

APNAN, the little network, located in Kularb Apartments in Saphankhwai, Bangkok, Thailand, was first established in 1989 with 13 member nations, and funded by the International Nature Farming Research Center, Atami, Japan, through the generous support of the Sekai Kyusei Kyo, Japan and Thailand. The mandate given at its inception was to elucidate the scientific basis and validity of Nature Farming and the technology of Effective Microorganisms (EM), which was integrated into the concepts of Nature Farming.

From small beginnings, the network moved on to facilitate research and information, produce EM, advise all interested and train people from all walks of life on the concepts and practical aspects of Nature Farming. The network helped organize major conferences on Kyusei Nature Farming in four continents and was instrumental in presenting the identity of Nature Farming at international forums such as the IFOAM and ISOFAR conferences. The network was also responsible for planting seeds of interest on the technology of Effective Microorganisms in all continents of the world and today EM is being blended into even chemical systems to reduce pollution and to help preserve the environment for future generations, as advocated by Mokichi Okada, the founder of Nature Farming principles.

The network also provides training on Nature Farming and EM Technology to interested groups, using the excellent facilities offered at Sara Buri Kyusei Nature Farming Center, managed by the Sekai Kyusei Kyo of Thailand. Information is disseminated, and the Newsletter developed and circulated thrice a year among a readership spanning all continents. The network is run by a few staff and volunteers and is very efficient in its management of resources. Today it is sponsored by the EM Research Organization of Okinawa, the INFRC of Japan and is supported by the Sekai Kyusei Kyo of Japan and Thailand.

All interested in the work of the network – please contact its office at



**APNAN, Kularb Apartment, 29 Soi Suparat, Phahonyothin Road,
Samsennai, Phayathai, Bangkok 10400 Thailand.**

Phone: +66 2 272 7061

Fax : +66 2 616 6022

Email : apnanmail@yahoo.co.jp

Website: www.apnan.org

THE INTERNATIONAL NATURE FARMING RESEARCH CENTER

The International Nature Farming Research Center, located at Atami, Japan, was established in 1985 with the objectives of enhancing economic stability of farmers and producing nutritious and good quality food for humankind through the promotion of Nature Farming. Thus, the INFRC undertakes research and extension programs on Nature Farming based on the principles of Nature Farming advocated by Mokichi Okada, who stated the importance of respecting nature and conforming to its laws. The importance of allowing soils to exhibit their inherent potential is also a key to the principles of Nature Farming, which is promoted by the INFRC.

Today, the INFRC supports over 1900 Nature Farming units in Japan – both in crops and livestock operations. It also has a research farm at Hata, Nagano where scientists are diligently working towards the validation of Nature Farming. The INFRC also promotes the use of EM Technology to stimulate the soil biota and enhance productivity.

The international activities of INFRC range from being associated with the International Federation of Organic Agriculture Movements (IFOAM), supporting the Asia Pacific Natural Agriculture Network (APNAN) and also research and development in many nations such as China, Laos, Myanmar New Zealand, Bhutan and Sri Lanka.

In the recent past, the INFRC has been accredited to certify organic agricultural products and organic agricultural processed food under the JAS Organic Certification scheme of the Ministry of Agriculture of Japan, which is now promoting Organic Agriculture. Thus, the INFRC is a very dynamic organization working diligently to provide a sustainable system of producing food through Nature Farming, based on principles of Mokichi Okada.

The INFRC can be contacted at:



**International Nature Farming Research Center, 8F, Atami Daiichi Building,
9-1 Taharahoncho, Atami, Shizuoka 413-0011 Japan.**

Phone: +81 557 85 2001

Fax : +81 557 85 3156

Email : overseas@infrc.or.jp

Website : www.infrc.or.jp/english

KYUSEI NATURE FARMING AND EM TECHNOLOGY

GUIDELINES FOR PRACTICAL USE

(Revised Edition 2011)

Copyrights 2011- by APNAN, Bangkok, Thailand and INFRC, Atami, Japan

This manual presents guidelines for the adoption of Kyusei Nature Farming and EM Technology. The guidelines are not intended to be absolute instructions for the use of EM in Kyusei Nature Farming. In contrast, the guidelines stated herein need to be modified and utilized on the basis of diverse environments, available resources and the rates of adoption. The authors and publishers are happy to answer any queries of readers and users of the technology presented in this handbook to meet specific situations.

