Bulletin

of the International Union of Soil Sciences

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INTERNATIONAL UNION OF SOIL SCIENCES

Founded as International Society of Soil Science (ISSS): 19-05-1924.
Full Members, Associate Members, Individual Members and Sustaining Members since: August 1998.
A scientific union member of ICSU since: 1993.
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I. Soil Physics
Dr. D. Tessier, Science du Sol, INRA, Route de Saint Cyr, 78026 Versailles Cédex, France

II. Soil Chemistry
Prof.Dr. D.L. Sparks, Univ. of Delaware, Dept. of Plant & Soil Sci., Newark, DE 19717-1303, USA

III. Soil Biology
Dr.J.K. Ladha, I.R.R.I., P.O. Box 933, 1099 Manila, Philippines; Fax: +632-845-0606 or -891-1292.

IV. Soil Fertility and Plant Nutrition
Prof.Dr. M.J. Swift, TSBF, P.O. Box 30592, Nairobi, Kenya.

V. Soil Genesis, Classification and Cartography
Prof.Dr. A.R. Mermut, University of Saskatchewan, Dept. of Soil Science, Saskatoon, Sask. S7N 5A8, Canada

VI. Soil Technology
Dr. P. Rengasamy, Univ. of Adelaide, Dpt. of Soil and Water, Walte Campus, PMB1, Glen Osmond S.A. 5064, Australia.

VII. Soil Mineralogy
Prof.Dr. K. Stahr, Inst. f. Standortlehre u. Bodenk., Univ. Hohenheim, Emil-Wolff-Str.27, 70599 Stuttgart, Germany

VIII. Soils and the Environment
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Bulletin

of the International Union of Soil Sciences

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International Union of Soil Sciences (IUSS)

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CONTENTS

ATTENTION

Important deadlines and information with regard to the organization of the 17th World Congress of Soil Science (WCSS), 14-20 August 2002, Bangkok, Thailand

1. **All chairpersons of Commissions, Sub-Commissions and Working Groups** should send their **reports on inter-congress activities (1998-2002)**, with a maximum of two typed pages, to the Secretary-General at least 6 months before the 17th WCSS, i.e. February 13, 2002. – These reports will be published in the Bulletin before the Congress. – Please observe that no specific activities for the existing Commissions, Sub-Commissions and Working Groups will be organized during the 17th WCSS in Bangkok, besides the scientific symposia.

2. **Elections of chairpersons for new Divisions and Commissions** will take place during the 17th WCSS. For these elections, according to the bye-laws, nominations of candidates have to be submitted to the Secretary-General latest 6 months before the Congress, i.e. February 13, 2002. The exact procedure is described in Bulletin 97, 2000/1, pp 4-19. – If no or not enough nominations are received, the IUSS Bureau will search for suitable candidates.

3. **Elections of new Honorary Members** will take place at the 17th World Congress of Soil Science. Nominations can be submitted by full members (National Societies) to the Secretary-General until 6 months before the Congress, i.e. February 13, 2002. For further information, see Rules: B6.

4. **Further important information** is contained in Bulletin No. 97 (2000/1, pp 4-19, with the new Byelaws of IUSS, including the new scientific structure), and in the Report on the Meeting of the IUSS Bureau, in this Bulletin.

MEETING OF THE MEMBERS OF THE IUSS BUREAU, VIENNA, 14-16 JUNE, 2001.

The following officers of the Union participated:

W.E.H. Blum, M. Jamagne, I. Kheoruenromne, P. Lüscher, G. Petersen, A. Ruellan, D.L. Sparks, S. Theerawong, J.H.V. van Baren.

1. Congress in Bangkok

The Third Announcement has now been published, and 4000 copies were mailed. The Fourth Announcement will be forwarded to those who have sent in their "Intention to Attend". At present about 1450 abstracts have been submitted and the final list of oral and poster presentations will soon be available. Some symposia will be combined or regrouped, because of a very different number of submitted papers. For interesting contributions, which do not fit a Symposium, a slot could perhaps be made in a "Miscellaneous Soil Science Symposium".

Each Symposium will consist of one invited paper, 6-7 oral contributions, and the other presentations as posters for which there is enough capacity at the same day and in the vicinity of the oral Symposium.

The publications will be: all abstracts, list of participants, and plenary papers: in hardcopy and on CD-ROM: oral papers most likely only on CD-ROM. Much work is involved in editing papers. Perhaps some soil science journals are interested in preparing special issues with contributions from the Congress. As some scientists prefer refereed journal articles instead of published Congress papers. It was suggested that the Convenors should make summaries of their symposia immediately after, or even before, the Congress. These summaries should be published as well, as done at the Montpellier Congress. The speakers for the 4 Plenary Sessions have not yet been selected.

With regard to the excursions, the Organizers gave information about the large funding from the Thai Government for those held in Thailand. It is not yet sure if all excursions to neighbouring countries can be held.

The Organizers are pleased with the active cooperation of Symposia Convenors and the Thai Co-convenors, and are convinced that an interesting program can be made available to the participants.

2. Elections of new officers

At the Congress, sufficient time should be available for the election of new officers for Divisions and Commissions. The Working Groups could decide for themselves, either at the Congress or at a meeting of the Working Group. Candidates for an office in a Division and Commission should attend the Congress and present themselves before the election. It is hoped that enough good candidates will be proposed in time, because the list of candidates should be available beforehand. Especially the function of Divisional Chairperson is very important for the successful implementation of the new scientific structure. Perhaps an active search should start for prospective chairs if not enough candidates are put forward until the deadline for nominations (6 months before the Congress). Information about the new election procedures should be published again in the Bulletin. It was decided that at the Congress in 2006, all Working Groups will be closed, and re-start if appropriate. Working Groups should report about their activities and accomplishments during the last 4 to 8 years, if they have not yet done so. These can then be assessed.

It was decided that no meetings of the old Commissions will be held, only the new structure will be taken into account. The Secretary General will prepare a text, to be put at the disposal of all Congress participants, with the regulations of the elections and voting procedures. A list of candidates will also be available at the start of the Congress. A practical ballot sheet was proposed and will be further developed. Furthermore, it was decided that the Bureau will act as Election Committee.

For the final program, the Organizing Committee will take into consideration the suggestions made with regard to the election meeting and the five Council meetings. It was also decided that the first meetings of the new Divisions will be chaired by: M. Jamagne, Division 1; D. Sparks, Division 2, G. Petersen, Division 3 and A. Ruellan, Division 4.

3. Succession of IUSS officers

The Secretary General informed the Bureau that the Search Committee for a new Secretary-General has proposed two names. Names for successors of the Deputy Secretary General and Treasurer have also been received. More nominations are expected.

4. IUSS Bulletin and Website

The discussion was a follow-up of the deliberations at the Inter -congress Meeting of the Council, which took place last year in Bangkok. Since more and more Newsletters, Bulletins, etc. are no longer being sent as hardcopies to members of many societies, and a website taking its place, IUSS should follow this trend. It was earlier decided that the IUSS Bulletin will remain to be printed for members who have no access to the web, for life members, for libraries (50 US$ per year), and for individual subscribers (25 US$ per year).

The website can be placed and taken care of, against payment, at the International Soil Reference and Information Centre (ISRIC), in Wageningen, The Netherlands. The Secretary General remains the editor and is responsible for the contents of the printed Bulletin and the website.

Contacts between the parties involved in this exercise will be intensified and it is foreseen that the first version of the IUSS website will be installed before the end of 2001.

5. Reviews in Soil Science, a new journal

Mrs. Judith Taylor, from Elsevier Science Publishers, presented information about a planned new journal, provisionally entitled "Reviews in Soil Science". This idea was welcomed, and the possibility to become a Cooperating Journal of the IUSS was mentioned. A lively discussion followed, and Elsevier will take some suggestions with regard to the scope, size and content into account. A possible link with the IUSS might be explored at a later date. An editorial board is being established, the editor in chief will be Alfred Hartemink, The Netherlands. Members of the IUSS will get the journal for a low individual subscription rate.
The journal will be presented at the World Congress in Bangkok.

6. Membership and finances of IUSS

As in the past, the financial situation is not bright, but is hoped that at the time of the Congress more national societies have joined the Union, and have paid their dues. Quite a large number of countries are in arrears. The treasurer plans that by 2005 the annual income of the Union has increased to an acceptable level, with which it is feasible to give some financial support to Divisions.
The Chair of the Standing Committee of Budget and Finances will step down soon, and a good successor of Dr. W.R. Gardner should be found. This position is of great importance, also in view of fundraising activities.

7. Prizes of IUSS

Information about the prizes was already published in the Bulletin. There are two prizes: the Dokuchaev Prize for basic (fundamental) research and the Liebig Prize for applied research. Since the Soil Science Society of America knows many prizes, D. Sparks will look through the texts governing these prizes, and will suggest procedures. The Bulletin will contain the final text about the two IUSS prizes, which will for the first time be awarded at the 2006 Congress in Philadelphia.

8. Relation with other sciences

In view of the increased attention given to contacts with organizations in related sciences, the Secre-

tary-General gave detailed information about aims and structure of the International Council for Science (ICSU), of which the IUSS is a Scientific Union Member. Many contacts exist already with other Unions, and it was concluded that these should be intensified. This should also include other international and national organizations, related NGO's, etc. It is up to Divisions, Commissions and Working Groups to lay contacts with prospective cooperating societies, organizations, etc. for joint activities, e.g. meetings and projects.

9. Soil Convention.

Information was exchanged about the different conventions, declarations and charters, in which soil plays a role, end especially about the initiative of the IUCN Commission on Environmental Law, which established the Sustainable Soils Working Group. This Working Group, in which Dr. I. Hannam is the leading soil scientist, investigates the international and national dimensions of the legal protection of soils. A Symposium at the Bangkok Congress will address this important issue.

Vienna/Wageningen, July 2001.
Winfried Blum/Hans van Baren
Based upon the minutes of the Meeting


17
การประชุมวิทยาศาสตร์ทางดินของโลก
World Congress of Soil Science
Congrès Mondial de Science du Sol
Bodenkundlicher Weltkongress
Congreso Mundial de la Ciencia del Suelo
WCSS
2002
14-21 August 2002, Thailand
Soil Science : Confronting New Realities in the 21st Century
E-mail : o.sfst@nontri.ku.ac.th http://www/17wcss.ku.ac.th

THE SEVENTEENTH WORLD CONGRESS OF SOIL SCIENCE

INVITATION

On behalf of The Soil and Fertilizer Society of Thailand, The International Union of Soil Sciences and the Ministry of Agriculture and Cooperatives, Thailand, I would like to confirm our commitment and intention on the organization of the Seventeenth World Congress of Soil Science in Bangkok, Thailand, during 14-21 August 2002. With all the kind cooperation rendered to us by individual renowned soil scientists and organizations, I can promise you that we will have one of the most fruitful and enjoyable Congress.
We look forward to welcoming you at the Congress.

Sompong Theerawong, IUSS President
President, 17th World Congress of Soil Science

CONGRESS THEME

Soil Science: Confronting New Realities in the 21st Century

CONGRESS VENUE

Queen Sirikit National Convention Center, Thailand

CONGRESS DATE

14-21 August 2002

17th WCSS SCIENTIFIC COMMITTEES

Sompong Theerawong, Advisory Member
Irb Kheoruenromne, Advisory Member
Lek Moncharoen, Advisory Member
Amnat Suwanarit, Chairperson
Tasnee Attanandana, First Vice-Chairperson
Supamard Panichsakpatana, Second Vice-Chairperson

Committees on Commissions and Subcommissions

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Sumitra Poovarodom
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Pramuanpong Sindhusen
Manu Srikhajon
Juckgrit Homchan
Bunvong Thaiutsa
Taweesak Vearasilp
Preeda Parkpian
Prapai Chairoj
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Aniruth Potichan, Committee and Assistant Secretary
Kumut Sangkhasila, committee and Assistant Secretary

Central Committees

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Patma Vityakon
Charlchai Tanavud
Chairatna Nilnond
Sathien Phimsarn
Pitayakon Limtong
Phichit Ponsakul
Monkol Panichkul
Kannika Yoothong
Prasat Kesawapitak
Patcharee Saenjan

CONGRESS ACTIVITIES

1. Plenary Session (the 1st day)
2. Symposia of Commissions, Sub-Commissions and Working Groups (Six parallel Symposia each day, half a day for each Symposium oral presentations)
3. Special Symposia and Workshops organized by other Organizations
4. Poster Session (related to 2)
5. Pre-Congress Tours, Mid-Congress Tours and Post-Congress Tours
   - 5.1 Tours in Thailand-Technical and Cultural
   - 5.2 Tours in Asia and Australia
   - 5.3 Special tour programmes for accompanying persons of the participants
6. IUSS Business Meeting: Council Meetings, Meetings of Divisions, Commissions, Sub-Commissions, Working Groups, Standing Committees and other special group meetings

TENTATIVE PROGRAMME

DATE / TIME	*ACTIVITY*
13 AUGUST 2002 (Tuesday)	
1300-2000	On-site Registration
14 AUGUST 2002 (Wednesday)	
0830-1200	On-site Registration
	Opening Ceremony
1330-1730	Plenary Lecture
15-17 AUGUST 2002	
Symposia: Morning Session	
0830-1010	First Part
1010-1030	Break
1030-1150	Second Part
1150-1300	Lunch
Poster Session	
1300-1400	Poster Papers
Symposia: Afternoon Session	
1400-1540	First Part
1540-1600	Break
1600-1720	Second Part
18 AUGUST 2002 (Sunday)	
All day	Mid-Congress Tours
19-20 AUGUST 2002	
Symposia	*Programme*
(Same as for 15-17 August 2002)	
21 AUGUST 2002 (Wednesday)	
Symposia: Morning Session	
0830-1010	First Part
1010-1030	Break
1030-1150	Second Part
Afternoon Programme	
1330-1500	Closing Ceremony
14-21 AUGUST 2002	**On-site registration all day, everyday**

REGISTRATION

1. IUSS Members (350 USD)
2. Non-IUSS Members (400 USD)
3. Young Scientists (150 USD)
   (students under 30 years old with valid institution I.D. card)
4. Accompanying person (150 USD)

- Registration fees (1-3) cover entries to all scientific events at the venue, Congress documents abstracts, Transactions of Symposia and welcome party.
- The accompanying person registration fee (4) covers entries to exhibition at the venue, welcome party and a complimentary day-tour programme.

Late registration: a surcharge of 20% for payment received after 31 December, 2001.

ACCOMMODATION

Hotel Rates

A	100	USD up
B	80-100	USD
C	60-80	USD
D	40-60	USD

For accommodation close to venue, reservation will follow first come first serve basis. (Current exchange rate: 1 USD = 41 TB)

TIMETABLE AND DEADLINES

30 April 2001	Closing date for abstract submission
30 May 2001	Fourth Announcement
31 December 2001	Final date for registration of Authors and submission of papers
31 December 2001	Final date for participant registration without late fee
14-21 August 2002	The 17th World Congress of Soil Science

OFFICIAL AIRLINE

THAI Airways International is appointed the Official Airline for the 17th World Congress of Soil Science and prepared to offer special airfare for participants. Please contact THAI's office in your area for assistance in travel arrangement. It is important to refer to an event code TG02081404 when contacting THAI's office.

COMMISSION I
SOIL PHYSICS

01 Effect of soil structure and properties on prefer-ential flow dynamics and pollutant transport in soils

Stress should be laid on the transport of aqueous solutions and contaminants that can affect soil and water quality and human health. Special attention will be given to combining soil structure data and measurements in order to model water and mass transfer. An important aspect should be to consider soil as a structured and non-rigid material in preferential flows.

Keywords: soil structure, hydraulic conductivity, preferential flow, mass transfer, water quality, contaminants.

Convenor: Hans-Joerg VOGEL
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02 Landscape scale research: methodology, concepts and consequences for soil and water quality

Papers dealing with research methodology according to the scale of investigation and the factors to be taken into account so as to understand and predict environmental problems. Particular attention should be paid to describing soil variability, the processes at this scale and their evolution over time.

Keywords: catchment, field scale, runoff, soil variability, modelling, transport processes.

Convenor: Chris MORAN
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Email: **monkolpa@doa.go.th**

03 Influence of biological activity on soil physical properties

This symposium address the role of biological activity in soil structure formation, degradation and remediation, in relation to soil management practices. Consequences for soil organic matter, and for the development of plant and micro-organisms, in systems subjected to high constrains.

Keywords: soil structure, soil management, micro-organisms, fauna, organic matter.

Convenor: Bev D. KAY
Soil Conservation and Management, Dept. of Land Resource Science, Univ. of Guelph, ON, N1G 2W1, Canada,
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Thai co-convenor: Prasop VIRAKORNPHANICH
Development of Vegetable and Fruit Production in Northeast, Dept. of Agriculture, PO Box 19, Muang, Khon Kaen 40001,
Tel: 66 43 261-306/7, Fax: 66 43 261-308,
Email: ***prasop@doa.go.th***

04 Use of soil data in predicting soil physical properties: importance, limitations and conditions of validation

New concepts and tools have been developed over recent years in order to use soil data for predicting physical properties. Which types of soil data are needed? How to use these data to carry out a diagnosis on soil physical quality? Which are the conditions of validation, according to the surrounding environment, in particular in terms of chemical and climatic conditions and of soil management?

Keywords: water retention, porosity, texture, structure, organic matter, physico-chemical data, clay.

Convenor: Daniel TESSIER
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COMMISSION II
SOIL CHEMISTRY

05 Properties, functions, and dynamics of organic matter in tropical soils

The role of SOM in tropical soils is paramount. In many tropical regions, there is great concern over soil degradation and loss of SOM via erosion processes. This symposium will explore chemical and microbiological aspects of SOM dynamics and processes in tropical soils.

Keywords: C and N cycling, soil degradation, C sequestration, management and dynamics of SOM.

with WG. MO

Convenor: Ladislau MARTIN-NETO
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06 Frontiers in the chemistry and biochemistry of the soil rhizosphere

The chemical and biological processes of the soil rhizosphere are greatly influenced by intense interactions of soil minerals with microorganisms, microbial metabolites, root exudates, and organic components.

Keywords: root exudates, rhizosphere, microbial metabolites, organic acids.

with C. IV; WG. MO

Convenor: P.M. HUANG
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Email: **o.sfst@nontri.ku.ac.th**

07 Effects of soil chemical and biochemical processes on soil global climate change

There is a veritable need to better understand the relationship between greenhouse gas (CO_2 and CH_4) emissions from soils and global change. This symposium will focus on processes of accumulation and decomposition of soil organic matter and propose new techniques and soil management practices to better control organic mineralization and reduce greenhouse gas emissions to the atmosphere.

Keywords: greenhouse gas emissions, minera-lization, SOM decomposition.

with C. VII, VIII; WG. MO

Convenor: Alessandro PICCOLO

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Email: **alpiccol@unina.it**

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Email: **pirm@kku.ac.th**

08 Use of molecular scale techniques in determining contaminant speciation and soil remediation

This symposium will focus on the use of molecular scale techniques, including spectroscopic, microscopic, and others, complimented by macroscopic approaches, to study the speciation, transformation, transport, immobilization, and bioavailability of nutrients, metals, oxyanions, radionuclides, and organic chemicals in the soil environment and impacts on chemical and biological remediation.

Keywords: in-situ spectroscopic and microscopic techniques, mechanisms of soil chemical reac-tions, contaminant speciation and remediation.

with WG. MO

Convenor: Donald L. SPARKS

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COMMISSION III
SOIL BIOLOGY

09 Composition of soil microbial and fauna communities: new insight from new technologies

The proposed session would address new methodologies including molecular techniques linked with taxonomy, function, global distribution, GIS and soil biota for predicting soil type and plant diseases, and the spatial relationships of soil biodiversity to plant communities. In addition, full genome sequences for some important soil microorganisms are becoming available in 2000 and the analysis of this new information should be ready for summarization in 2002.

Keywords: biodiversity, microfauna, mesofauna, taxonomy, function.

Convenor: L. Anne GLOVER

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10 Research to enhance carbon sequestration in soils

This session would include following topics: (1) What level of sequestration can be expected, (2) New advances in C and N dynamics (3) Application of new methods to characterize the molecular-scale nature of SOM. (4) Challenges in measurement and monitoring methods for soil C sequestration, and (5) Regional and larger-scale analyses of strategies for soil C sequestration that include environmental and economic issues.

Keywords: C storage, C sequestration, SOM, N dynamics.

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11 Microbial processes and populations in sub-merged soils

The proposed symposium will bring together expertise in rice soils and wetlands with talks addressing such issues as maintenance and turnover of soil organic matter; effects of fluctuation aerobic and anaerobic microbial populations on nutrient and C dynamics; microbial parameters as indices of soil productivity; and linkages of microbial activity and diversity to rate processes governing organic matter and nutrient dynamics.

Keywords: wetlands, SOM, sustainability, nutrient dynamics.

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12 Manipulating soil microbial and enzymic activities

This symposium will cover following topics : soil ecology and its manipulation; the potential of inoculant technology in the 21st century; microbes and enzymes in bioremediation; advances in rhizobial and mycorrhizal technology; biocontrol agents and their place in the reduction of pesticide usage; manipulation of biogeochemical cycles and the impact of changes in climate and land use; plants and microbes 'designed' to suit soils, climates and consumer needs.

Keywords: microbial inoculant, biocontrol, bioremediation, biogeochemical cycle.

Convenor: R.G. BURNS
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COMMISSION IV
SOIL FERTILITY AND PLANT NUTRITION

13 Management of organic matter for soil fertility improvement in humid tropical environments.
The conversion of tropical rain forest to agricultural land use brings many challenges to the soil scientist. This symposium will offer the opportunity for review of current ideas about the optimal approaches to soil fertility management for the future – comparing the traditional practices of shifting cultivation, the impacts of high-input agriculture and attempts to bring forward practices which combine the best of both.
Keywords: shifting cultivation, organic matter, fertilizers, fallows, nutrient cycling.
Convenor: Bernard VANLAUWE
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14 Soil fertility as an ecosystem concept
The relationships between soil and plant are integral to ecosystem productivity and its sustainability over time. These relationships can be described over a range of scales in time and space (e.g. for a plot, a farming system, a watershed) and are the product of a variety of interacting soil properties and feed-back effects. This concept of soil fertility as an ecosystem property goes beyond the conventional agronomic equation of soil fertility with nutrient availability. The papers in this symposium should explore these issues within the context of sustainable soil management.
Keywords: soil fertility, ecosystem services, nutrient cycling, biota, quality.
Convenor: Michael J. SWIFT
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15 Perceptions of soil management: matching indigenous and scientific knowledge systems.
Many societies have developed particular and detailed ways of describing and relating to the soil – which often go beyond the merely utilitarian. Although Western science tends to promote the idea of a homogenous method the perceptions of scientists from the different 'sub-disciplines' of soil science also vary. This symposium will explore the lessons to be learned from comparing differing concepts of the soil.
Keywords: knowledge, ITK, reductive science, culture.
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16 Mechanisms and indicators for efficient nutrient use through integrated soil management

Integrated soil fertility management, the combined use of organic and inorganic sources of nutrients has been widely accepted as the necessary approach to combat nutrient depletion and promote sustainable agricultural production. Advocacy of the approach assumes an increase in the efficiency of nutrient use but there is little agreement as to indicators of this effect. Nor are the mechanisms whereby it occurs generally agreed. This symposium will review current research on these topics.