The publishers wish to state that this Handbook is meant for purposes of research, private study or adoption of the technology presented herein. It is not meant for mass scale production or sale. Hence, as per international copyright laws, no part of this handbook may be reproduced, stored in retrieval systems or transmitted in any form, electronic, mechanical, photocopying, recording or by any other means, without the prior consent of the publishers.

The publishers make no representation expressed or implied with regard to the accuracy of the information contained in this handbook. This is due to the adaptations required in using this technology in different environments with available resources. Hence, the publishers do not accept any legal responsibility or liability for any errors or omissions that may be made in using this technology or for any application of the information presented herein.

ACKNOWLEDGMENTS

The authors and editor express their gratitude to the sponsors of this handbook, the International Nature Farming Research Center, Atami, Japan and its President, Rev. Kiyoshi Amano and Board of Directors for their support and encouragement.

A special note of thanks is made to the President of APNAN, Professor Dr. Teruo Higa, who invented the technology of Effective Microorganisms, for his advise and guidance in preparing this handbook. They also express their appreciation to the late Rav. Kazuo Wakugami for practically demonstrating the benefits and success of the technology stated herein at a magnificent Nature Farm in Saraburi and many other locations in Thailand, from where guidelines were procured to develop this handbook.

Gratitude is also expressed to the President and management of EM Resarch Organization, Okinawa, Japan for providing the services of three authors and for their support to the spread of EM technology in the world through APNAN.

To all others who helped make this handbook a reality, the authors and editor say - Thank you.

Bangkok, Thailand
March 2011

The cover page depicts Nature Farming in practice with EM Technology.

KYUSEI NATURE FARMING AND EM TECHNOLOGY

GUIDELINES FOR PRACTICAL USE

TABLE OF CONTENTS

1.0	INTRODUCTION TO KYUSEI NATURE FARMING AND EM TECHNOLOGY	1
1.1	Ideal agriculture	1
1.2	Microorganisms in agriculture	1
1.3	Soil classification on the basis of microflora	2
1.4	EM in agriculture	3
1.5	Principal microorganisms in EM and their modes of action	4
1.6	Economic benefits of EM	6
2.0	BASIC CONCEPTS IN THE APPLICATION EM AND EM MATERIALS	7
2.1.0	Important aspects of EM	7
2.1.1	EM•1	7
2.1.2	EMAS (EM Activated Solution)	8
2.1.3	EMRW (EM Fermented Rice Rinse Water)	9
2.1.4	EM FPE (EM Fermented Plant Extract)	10
2.1.5	EM 5	12
2.2	EM Bokashi	13
2.2.1	Anaerobic EM Bokashi	13
2.2.2	Aerobic EM Bokashi	14
2.2.3	Bokashi extract	15
2.3	EM Soil Bokashi for seedlings and nurseries	16
2.4	EM Mud Balls	17
3.0	CROP PRODUCTION WITH EM	18
3.1	Rice	18
3.2	Vegetables	20
3.3	Mixed cropping systems	21
3.4	Zero tillage with EM	21
3.5	Seed production with EM	21
3.6	Orchard crops with EM	22
4.0	MUSHROOM CULTIVATION WITH EM	24
4.1	Case study: Mushroom cultivation at the Saraburi Center, Thailand	25
5.0	ANIMAL PRODUCTION WITH EM	26
5.1	General Features of using EM in animal production	26
5.2	EM Bokashi as a feed ingredient	27
5.3	EM•1 for drinking water	27
5.4	Spraying of EM for sanitation	27
5.5	EM for treating animal bedding	27
5.6	EM in septic tanks	28
6.0	EM IN AQUACULTURE	29
6.1	General features of EM in aquaculture	29
6.2	EM application in the culture of prawns	29
6.3	Fish culture with EM	31
7.0	CONCLUSIONS	32