Keywords: nutrients, efficiency, immobilization, indicators, INM.

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17 Use of natural nutrient sources and amendments: which, where, when and how?

Natural sources of nutrient, such as phosphate rock, are still under-exploited in many parts of the world, and the value of other amendments such as volcanic ash and sediments tend to be underestimated. This is at least partly to be ascribed to the low nutrient availability of the nutrient in these sources. Papers may report on the results of the monitoring of such inputs, of experiments on the use of such inputs under field conditions and on the development, performance an sensitivity of relevant models.

Keywords: phosphate rock, volcanic ash, sediments, lime, valuation, test, models.

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COMMISSION V
SOIL GENESIS, CLASSIFICATION AND CARTOGRAPHY

18 Anthropogenic factor of soil formation

This symposium is intended to look at the human influence on physical, chemical, and biological characteristics of soils in the past and present from the point of view soil classification, genesis, and use and management including quality loss and degradation. There are many places in the world in which the human influence has changed the soil quality drastically yet these changes are not properly recognized. Marks to identify the kind of human influence on soils will also be part of this symposium.

Keywords: soil genesis, anthropogenic influence, soil classification, soil quality and management.

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19 Soil system and land use

Examples of soil systems; morphology of soil at different scales (from landscape to micro), vertical and lateral differentiation of soil futures, past and present; relationship between soil systems and human activities; the development of human activities according to the soil systems; the transformations of soil systems by the human activities; consequences of soil system transformations; how to discover and represent structural analysis; soil management according to soil systems.
Keywords: soil morphology, structural analyses, soil management, human influence.
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20 Arid and semi-arid soils: records of past climates, carbon sequestration, genesis and management

Genesis of arid and semi-arid soils (especially the formation of calcic, gypsic, and salic horizons); management problems; and the use of these soils for archaeological interpretations are the main focal points of this symposium. The role of arid soils in carbon cycle and carbon sequestration; paleoclimate reconstruction are not well understood in the past and it is the aim of this symposium to bring together soil scientists, geologist and archaeologist to fill the interdisciplinary gap.
Keywords: genesis, formation of calcic gypsic and salic horizons, soil management, archaeology, carbon cycle (sequestration), paleoclimate.
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21 Soil classification, accomplishments and future

Presently there are many national soil classification systems and the World Reference Base. All these systems are developed and enhanced our knowledge of the soil resources. Because these soil classification systems represent and foster our understanding and helps communication on the world soil resources, we need to continue to widen our understanding. The purpose of this symposium is to bring scientists together to examine issues related to further developing and strengthening our understanding of soil classification systems for better use and management of soils.

Keywords: soil classification, soil taxonomy, national soil classification systems, soil classification paradigms.

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COMMISSION VI
SOIL TECHNOLOGY

22 Technologies to overcome rootzone soil constraints

This symposium will discuss (1) the occurrence of soil constraints to agricultural productivity, particularly in subsoils, caused by sodicity, salinity, acidity, poor soil structure, poor biological health and ion toxicities, and (2) management strategies to overcome these constraints and remediation measures including agronomic practices and microbial methods.

Keywords: subsoil constraints, salinity, sodicity, acidity, biological health, ion toxicity.

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23 Models and parametric methods for predicting soil degradation

This symposium will discuss (1) the soil processes leading to its degradation including all aspects - chemistry, physics and biology (2) quantification of the processes (3) modelling the processes and predictive parameters and (4) decision support systems for degraded soils.

Keywords: soil degradation, soil processes, modelling, parameters for predicting soil degradation, decision support system.

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24 Use and abuse of industrial and urban wastes in agricultural soils

This symposium will discuss (1) use of soils and clays for waste management which includes containment, re-use and disposal (2) use of wastes as resources for the improvement of soils and landscapes (3) strategies and policy development in the management of urban and industrial wastes, and (4) diagnosis and monitoring of soil pollution.

Keywords: waste management, re-use, soils and clays, diagnosis and monitoring of soil pollution, strategy and policy development.

with Com. VIII

Convenor: Jock CHURCHMAN
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COMMISSION VII
SOIL MINERALOGY

25 Mineralogy and geochemistry of regolith

The transition of rock to soil is a long lasting sequence of processes. This is especially the case in landscapes of the tropics. Knowledge of neoformation changes taking place in the regolith allows not only a better understanding of weathering processes and mineral neoformation as a consequence of climate and the geochemical environment but also a better insight into the influence of mineralogy and geochemistry on fertility, hydrology, stability and contaminant mobility in soils.
Keywords: weathering, geochemical environ-ment, tropical climate, secondary minerals.
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26 Reaction of soil minerals on changes of climate and land management

Soil minerals are the memory of the soils, left to be recorded through the period of soil development. Climate and land management changes can alter the soil mineralogy as a whole or partially within the soil body. Soil environment changes such as drained acid sulfate soils, secondary saline soils, man made and rehabilitated mine soils affect mineral assemblages of soils including changes in the silicate, oxide, and carbonate in soils.
Keywords: heritage, soil memory, climatic marker, paleoenvironment, mineral stability, equilibrium.
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27 Mineralogy and micromorphology of pedogenesis including isotope methods and dating of soil processes.

The qualitative and quantitative assessment of soil genesis often needs insight into the changes in the nature of pedogenic minerals as well as their arrangement within the soil matrix. In order to reconstruct the conditions of active or past processes isotope abundance in soil minerals may be

used for the assessment of environmental conditions and for age determination. Spectroscopic analysis of soil minerals are also widely used in this field of research.

Keywords: soil genesis, micromorphology of weathering and neoformation, isotope fractionation.

Convenor: Karl STAHR

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28 Soil mineralogy in relation to soil fertility and toxicity

Modern electron optical, spectrometer and microanalytical methods enable soil scientists to identify the minerals that control the solubility and bioavailability of nutrient and contaminant elements. Studies of contaminated soils have identified heavy metal compounds and for heavily fertilized soils the associations of sorbed phosphate with soil minerals can be distinguished. Such information is invaluable in research aimed at managing and remediating soils and sediments contaminated by nutrients and heavy metals.

Keywords: heavy metals, contamination, pollution, microanalysis, sorption.

with Com. II, IV

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COMMISSION VIII
SOIL AND THE ENVIRONMENT

29 Urban and sub-urban soils: specific risks for human health (Urban agriculture)

There is a growing concern regarding the management of urban and sub-urban soils, which has been underestimated. Excess applications of fertilizers, pesticides, and hazardous wastes may have a direct impact on human health, and as sources of soil and groundwater contamination, they create a further risk for human health.

Keywords: urban agriculture, food production, heavy metal, plant uptake.

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30 Food security and land use

World's population now exceeds 6 billion, and continues to increase. The responsibility of the agri-food sector is to assist in developing policies that will ensure safe food availability in a global market, considering that one third of the world's land is presently used for agricultural production. There are therefore very close links between food security and environmental issues that will be discussed in this symposium.

Keywords: sustainable intensive agriculture, productivity index, maximum yield, optimum yield.

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31 Exploring the attitude towards soil and land use

Global issues such as soil degradation and sustaining soil functions in agro-ecosystems bring social aspects to the technical knowledge base of soil science. Indigenous soil knowledge broadens our approaches to use of soils. It is thus important to look at different cultures, and across time in a culture. Have our ideas evolved, and where are we now? Can a study of these differences guide us in confronting these new realities of the 21st century?

Keywords: global land ethic, on-farm research, indigenous soil knowledge, new teaching requirement.

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32 Soil indicators for sustainable land use

Soil indicators are important for assisting decision-makers in the development of policies regarding land use and management. Indicators are also useful for monitoring our progress towards sustainable land use. Such indicators are being developed by several countries and also examined at the international (e.g. OCDE) level. The objective of the Symposium will be to evaluate the progress in the development and use of the soil quality indicators for sustainable development.

Keywords: soil quality, soil functions, soil health, land management.

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SUBCOMMISSION A
SALT AFFECTED SOILS

33 Salt affected soils and the environment

This symposium will address the information on soil salinity including its development and distribution naturally or human induced into agricultural land, surface and underground water; and its impact on the environment. Papers dealing with research methodology, planning and management of salt-affected soils in inland and coastal and their impact on the environment including soil, water, quality, vegetation and crops and living organism are most welcome.

Keywords: salinity, water quality, wetlands, ecology, impact, restoration.

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34 Salinization, water management and policy

Soil salinization in suitable agriculture land has been expanded rapidly due to sea water aquaculture, pumping of underground water, seawater and freshwater irrigation development and mis-agricultural management. The discharged water into surface and underground water need to be properly managed. This symposium will deal with concepts, planning, and management policy, and monitoring technology to control salinization and introduce water management systems.

Keywords: salinization, brackish water, incentives, policy, irrigation, salinity control, modelling.

Convenor: Donald SUAREZ
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SUBCOMMISSION B
SOIL MICROMORPHOLOGY

35 Soil micromorphology to quantify soil structure qualities

The characterization of the soil pore system; the types of soil structure and their changing following agricultural activity and seasons; soil pore system, water retention and water movement; soil porosity as an indicator of soil degradation aspects (compaction, crusting, etc.).

Keywords: micromorphometry, porosity, quanti-fication, soil degradation.

Convenor: Fabio TERRIBILE
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36 Soil micromorphology and submicroscopy for interpretation of soil qualities

Micromorphology as a tool to deduce processes of soil formation and transformation; natural and human induced processes; chronology of past and present processes; influence of processes on soil quality; relation between soil management practices and micromorphological characteristics; micro-morphology and experimental pedology; quanti-fication of processes.

Keywords: micromorphology, pedogenic processes, chronology, micromorphometry.

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SUBCOMMISSION C
SOIL AND WATER CONSERVATION

37 Identification and determination of soil quality parameters to evaluate the sustainability and socioeconomic impacts

The soil and water conservation involve the productivity and socioeconomic development for agricultural sustainability under the specific agro-ecological condition. The parameters to evaluate soil quality should deal with the bio-physical characteristics as well as soil resilience and soil loss tolerance both on theoretical and methodological approaches.

Keywords: soil quality, health, productivity, and environmental functions; total impacts of degradation on soil quality; economic feasibility of restoring soil quality.

Convenor: Sonia Carmela Falci DECHEN
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38 Advances integral modeling to make decision in soil conservation

At this decade, soil information systems for soil conservation is quite essential as well as the integral modeling in soil conservation for decision making. Strategies research should be made on a constructive and innovative direction on the concept of conservation and development for sustainable agriculture.

Keywords: transforming information into decision aids; combining and sharing databases, models, and experiences; science-based and realistic scale conservation planning.

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SUBCOMMISSION E
FOREST SOILS

39 Amelioration of degraded soils through afforest-ation

Vast areas of land which have previously been supporting forests, are degraded. Inappropriate soil management (e.g., heavy machinery), mining, land pollution and inadequate drainage, has caused soil degradation by erosion, changing physical (compaction, reduced infiltration), chemical (salinity, excessive acidity, nutrient losses), and biological (soil C, microbial-activity, mineralization) properties in soils. Amelioration by afforestation is an important issue in 21st century.

Keywords: afforestation, erosion, mining, pollution, compaction, chemical and biological properties.

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40 New developments in the evaluation and management of forest soils

Evaluation of soils for forestry is required for proper selection, establishment and productivity of tree species. Due to limitation in the classical soil survey many recent developments in the field and laboratory techniques have occurred which included: remote sensing, radiometry, IR and NIR spectroscopy, stable isotope analysis. GIS and other land based techniques are used to assess soils on a regional scale. Potential use of these techniques and recent improvements in managing forest soils will be explored.

Keywords: forest management, site evaluation, remote sensing, isotopes, GIS.

Convenor: Partap K. KHANNA
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SUBCOMMISSION G
SOIL REMEDIATION

41 Techniques for remediation of contaminated soils: physicochemical techniques

The symposium will focus on the validation and application of in situ remediation techniques that are based on changing the speciation and mobility of organic and inorganic pollutants in soils. Technologies involving active (e.g. electrochemical) and passive (e.g. use of soil amendments) will be covered. There will be special emphasis on the applications of these technologies under field conditions and how their use relates to current national criteria for soil remediation.

Keywords: soil remediation, electrochemistry, soil washing, soil amendments, field trials, legislation.

Convenor: N. J. LEPP
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42 Techniques for remediation of contaminated soils: biological techniques

This symposium will cover important aspects of fundamental research and innovative technologies for soil remediation, and include both Phyto- and Bioremediation. It will focus mainly on in situ techniques, risk assessment and legislative aspects relevant to bioremediation. Technologies covered will include land farming, composting, biopiling, air-sparging, biofilters, phytoremediation and phytoextraction. Target pollutants include inorganic pollutants, heavy metals, POPs, oils, petroleum hydrocarbons, etc.

Keywords: soil remediation, risk assessment, bioremediation, heavy metals, POPs, oils, petroleum hydrocarbons.

Convenor: Steve P. McGRATH
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WORKING GROUPS & STANDING COMMITTEES

CR: Cryosols

43 Cryosols and cryogenic environments in the 21st Century

This symposium will focus on current research activities relating to Cryosols, with special attention being paid to those activities involving present-day issues such as global climate change at high latitudes and how the management and use of these soils affect the cryogenic environment. Since most Cryosols contain large amounts of carbon and ice, climatic changes and human activities may have a great effect on them. Therefore, future research activities should be directed towards acquiring a greater understanding of these soils and the associated environments in order to provide the information needed to deal with the diverse situations that may arise. The papers

presented at this symposium will provide some indication of where we are and what we need to do to deal with some of the challenges facing us in the future.

Keywords: permafrost-affected soils, cryosols, permafrost, global climate change.

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DM: World Soils and Terrain Digital Data Base

44 Global and national digital data bases on soil and terrain conditions, their compilation and uses

The IUSS Working Group on a World Soil and Terrain Digital Database (WG/DM) has been promoting the updating of geo-referenced information on soil patterns, landform and soil profile data. FAO, UNEP and ISRIC in cooperation with national institutes have produced such material at different levels of spatial resolution, as well as its practical applications. The completion of this effort is now becoming urgent, e.g. in view of the Kyoto Protocol on Climate Change, for up-to-date, reliable and easily accessible information on land conditions. The WG/DM intends to have relevant papers published in a special issue of a peer-reviewed international Journal.

Keywords: digital soil information; carbon sequestration; land degradation; land use planning; food security.

Convenor: Wim SOMBROEK
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GC: Soils and Global Change

45 Soil carbon dynamics and the greenhouse effect

The symposium will discuss state-of-the-knowledge in soil C dynamics in relation to the accelerated greenhouse effect. The principal objective is to deliberate the importance of world soils in the global C cycle in a warmer earth. Specific issues to be discussed include effects on soil C (inorganic and organic) dynamics of land use and management, soil erosion and sedimentation, and desertification control and soil restoration. Ancillary benefits of soil C sequestration, including on-site and off-site benefits, and societal value of C will also be debated.

Keywords: soil organic matter, greenhouse effect, soil restoration, soil quality, carbon seques-tration.

Convenor: Rattan LAL
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LD: Land Degradation and Desertification

46 Land degradation and desertification: confronting the realities of the 21st century

About 33% of the global land surface are subject to desertification. This is about 42 million km^2 and affects more than 1 billion people. By 2020, if appropriate actions are not taken, the number of persons affected will be more than double. Asia and Africa will likely suffer the most. With a reduction of the ability of these regions to be self-sufficient in food, food security will emerge as a major global issue. This will stress more on the land resources including a net drain in soil nutrient resources and will be aggravated by climate change. The Symposium will address these and other issues with suggestions to mitigate the negative impacts.

Keywords: land degradation, desertification, food security, global climate change.

Convenor: Hari ESWARAN
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MO: Interactions of Soil Minerals with Organic Components & Microorganisms

47 Soil mineral - organic component - microorganism interactions and the impact on the ecosystem and human welfare

The objective of this symposium is to provide a forum for interactions among soil and environmental scientists to integrate our knowledge on physical/chemical/biological interfacial interactions in soil systems and their impacts on human welfare which include global ion cycling and climatic changes, biodiversity, biological productivity and human nutrition, geomedicine, biotechnology, ecotoxicology and human health, remediation and restoration technology, and celestial exploration.

Keywords: Mineral - organic component – micro-organism interactions, interactive soil processes, porosity, transformation and transport, biomole-cules, nutrients, pollutants, ecotoxicology, remediation, human health, global changes, space exploration.

with Com. I, II, III, VII

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PM: Pedometrics

48 Development in soil data processing

This symposium will focus on ongoing research results within the framework of pedometrics aiming at presenting the state-of-the-art in soil data processing. Topics include analysis of spatial and temporal variability of soil properties; development of decision support systems; assessment of error propagation; quantification of uncertainty and fuzziness of information and evaluation criteria; soil process simulation modelling; design and evaluation of sampling schemes and incorporation of exhaustively sampled information.

Keywords: soil data processing, decision support systems, error propagation, evaluation criteria, soil process, spatial variability, temporal variability.

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PP: Paleopedology

49 Paleosols as a memory for understanding landscape history and environmental problems

This symposium focuses on unburied paleosols or relict soils formed under a different constellation of soil forming factors mainly a different climate and with it vegetation. The knowledge of their genesis is essential for understanding soil behaviour, landscape history and for a proper appreciation of many modern environmental problems.

Keywords: relict paleosol, paleosol memory, landscape history, environmental problems.

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PS: Paddy Soils Fertility

50 Sustainable paddy soil ecosystem: a global challenge

To discuss and exchange information on the current initiatives on bio-organic farming on paddy soils; to discuss cost-effective and sound technologies to improve productivity of derelict paddy soils; Evaluate the Valuation Techniques for Irrigation Water Use to resolve emerging conflicts on water demand and pricing between agriculture and urban and industrial sectors; to elaborate impacts of expanding the cultivation of paddy soils on food security and global climate change.

Keywords: food security; bio-organic farming; derelict paddy soils; water valuation and management; carrying capacity; environment and global climate change.

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PT: Pedotechnique

51 Manufactured, amended, and intensively tilled soils and substrates

Specific soil and substrate volumes and profiles like urban tree soils, sports grounds, potting soils, dikes, road sides, and revegetated and remediated areas. Measurements and description of initial conditions and source materials, and of final conditions; definition of allowable ranges of properties; development of processing equipment and procedures; optimization of specifications; testing unusual materials that are considered for installation.

Keywords: horticulture, urban horticulture, sports grounds, civil engineering, revegetation, remediation.

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RS: Remote Sensing for Soil Survey

52 Remote sensing for data fusion and GIS as tools in land evaluation and degradation studies

This symposium deals with topics on application of remote sensing techniques to soil and land resources studies. The topics include databases for land resources information, surface modelling, extracting remote sensing data for soil chemical properties, DEM and GIS for soil mapping and combining remote sensing data with field data, changing monitoring, disaster management, multitemporal remote sensing-derived LAI as indicator of land qualities and multitemporal approaches to studies and to achieve sustainable land use.

Keywords: remote sensing techniques, data fusion, surface modelling, DEM, GIS, land evaluation.

Convenor: Michel A. MULDERS
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SM: Environmental Soil Mechanics

53 Coupled hydraulic and mechanical processes in structured soils - a challenge to define sustain-ability

The determination of hydraulic properties of structured soils requires amongst others pore or volume rigidity which neither by mechanical nor by pore water suction effects will be altered. However, natural soil processes like swelling and shrinkage or stress effects may induce soil volume ,

functions, and changes in ecological functions as soon as the internal strength (= history of the soil) is exceeded. During the symposium more detailed information about such coupled processes will be given.

Keywords: soil hydraulic properties, pore continuity changes, pore strength, mechanical stress, volume deformation.

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SP: Soil and Groundwater Pollution

54 Vadose zone management strategies to prevent groundwater pollution

Chemical pollution generated by agricultural, industrial and municipal activities has contaminated soil and groundwater worldwide. Management strategies that target the rooting zone offer opportunities for preventing or limiting groundwater pollution and for soil remediation. The symposium is seeking papers on experimental and numerical modeling techniques that focus on management of the vadose zone. Interdisciplinary contributions among soil physicists, chemists and biologists are encouraged.

Keywords: unsaturated zone, contaminant transport, vadose zone-groundwater coupling, soil remediation.

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SU: Soil of Urban, Industrial, Traffic and Mining Areas

55 Improving knowledge about soils and their functions in urban, industrial and mining areas for a better life:

Humans are establishing a new environment for soils and create new soils. This is most pronounced in urban, industrial and mining areas. In these areas soils will go on to contribute essentially to life quality. We have to improve the knowledge for both: the features of these categories of soils and their potential to fulfill functions. In addition we have to learn more about the special fields of the use of soil information.

Keywords: soil functions, urban soils, industrial soils, mine soils, traffic soils, soil information, soil degradation, soil use, environment and soils.

Convenor: Wolfgang BURGHARDT,
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CES: Education in Soil Science

56 Soil education and public awareness

The symposium will deal with: how to speak about soil on global and interdisciplinary perspectives such as soil in the ecological and human systems, and presentation of examples of education experiences including field works. Specific topics include pedagogical strategies, formation of the teachers, educational role of soil science specialists.

Keywords: soil education, global soil, interdisciplinary approach, soil science teachers, soil science specialist, pedagogical strategies.

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FA: Soil Organic Fertilizers and Amendments

57 Soil properties as influenced by the addition of organic fertilizers and amendments

The Symposium will focus on the influence of organic fertilizers and soil amendments on soil physical, chemical and physical properties, and soil fertility. It will also discuss the effect of these materials on soil development along with environmental issues related to their uses.

Keywords: organic fertilizers, soil amendments, soil properties, environmental issues.

Convenor: Tom SIMS
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58 Soil organic fertilizers and amendments: an outlook on key environmental and sanitary issues

The symposium will encompass the discussion on different aspects of the effect of organic fertilizers and amendments added to the soils. These include the Kyoto Protocol, the role of soil organic fertilizers and amendments on the completion of nutrient cycles, recombinant DNA in soil from the use of organic fertilizers and amendments and the risk of TSE/BSE infection from the use of organic fertilizers made of animal residues.

Keywords: Kyoto Protocol, organic fertilizers, soil amendments, nutrient cycles, recombinant DNA, TSE/BSE infection, animal residues.

Convenor: Paolo SEQUI
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Special Symposium

59 Towards integrated soil, water and nutrient management in cropping systems: the role of nuclear techniques

This Symposium focuses on soil organic matter dynamics and nutrient cycling, evaluation and management of nutrient sources, water management and conservation, soil erosion and sedimentation, plant tolerance to environmental stress, environmental and pollution studies and advances in nuclear-based methodologies and instrumentation

Keywords: fertilizers, isotopes, plant nutrition, soil degradation, soil fertility, water.
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SG: Soils and Geomedicine

60 Comparison of bedrocks, soils, chemical climate and pollution as geomedical factors

Much interest has been shown in recent years on the influence on human health from soil pollution. Less attention has been paid to health problems associated with natural chemical and physical factors of the soil and bedrock. Most frequently these problems are associated with local geochemistry, but influence of climate on the cycling of chemical substances in the environment may also play a significant role. The symposium will discuss the relative importance of these factors to human and animal health.

Keywords: geomedicine, bedrock, soil, health, natural factors, chemical climate, pollution.
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IC: International Soil Convention

61 Soil Convention

A background to the rising interest in the global community of the environmental benefits to soil through the introduction of a global policy for sustainable use of soils and an international envi-

ronmental law instrument; the international actions for furthering sustainable use of soils; progress made in the development of the global sustainable soil convention.

Keywords: sustainable use of soils, soil convention, international environmental law and policy, soil and land degradation, global soil policy, sustainable land management.

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62 WOCAT: World overview of conservation approaches and technologies

A multi-institutional, world-wide programme called WOCAT: World Overview of Conservation Approaches and Technologies was launched in 1992. To date, more than 25 institutions from over 20 countries have joined the WOCAT global network, and about 300 individuals have submitted databases on successful Technologies and Approaches in Soil and Water Conservation. Participants of this symposium will obtain an overview of current WOCAT activities and main results in different countries, with an emphasis on internet online data and on SE Asia.

Keywords: soil and water conservation (SWC), SWC technology, SWC approach, evaluation of SWC, standardised data base, internet online data, decision-support system (DSS).

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AS: Acid Sulphate Soils

63 Acid sulphate soil management in tropical environments

This symposium will examine the management of acid sulphate soils in tropical environments. In particular papers are sought on the short and long-term environmental consequences of the use of these soils for agricultural production.

Keywords: acid sulphate soils, pH, pyrite, acidity, tropical environments.

Convenor: Freeman COOK
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POSTER SESSION

Content of each paper displayed on poster board should include;

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3. Abstract
4. Objectives
5. Materials and Methods
6. Important Findings
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The actual area for display on board is 90 cm (horizontal) x 120 cm (vertical). All characters on board should be legible from a distance of 2 meters.

ABSTRACT

An abstract of 500 words is required for each Symposium paper. The abstract should contain brief note on materials and methods, clear objective/s and highlight/s of the findings and discussion. It is essential since the abstract will be reviewed by the Convenors and members of the Scientific Committee for selection as oral paper or poster paper. Early submission of abstract is advised to facilitate further communication. Author is requested to list three numbers of the Symposia, according to the preference for paper submission. Results of the review will be sent back to the author promptly for further necessary action.

Author/s of accepted papers will be contacted by the Scientific Committee. Each accepted abstract will be given a reference code number for subsequent correspondence.

Submit your abstract now !!!

The abstract should be sent either by Email and an attachment to abstract@17wcss.ku.ac.th or mailed diskette.

ABSTRACT ONLINE

For online scientific registration please visit our Congress Website at ***http://www.17wcss.ku.ac.th.*** Our supporting Website is the society's Website at ***http://www.sfst.org.*** For abstract format, the following rules must be observed:

- E-mail attachment to ***abstract@17wcss.ku.ac.th*** in one of the following formats: **MS Word 95, 97 or 2000** (earlier versions of Microsoft Word are acceptable)
- **Times (New) Roman script; left and right margins spaced at 30 mm; top and bottom margins at 35 mm**
- **Title in English**, bold 18 point letters, centred, maximum 2 lines
- **Surnames of the author/s** in bold, 12 point capital letters, **first names** in bold 12 point letters. **Name of the author presenting the paper at Congress, must be underlined**
- **Institution/s** and **Full address/es** of author/s in 12 point letters, authors' titles not necessary to be included
- **Text in English,** 12 point letters, with single spacing between the lines, justified**. A maximum of 500 words in single A4 page (210x297 mm)**
- **Maximum of 6 Keywords in English**

THE 17th WCSS TOURS

I. PRE- AND POST-CONGRESS TOURS

Specific details of the tours will be provided to those who register. Late applicants to tours may have to pay a surcharge of 20% and registered participants who cancel after the cut-off date will be charged 20% of the tour cost. Tours will be cancelled if a minimum number of participants have not registered and paid. Registered participants of cancelled tours have the option to change to another tour or the money is refunded.

A – Pre-Congress Tours
B – Post-Congress Tours

A1, B1: Northern Thailand Tours

Duration: 6 days, 5 nights. Itinerary: Bangkok - Phetchabun - Sukhothai - Lampang - Chiang Mai. (Distance: approximately 1,000 km).

The excursion will emphasize the diversity of the regions beginning from the Central Plain via Pasak valley to the North. An important soil in the Central Plain is the acid sulfate soil. Management of these soils has been a major challenge. Just north of Bangkok, reclamation of an acid sulfate soil for orchard farming will demonstrate some of the successes that have been achieved. The Pasak valley is characterized by a different landscape with soils derived from basic igneous rocks. These soils are intensively cultivated. Further north, the highlands of Pitsanulok and Chiang Mai present other land use and conservation problems. The area is greatly affected by human activities and mitigation technology to reduce land degradation will be demonstrated. Traditional and cultural systems are very important to the region and participants will have an opportunity to appreciate how these affect land use and management. Historical and cultural sites like Sukhothai Historical Park, a world heritage center, handicraft manufacturing, elephants at work, hill tribe villages and ancient temples provide a glimpse of the traditions and heritage of the region.

Cost of each tour: Single US$ 700, Double US$ 600 per person.

A1- Northern Thailand Tour starts in Chiang Mai and ends in Bangkok from 8 August 2002 to 13 August 2002. Price does not include flight to Chiang Mai.
B1- Northern Thailand Tour begins in Bangkok and ends in Chiang Mai from 22 August 2002 to 27 August 2002. Price does not include return flight to Bangkok.
Arrangements can be made for participants who would like to prolong their stay in Chiang Mai or arrive earlier.

A2, B2: Northeast Thailand and Laos Tours

Duration: 6 days, 5 nights. Itinerary: Bangkok - Buriram - Udon Thani - Nong Khai - Vientiane (Laos) (Distance: approximately 850 km). Both tours (A2, B2) start from Bangkok. **A2** 8 - 13 August 2002. **B2** 22 - 27 August 2002.

Known as Isan in Thai, the Northeast presents diversity in terms of landscapes and soils, land use, history and cultural heritage. From Bangkok to the Northeast Plateau, we will visit orchard farming on typical Acid Sulfate Soils of the Bangkok Plain, a dairy farm, and pasture as well as rugged limestone landscape and soils at the escarpment front. On the Northeast Plateau, the tour presents different kinds of landscape, soil type, land use and management. The region consists mainly of sedimentary rocks formed during late Cretaceous to Triassic. Typical sandy soils, lateritic soils, and salt-affected soils

will be observed and management problems evaluated. Locally Tertiary basaltic terrain is present with different kind of landscapes and soils. The famous Mekong River, bordering the Northeast and Laos, is a highlight of the tour. Historically, the river was the lifeline of communities along its banks, aspects of which can still be observed. Along the tour, different kinds of native vegetation like Dipterocarp and dry evergreen forests that are constantly being reduced through shifting cultivation and a variety of land use types including paddy rice, annual upland crops, and tree crops will be shown. This is also one of the few places in the world where inland salt harvesting is taking place and the economic and ecological dimensions of this will be presented.

Isan – the golden gateway to Indochina, is also a region of fascinating historical interest. Stunning and amazing, the largest ancient Khmer style stone temple, a world prehistoric archaeological heritage center of Ban Chiang, and a well-preserved site of dinosaur fossils are among major Isan attractions. At Nong Khai province, a boat trip along the Mekong River will be arranged to enter Laos.

Cost of each tour: Single: US$ 800, Double: US$ 700 per person. (NOTE: Tour price does not include cost of return flight to Bangkok. Participants must have visa for Laos).

A3, B3: Southeast Thailand Tours

Duration: 4 days, 3 nights. Itinerary: Bangkok - Pattaya - Chantaburi - Ko Chang Island – Bangkok (Distance: approximately 400 km). Both tours (A3, B3) start and end in Bangkok. **A3** 10 - 13 August 2002. **B3** 22 - 25 August 2002.
This gem of a tour combines the study of landscapes, soils and agriculture with urbanization and industrialization along the southeast coast. Leaving Bangkok, we will traverse the Bangkok Plains with acid sulfate soils where land-use on one of the most acid soils of the world will be presented. The undulating granitic uplands present another major land-use problem. Intensive cassava (tapioca) cultivation is associated with some of the most extensive soil erosion problems and efforts to contain this will be demonstrated. The tour will spend a night at Pattaya, an unrivalled beach resort with its fine sand, blue sky and limpid sea. However, the negative impacts of tourism are also readily evident. Further to the east, other aspects of land use and management on the granitic terrain will be shown. Near the gem-capital of Chantaburi, a sandy soil with spodic horizon will challenge conventional theories on soil genesis. This is followed with a project on coastal zone management for aquaculture and mangrove conservation. Gem mining from the colluvial material derived from weathering products of Tertiary basalt will be visited along the trip to Chantaburi and impact on land is demonstrated. The area is famous for its fruits and a variety of fruits will be presented for tasting. The fruit culture dates back to several Centuries and this long tradition has been maintained and enhanced. The last night is at an island resort that requires a short ferry ride to reach. The Koh Chang National Marine Park may have less social life when compared with Pattaya, but it affords a tranquil escape amid idyllic surroundings.

Cost of each tour: Single: US$ 500, Double: US$400 per person, and the cost includes last night in Bangkok. Arrangements can be made for persons wishing to spend additional days at Koh Chang.

A4, B4: Southern Thailand Tours

Duration: 5 days, 4 nights. Itinerary: Bangkok - Hua Hin - Surat Thani - Phang-nga – Phuket. (Distance: approximately 950 km).

Peninsular Thailand is the neck of land connecting continental Thailand with the Malay Peninsula. The backbone is formed by granitic hills whose uplift also resulted in the exposure of sedimentary rocks like shale and sandstone. On the western coast, limestone hills form the classical tropical tower-karst

topography. These haystacks are present inland and also dot the shallow waters of the Andaman Sea, giving a surrealistic charm unchallenged in the world. The Pleistocene coastal areas are speckled with peat and mangrove swamps. The people, to diversify the agriculture and maximize the productive capacity of the land have exploited the combination of landform, climate and soils. Plantation agriculture dominates the southern part with rubber, oil palm, coconut, and fruit trees being the basis of the agro-economy. The coastal platform is also abundant with marine life, which is being managed for human consumption. Deforestation, urbanization, tourism, and mismanagement of land cumulatively threaten the environment.

The Southern Thailand Tour is designed to present a glimpse of tropical weathering and soils, the agriculture, and the land-people interaction. The land/sea interface is an integral part of the life of the coastal inhabitants. Tourism along the coast and erosion in the uplands is threatening this fragile balance. Solutions to sustainable development are generally elusive and some will be presented. Participants will have an opportunity to study the change from rock to soil via the pallid, mottled zones, and geomorphic transformation of the land. Soils on recent marine and fluvial terraces, including wetlands show the diversity of soil resources and conditions of the region. Highlights of the tour include visits to plantations, supra - aqueous ecosystems, village in the sea, and the "island in the sun - Phuket"

Cost of each tour: Single: US$ 600, Double US$: 500 per person.

A4 starts in Phuket on 9 August 2002 and ends in Bangkok on 13 August 2002.
B4 starts in Bangkok on 22 August 2002 and ends in Phuket on 26 August 2002.
Arrangements can be made for participants wishing to stay additional days at the island resort of Phuket. Cost of flight from or to Bangkok not included in the price.

B5: Taiwan Tour

Duration: 7 days, 7 nights from 22 August 2002 to 28 August 2002. Itinerary: Bangkok - Taipei - Ilan - Hualien -Taitung - Kengting - Kaohsiung

From North to east and then to South of Taiwan, passing through the volcanic national park, tectonic plate gorge national park, tropical national park, and beautiful seashore landscape, the tour will cover a wide landscape conditions. The tour will travel from sea level to about 3,000 meters, to demonstrate soils and land use developed from a subtropical to sub-alpine humid forest climates. Despite the small size of the island, there is a tremendous diversity in ecosystems. It will show the effects of climate, vegetation, geology and geomor-phological factors on the differentiation of major soils. Highlights include volcanic soils (Andisols), Inceptisols with placic horizon, Spodosols on steep slopes, Histosols in the high mountains, Mollisols and Vertisols on the alluvial terraces, and Ultisols and Oxisols on older sediments. This differentiation has consequences on land use and ecology. The tour will also focus on different agricultural, forestry and pastoral activities and reveal the touristic and cultural richness of the regions, including the representative songs, dance, and scenic sites.

Cost of the tour: Single US$ 1,200, Double US$ 900 per person. Price does not include cost to and from Taipei. Participants must have visa for Taiwan.

B6: Yunnan Tour

Duration: 6 days, 6 nights from 22 August 2002 to 27 August 2002. Itinerary: Bangkok - Kunming - Wang Jai - Yuanmou (Soil Forest) - Minority Village - Kunming (Distance: approximately 1,200 km).

A frontier province in the southwest of China, Yunnan, straddles the Tropic of Cancer.

The SHASEA (Sustainable Agriculture in South-East Asia) research team is investigating the effectiveness of soil conservation treatments validated in plot experiments in actual field conditions. This is being achieved by the development and scientific evaluation of modified and novel cropping practices in a representative highland catchment in northeast Yunnan. The Wang Jia Catchment covers 57.2 hectares near Kedu, in Xundian County, northeast Yunnan, The project consists of an evaluation of the effects of modified cropping practices on maize productivity and soil properties. Selected soil conservation treatments have been implemented in the catchment and the environmental and socioeconomic impacts of environment management are being assessed. Evaluated effects include physical, chemical and ecological impacts, the conservation of natural resources, management of wastes, returns for stakeholders, poverty alleviation, income augmentation and rural development. This holistic approach has not been attempted previously in the regions. The catchment is being used as an experimental area and training model for sustainable agricultural development in the South China highlands. Wang Jia is representative of about 85% of upland Yunnan and typifies the Yunnan countryside.

"The Three Forests of Yunan", namely, the Stone Forest in Lunan Yu, the Soil Forest in Yuanmou and the Sand Forest in Luliand, are well-known for their exotic picturesque landscapes which will impress you forever.

Cost of the tour: Single: US$ 800, Double: US$ 700 per person. Price does not include flight to and out of Kunming. Participants must have visa for China.

B7: South - Western Australia Tour

Duration: 5 days, 4 nights from 22 August 2002 to 26 August 2002.

This tour will focus on soils and issues of particular importance in southwestern Australia. The region experiences a Mediterranean climate but due to the widespread persistence of Tertiary lateritic soils there are many unique problems for soil scientists involved in land management, agriculture, forestry, hydrology, contamination science and mineral exploration.

21 Aug. Arrive in Perth, accommodation in a city centre hotel, welcoming dinner at central restaurant;
22 Aug. Depart Perth for Darling Range to view bauxite laterites, deep weathering, bauxite mining and mine rehabilitation. Opportunities to walk in native eucalyptus rainforest and observe wild flowers. Return to Perth.
23 Aug. Depart Perth for Wundowie, Bakers Hill and York to view the dissected laterite terrain of the intermediate rainfall zone. Plain topics will be pedogenesis, salinisation, land degradation and remediation, silcrete and ferricrete formation and soil fertility. Return to Perth.
24 Aug. Depart Perth and travel north via soils on marine and terrestrial sediments. Visit Cervantes to view the Pinnacles a dramatic landscape of calcrete pillars in a mobile coastal dune field. Visits to irrigated horticulture enterprises and an agricultural research farm to examine soil constraints to productivity. Return to Perth.
25 Aug. Depart Perth and travel south via the Swan Coastal Plain inspecting soils developed on alluvium and coastal dunes. The soils range in age from Recent to Tertiary and consequently exhibit a diverse range of pedological features. Mineral sands mining on ancient strand-lines will be visited with associated land rehabilitation including man made wet-lands for migratory birds. The premium wine growing area of Margaret River will be visited to relate wine quality to soil conditions. Return to Perth.
26 Aug. End of tour; depart Perth.

Cost of the tour: Single: US$ 800, Double: US$ 700 per person. Price does not include travel to and from Perth. Participants must have visa for Australia.

B8: Philippines Luzon Island Tour

Duration: 6 days and 5 nights from 22 August 2002 to 27 August 2002. Itinerary: Metro Manila – Mt. Pinatubo - -Banaue rice terraces - -Los Banos - -Manila. Distance: approximately 1,200 km.

As a consequence of the 1991 explosive volcanic eruption of Mt. Pinatubo, major potions of deposits on the surface of hills and mountains were mobilized due to heavy rains from 1992 up to 1999. Since then, the Lahar affected agricultural areas have continuously been rehabilitated by the Department of Agriculture to restore its productivity.
On the way to Banaue we can see the grassland plains configured by the rolling hills, while rice fields are on the valleys and alluvial plains. There is a zigzag road where the rain swept eroded mountains could be viewed. The slow climb accents the continuing problem of erosion not only of the mountains on one of the sides but also of the riverbanks on the other side. The Banaue Rice Terraces considered as one of the Eight wonders of the world covers an area of about 40,000 hectares which was constructed 2,500 years ago. Essentially, the system is based on the construction of stonewalled terraces along hilly slope to conserve soil and water. The rice terraces are within the province of Ifugao, which is in the Cordillera Central Range. The uplift was greatly affected by diastrophism faults from northwest to northeast. At the southeastern side of the Cordillera, the volcanic formation consisting primarily of andesitic-basaltic pyroclastic flow deposits.

The International Rice Research Institute (IRRI) is located in Los Banos, Laguna, at the foot slope of Mt. Makiling, a dormant volcano. We expect the travel to be very long and tedious, but exhilarating and challenging. It is worth the effort and educational.

Cost of the tour: Single: US$ 700; Double; US$ 600 per person. Price does not include flight to and from Manila.

A5: Peninsular Malaysia Tour

Duration: 6 days, 5 nights from 8 August 2002 to 13 August 2002. Itinerary: Kuala Lumpur – Lumut – Ipoh – Penang – Bangkok.

Peninsular Malaysia, with liquid sunshine, is an example of vegetation, soils and land use in a humid tropical climate. With no dry season, the dominant process of continuous leaching and weathering. The unique character of the soils and the specific land use results from this special agro-environment. A significant part of the wealth of the country comes from the plantation agriculture of mainly rubber and oil-palm with smaller contributions from coconut, and other crops. Padi rice dominates the lowlands. Forest ecosystems comprise natural and managed and these provide a variety of forest products. Malaysia is known for its production of tin; other mineral resources are in lesser quantities.
The tour traverses the agriculturally better developed west coast, starting from the capital and passing through tin-mining areas and ending in Penang. The Rubber Research Institute is a world's premier institute for this crop and participants are briefed on recent technology and will be able to evaluate two of the rubber-growing soils of the country. Moving northwards along the coastal plain, the landscape changes to oil-palm and coconut cultivation. Soil constraints and aspects of management of these crops will be presented. Close to Penang is the large rice-growing area of Malaysia. Staff of the rice research station will present research on all aspects of rice management. Rice soils are messy and participants must be prepared to have dirty boots. These soils seldom dry out and the effects of continuous water-logging with only an occasional oxidation of surface layers, presents unique features to the soil. Discussions during the tour will focus on environmental impacts and other constraints to agricultural development in the country. The tour ends in the metropolis of Penang, an island where participants may have difficulties in leaving.

Cost of the tour: Single: US$ 700, Double: US$ 600 per person. This cost includes accommodation/ transport and drink/food but not dinners. It does not include cost of airfare from Penang to Bangkok.

B9: Sabah Tour

Duration: 6 days and 5 nights from 22 August 2002 to 27 August 2002. Itinerary: Bangkok – Kota Kinabalu (via Kuala Lumpur) – Sandakan – Lahad Datu – Tawau – Kota Kinabalu.

Tropical rain forests and the highest mountain (Mt. Kinabalu) in S.E. Asia are the unique features of the State of Sabah, Malaysia. The selected route traverses the cross-section of the country, passing through virgin jungle, with occasional small communities and ending in the eastern part of the State, which is the new agricultural domain. Agricultural systems from traditional slash and burn to modern plantations can be seen. Landscapes and soils vary with the lithology and geomorphology. Native flora and fauna are fascinating and the participant will be able to share a banana or two with an orangutan. If lucky, they may see the dancing of the king cobra. Soils, ranging from recent alluvials, Andisols on basalts, Oxisols (some with a net positive charge), and Ultisols on ultrabasic rocks will be seen. Crops include rice, cocoa, oil-palm, and spices. Home gardens grow a variety of fruit trees and flowers. The tropical jungle may be viewed from sea-level up to about 13,000 feet. The summit of Mt. Kinabalu provides a most picturesque view that you do not want to miss.

Cost of the tour: Single: US$ 700, Double: US$ 600 per person. Price does not include travel to and from Kota Kinabalu. Participants must have visa for Malaysia.

II. CONGRESS DAY TOURS

During the congress, six special daily tours will be conducted in Bangkok and surrounding areas. These tours offer not only an amazing variety of touristic spots but also scientific interests. So, while you are in Bangkok and have a full-day break during the Congress, why not spend it to visit some of the wonderful sites Bangkok and its vicinity has to offer.

C - Congress Day Tours

C1: Acid Sulfate Soil Area and Ancient City

Stretching north of Bangkok is a vast area of Acid Sulfate Soils, which is worthy to visit since it has been utilized not only for agriculture but also urbanization and industrialization. Tour will also include a visit to Ayutthaya Ancient City and the Royal Summer Retreat of Bang-Pa-In, a fairy tale scene of architectural wonders. Ayutthaya was the Thai capital for 400 years until its destruction in 1707. The ruins of numerous temples offer wonderful scenery and are now one of the world heritage sites.

C2: Mangrove Forest, Shrimp Farm, Salt-Making Field, Floating Market and Home-made Sugar from Coconut

Just southwest of Bangkok, there occurs a wide strip of active tidal flats adjacent to the upper part of the Gulf of Thailand. Originally, Tropical Mangrove Forest occupied these areas. To date, they have been opened to various uses and undoubtedly such human activities affect soil and ecosystems. During the trip, we will visit a shrimp farm, salt-making field, mixed orchard farming and coconut orchard on raised-bedding, and traditional factory for making sugar from coconut juice. Included in the tour, is a visit to the bustling floating market and view typical Thai life on the canals — these are unforgettable experiences.

C3: Rose Garden, World's Tallest Buddhist Monument, Sugarcane Bowl and the Bridge over River Kwai

The highlight of the tour is the visit to the famous Bridge over the River Kwai. Allied Prisoners Of War during World War II built it. We will also visit a variety of interesting places like Rose Garden, a country resort, cultural center and beautiful theme park, and the Phra Pathom Chedi, the world's tallest Buddhist pagoda. Also en route are the vast areas of sugarcane plantations on alluvial fans with well-drained Alfisols. If time is available, we will visit a typical sugar factory located along the levee of the Maklong River.

C4: Temple and City Tour

This tour features visits to the Royal Grand Palace, the uniquely impressive residence of Kings chosen by the first monarch of Chakkri Dynasty; the dazzling Wat Pra Kaew and its revered Emerald Buddha, and Wat Arun (Temple of Dawn) and its impressive 280 feet pagoda decorated with colorful Chinese porcelain. The tour will be complimented with the Chao Phraya River cruise to witness traditional Thai houses, temples, hotels and towers along the river while enjoying fine luncheon. The tour will conclude with a shopping trip to Jim Thompson Thai House, a unique house of the legendary silk merchant, which contains collection of art objects displayed in a traditional Thai House setting.

C5: Degraded Land Improvement Project and Pattaya

On the east of Bangkok, there occurs Khao Hin Son Royal Development Study Center, initiated by His Majesty the King. At the center, we will visit the degraded land improvement project. Een route is Wat Yan Na Sung Worn, where 15 years ago, the land was degraded by severe erosion and supported very few plants. With great efforts, the area has been developed for recreation and faith. The tour will conclude at the Pattaya beach resort, a colorful and vibrant place that offers a lazy time at the beach and an enormous variety of water sports or on-shore entertainment.

C6: Acid Sulfate Soil Area, Vertisols Region and the Ancient City of Lop Buri

The trip commences with a site at Wang Noi, where an acid sulfate soil has been utilized for paddy and orchard farming under the Chao Phraya irrigation project. Further north from the Bangkok Plain is the rugged area of limestone, Terra Rosa, Mollisols and Vertisols that are exclusively used for various upland crops. From there the tour will conclude with Lop Buri where some remarkable ruins dating from the pre-Thai Khmer period and from 17^{th} century are located and where King Narai held court. Historically, Lop Buri is one of the most intriguing towns in the whole of Thailand.

The cost per person for each special day tour is US$ 50. The tours will leave the hotels at 7.30 a.m. and return by 6.00 p.m.

GENERAL INFORMATION ON THAILAND

Climate

Thailand enjoys a tropical climate with 3 distinct seasons- summer from March through May, rainy with plenty of sunshine from June to September and cool from October through February. The average annual temperature is 28° C, ranging, in Bangkok, for example, from 30° C in April to 25° C in December. The average temperature in August is 28° C

Passport

A valid passport is required for all people entering Thailand. Passport must be valid for longer than the period of stay in Thailand.

Visas

Temporary visitors to Thailand for the purpose of pleasure who are exempted from applying for entry visas, and who can stay for a maximum of 30 days in Thailand, must be of the nationality of and holding valid passports of travelling documents issued by:

Americas	: Argentina, Brazil, Canada, Mexico, and USA
Asia	: Bahrain, Brunei, Indonesia, Israel, Japan, Kuwait, Malaysia, Oman, Philippines, Qatar, Republic of Yemen, Saudi Arabia, Singapore, The Union of Myanmar, Turkey, and United Arab Emirates.
Pacific	: Australia, Fiji, New Zealand, Papua New Guinea, Vanuatu, and Independent State of Samoa
Africa	: Algeria, Djibouti, Egypt, Kenya, Mauritania, Morocco, Senegal, South Africa, and Tunisia
Europe	: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, and UK

Language

English is widely understood particularly in Bangkok where it is almost the major commercial language. English and other European languages are spoken in most hotels, shops and restaurants, in major tourist destinations, and Thai-English road and street signs are found nationwide.

Currency

The Thai unit of currency is the baht. The baht is divided into 100 satang. Copper coins are valued at 25 and 50 satang. Silver coins are in denominations of 1 and 5 baht. A 10 baht coin is composed of both silver and copper. Banknotes are valued at 10 baht (brown), 20 baht (green), 50 baht (blue), 100 baht (red), 500 baht (purple) and 1000 baht (grey).

CORRESPONDENCE

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http://www.17wcss.ku.ac.th
Please also visit the Soil and Fertilizer Society of Thailand Website at http://www.sfst.org

INTERNATIONAL UNION of SOIL SCIENCE AWARD COMMITTEE
IUSS LIEBIG AWARD for APPLIED SOIL SCIENCE

A. Status: Special Committee

B. Composition and Tenure:

The award committee is composed of five persons, including the Chair. The committee is made up of the chairs of CIP, CSS, CST, The President, Secretary General. The term of service on the committee is for eight years. The Chair, is the chairperson of CIP.

C. Functions:

1. To encourage nominations for the award.

2. To become familiar with the guidelines and procedures for the awards and to be responsible for seeing that all nominations fulfill the required criteria of eligibility for the award.

3. To evaluate nominations and to select from among those nominated the most outstanding nominee for the award. The committee does not need to make a selection if it feels no candidates of sufficient quality are nominated.

D. Procedures:

1. The IUSS Secretary General distributes the nominations to the committee members and advises them of the scoring or ranking procedure to be followed. The Chair transmits any special instructions to the members.

2. The Chair reports the results of the committee's selection process to the President.

3. The President presents the award at the IUSS general meeting. The Chair provides the statement to be read at the presentation.

E. Secretary General Responsibilities:

The IUSS Secretary General:

1. Cooperates with the committee in its activities, as appropriate or in response to need.

2. Notifies the committee directly or via the General Awards Chair of all deadlines on award selection, annual report, etc.

3. Receives and takes action directly, or by referring to the IUSS Executive Council, as appropriate, all suggestions and/or recommendations for action from the committee.

F. Description of Award:

The IUSS Liebig Award is presented to recognize outstanding work in the area of applied soil science/pedology. The award consists of a certificate and an honorarium of $1,000.

G. Awards Criteria:

The principal criteria for choosing the recipient are demonstration of excellence and creativity in applied research or in applying research findings to solutions of problems in soil science/pedology; soundness of reasoning ability and/or technical skill; originality and significance and evidence of impact of achievements in the soil science/pedology profession or the information-using community.

H. Format for Nominations:

A format guide, approved by the IUSS Executive Council is published in the Bulletin of the IUSS issued each year. The Chair and committee members shall receive a copy of this guide at the time it is mailed from the IUSS office.

1. Eligibility of Nominations:
   Nominations for this award are accepted only from individual active members of the IUSS. Members of the Executive Council and members of the award committee are not eligible to submit nominations.

2. Eligibility of Nominees:
   Membership in the IUSS is required for this award. The award is intended, however, to recognize outstanding achievement in the area of applied research for person with active years ahead. Contributions on which the nomination is based must have been made within the past 10 years.

I. Scoring or Ranking Procedure:

Nominations are ranked by all committee members. One?half of the total number of award nominees (x) are ranked 1 thru x with the rest of the nominees given x + 1. Each member's ranking is conveyed in writing to the Chair, who totals the points received by each nominee. The award recipient is the nominee receiving the lowest score. The Chair may vote in all selections, but the Chair's selections must be made before seeing the selection of other members. The award need not be presented in a given cycle if it is judged that nominees do not meet the criteria.

J. Revising Guidelines or Procedures:

The award committee may recommend changes or revisions relative to criteria, description, and selection process of recipients, etc., for this award. All recommendations must be approved by the IUSS before said recommendations may be implemented. It is preferable to submit recommendations through the Chair. However, recommendations may be submitted through the President or directly to the IUSS Council.

THE INTERNATIONAL
HUMIC SUBSTANCES SOCIETY
Twentieth-Anniversary Conference

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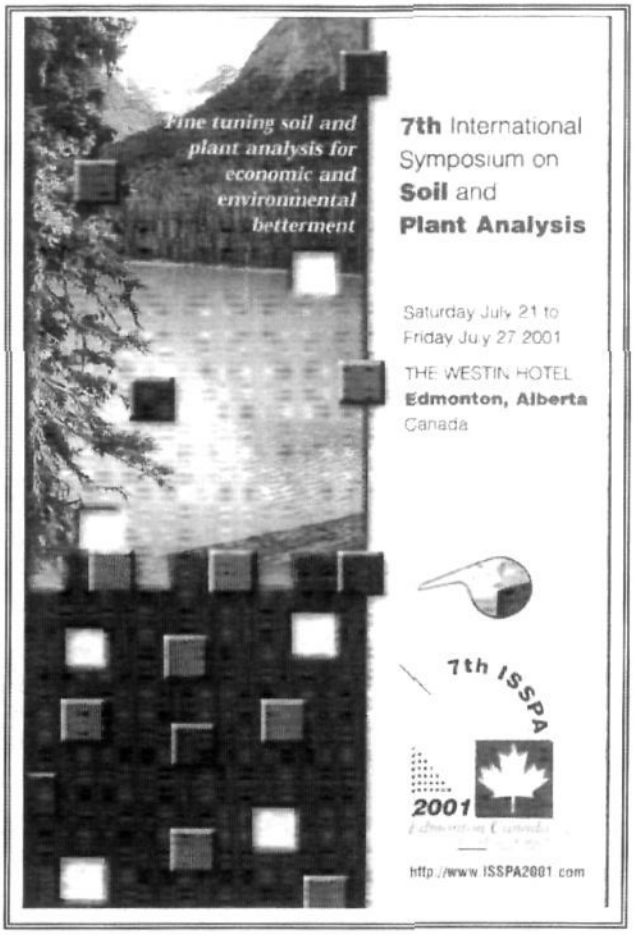

The 7th International Symposium on Soil and Plant Analysis will be held at the Westin Hotel, 21-27 July 2001, in Edmonton, Alberta, Canada.
This Symposium will bring together agricultural, forestry, and natural resource scientists / managers, chemists, fertilizer industry representatives, and others to disseminate information on methodology, terminology, interpretation and application of soil, plant and water analysis for the purpose of efficient resource management, sustainable production and environment protection.

PLENARY SESSIONS

Proficiency testing for soil and plant analysis
Soil acidity
Economic and environmental aspects of soil and plant analysis
Diagnostic methods
Advanced analytical technologies and instrumentation
The Program Committee invites you to submit abstracts of papers reporting unpublished research related to one of the Symposium's plenary session themes for presentation as posters. Abstracts will be reviewed by the Program Committee. There will be a separate area assigned for poster presentations. Abstracts of contributions should be sent to the Symposium Secretariat. For multiple authors, provide complete details for reaching the primary author (name, title, affiliation, address, phone, fax numbers, and email address). If your paper is accepted, we will automatically send you guidelines for preparing posters and manuscripts.
For further information regarding Symposium registration, workshops, tours and accommodation, please visit our web site (www.isspa2001.com) and/or contact the Secretariat (palmmail@convservices.de).

Down to earth

Why soil — and soil science — matters. millennium essay

Dan H. Yaalon

Many ancient religions recognized the importance of soils, and their customs evolved into a spiritual attachment to the life-giving Earth. But surprisingly, ancient and classical scholars did not study the nature of soil. Early scientists also ignored it. For instance, the famous naturalist Alexander von Humboldt (1769–1859), a founder of plant geography, never compared the soils of the several continents on which he studied the distribution of plant species. This attitude still crops up frequently. The *Fontana History of the Environmental Sciences* (1992) contains no mention of soils as a branch of environmental science, although other Earth sciences are included. Is soil just dirt, too commonplace for mention or study?

I am a pedologist — an Earth scientist focusing on the origin and distribution of soils in relation to the history of landscapes. We have much to learn about non-arable soils, and must try to integrate our knowledge into a holistic view of the Earth's dynamics and biogeochemical transformations. Soils are economically and socially important. They can even have beauty: the soil scientist Hans Jenny (1899–1992) was enchanted by the soils depicted in paintings. To paraphrase Leonardo da Vinci: why do we know more about distant celestial objects than we do about the ground beneath our feet?

New ideas about the nature and origin of soils emerged only in the second half of the nineteenth century. V. V. Dokuchaev (1846– 1903) and E. W. Hilgard (1833–1916), both mineralogists and chemists by training, recognized in their soil surveys that climate, vegetation and substrate were all important, and saw the importance of soil horizonation — the development of different layers of soil parallel to the surface — in representing and elucidating a landscape's history.

Dokuchaev had imperial backing in Russia, and several distinguished followers; Hilgard, although a respected university professor in the United States, was not favoured by the establishment. An opportunity to promote his ideas was lost when J. W. Powell and he failed to establish a geological–agricultural (soil) survey in the US Geological Survey. Language barriers hindered communication between soil scientists, and the spread of knowledge was painfully slow, even after the new Russian pedogenetic ideas were present-ed at world exhibitions and translated. Gradually, topographical and biological effects, and the duration of soil-formation processes were all recognized as equally important factors in soil evolution. It took more than one generation before C. F. Marbut (1863–1935) included the concepts of external and internal environmental effects on pedogenesis in the influential US Department of Agriculture soil survey, established by Milton Whitney in 1899. When Jenny submitted his now-classic book on the 'five soil-forming factors' and the quantitative approach to single-factor soil-forming functions, it was at first rejected for publication. It took five years before the book was eventually published in 1941. The importance of soils as a life-support system and in the production of food and fibre was duly recognized. There were spectacular achievements, helping to feed the ever-growing population. Nowadays, most of the 50,000 soil scientists work in agronomic institutes, studying the composition and dynamics of soils in ever greater detail. Yet less than 5% of the global agricultural research budget goes on soil research. The use of soils in road building, construction, ceramics and the cement and aluminium industries is another area where a basic knowledge of soil and landscapes is important. Technological institutes promote this study, which is anchored in ancient practical applications. Soils teem with life. The Nobel laureate Selman Waksman (1888–1973) isolated streptomycin from soil biota, and the preser-vation of pedodiversity and biodiversity may aid similar research in the future. Also, it seems plausible that biological evolution was influenced and constrained by the properties of the soil environment, an attractive field of unexplored research. For Earth scientists, ancient and buried soils are one of the better proxies for reconstructing past climate and the development of the landscape. But it is as the transformer, regulator, buffer and filter of water, nutrients and other dis-

solved and dispersed compounds that soils are most important to humankind — a focal and connecting link between the biogeochemical cycles of the Earth and the dynamic atmospheric system. In the conceptual wiring diagram of the International Geosphere–Biosphere Program the soil system, especially its carbon dynamics, is the central link between the physical climate and biogeochemical systems. It is therefore a major route to understanding and predicting the effects of human actions on the Earth.

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Publish or Perish (5) – Soil science for business

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Money is like muck, not good except it be spread
Francis Bacon (1561-1626)

1. Introduction

There are many trends in the world of science and unravelling these trends and quantifying their effects on society is difficult, but a challenging activity. Science has delivered extraordinary goods and services for the benefit of mankind. Indirectly, or directly, science has brought wealth and an enormous improvement in living standards for many people on this earth. Of course there are people who have not benefited from scientific progress and there are also others who have only experienced the disadvantages of scientific progress. The net effect is, undoubtedly, that science has provided welfare to mankind. Soil science has contributed to this by delivering a major input to the increase in agricultural and food production, but soil science has also made significant contributions to the environmental, earth, and biological sciences.
A striking trend that occurred in the past decades is that soil science and money have become entwined as the commercialisation of society has unquestionably become an integral part of science. I am not fully sure where and when it started in Western Europe, but it is likely that the economic recession in the 1980s and the privatisation of governmental institutes and services that followed, have been instrumental in tightening the link between soil science and business. There are two aspects in the commercialisation of soil science, which deserve special attention and that is the external funding of research and the publishing of scientific results. These are related and are discussed here, but because this article focuses on "Publishing in Soil Science" I will specifically discus about the publishing aspects. As with previous articles it is meant to stimulate and provoke discussion, and thus far that has not been a roaring success. I should mention that the views expressed are entirely my own and they do not necessarily reflect the views of ISRIC.

2. External funding of soil research

An increasing amount of research in soil science is externally funded through industry, private companies but also semi-privatised governmental organisations as well. The pros and cons of this trend have been discussed elsewhere (Bouma, 1997; Mermut and Eswaran, 1997; Ruellan et al., 1997; Tinker, 1985), and here it suffices to mention that the discussion has scientific, financial, political, and emotional aspects. If 10 soil scientists would be asked to give their opinion about this trend, it would be relatively easy to collect an equal number of opinions. If we strictly look at the scientific relationship between soil science and money one could argue in two distinctly different ways.

Total freedom and competition
Some people advocate that the best soil science is conducted in total freedom, when the researcher has almost unrestricted grants and research personnel. Only in such environments scientific breakthroughs are created, since the scientist does not have to bother about bi-monthly reports to the funding organisation or the writing of research grants which is time-consuming and often fruitless. The overall idea is to let soil scientists do what they are best at (investigate the soil) and let others arrange such condi-

tions so that the scientists can do the job. How nice this would be, but I am afraid it is an utopia. Although many soil scientists would know well how to handle a bag of money and research personnel, other might be terribly wasting it by unceasingly moving into dead research allies. This is likely the case since so many people have entered the world of soil science for whom soil science is merely a profession and not a way of life (Phillip, 1991). For many soil scientists it is "soil science for money/salary" and not so much "soil science for pleasure or society" or soil science as a way of life, as the late John Phillip viewed it.

On the other end, there is the arena of total competition where money is distributed following applications and where grants have severe restrictions. This is where "soil science for business" rules. Only the best will have little difficulties to reach their goals and take care of the interests of their clients. By its very nature, that interest is practical and the soil science applied. It may yield some new insights, models or applications, but sooner or later progress will get jammed and no more advancements are being made. In quite some countries soil science has moved in this direction and it is amazing how little has been written on the quality and quantity impact of this movement on the society. A problem with externally funded research is that it restricts freedom of the researcher to make unrelated side investigations and it can also cause problems when it comes to publishing and accessibility to the research data. There are many examples in other branches of science where these problems are cropping up.

Conclusions?

Being conclusive on this matter is impossible for there are success and failure stories from both ends of the spectrum. I personally do believe that restrictions are good. The evidence comes, for example, from the works of Johan Sebastian Bach (1685-1750) who had to compose with restrictions. Like most Baroque composers Bach was extremely productive (in the 1720s he wrote one cantata per week) but more importantly his work is amongst the most beautiful that mankind has ever made (or as someone once said: "Bach almost persuades me to be a Christian"). So Bach proves to me that restrictions do not necessarily mean that nothing brilliant is being produced. In his case one could probably argue that if those restrictions had not existed we might not have so many cantatas, passions etc.

Fig. 1

Johan Sebastian Bach (1685–1750). Not quite known for his soil science contributions but one of the most admirable composers who produced much of his work under severe restrictions with brilliant results that will last for as long as man will exist.

Besides restrictions, external funding also means competition and I probably can best quote Bertrand Russell (1872-1970) who stated: "..I do not think that ordinary human beings can be happy without competition, for competition has been, ever since the origin of Man, the spur to most activities." (Russell, 1949). He thought man should not attempt to abolish competition but only make sure that it takes forms which are not too injurious. There is no doubt that external funding encourages competition but then one could ask whether recognition and appreciation are equally good in getting the most out of people. For a brilliant scientist restrictions nor competition are necessary but for the average it may be most useful and even essential.

If we now return to soil science and the trend of external funding, the question arises how soil science makes the greatest advancements and at the same time significant contributions to society: total freedom or funding with severe restrictions. The best situation is somewhere in between where there is an adequate funding for research without direct gain or application, and sufficient competition for more applied work, provided that the fundamental and applied research are properly linked. We can start pondering about what is sufficient, what is applied and what is a good ratio between applied and fundamental research. This has to be clearly indicated by soil science community and not by those who sit on the money. Funding in soil science involves the soil scientists, the funding agency (government, industry), and the clients or users of the soil science (farmers, industry, government etc.). Soil scientists should clearly indicate who needs what for which activity, and for a start they need to indicate more clearly what the impact of their activities will be. We produce thousands of soil science publications per year but virtually none of them attempts to quantify our impact. When quantification is established we are in a better position to rigidly oppose or support the externally funding trend. Until that time we will have to "take the money - call the tune" (Satchell, 1992).
Whatever system will evolve in the future, a prerequisite is a certain degree of freedom for individuals to explore new pathways, or as Russell stated: "..a community needs, if it is to prosper, a certain number of individuals who do not wholly conform to the general type. Practically all progress, artistic, moral, and intellectual, has depended upon such individuals." (Russell, 1949). No doubt this also applies to the soil science community.

3. Our journals

Restriction and competition
Although research restrictions and competition have become an important part in the way soil science is conducted , the largest restriction and competition is found when it comes to publishing of research results. All journals have detailed instructions on how a paper should look like and what it should contain. For research papers, guidelines are generally fixed: introduction, materials and methods, results and discussion, but review papers are usually prepared in a less controlled format. No doubt that the mode of presentation has advantages and it has been very successful in the disseminating of soil science knowledge. The advantages outweigh the disadvantage of being robotic and giving little freedom to an author to express original but perhaps not directly necessary thoughts.
I may be wrong but there may be too little space in soil science to express idiosyncratic ideas inside the immediate arena of primary research journals whereas such ideas may be important for the advancement of our discipline. In addition, I cannot think of a soil science journal that would publish this article (that's fair enough), whereas opinion and news articles have a role to play in soil science. There are many soil science newsletters but these have no influence and are barely cited. In summary, there are severe restrictions in the publishing of soil science ideas and research and I think it would be good for soil science if there are journals that occasionally lift those restrictions. Perhaps electronic publishing may bring a change in the rigid formats of scientific publishing. Competition is another important factor in publishing and that exists between journals. An important measure for competition is the impact factor – the annual returning sacred figure for journal editors and publishers.

Commercial and National society journals
Scientific publishing was started by scientific societies and universities. From the 1950s onwards an increasing amount of scientific publishing is being done by commercial publishers, partly because societies and universities handed over their activities to the commercial publishers, and because commercial publishers set-up new journals in response to the rapidly growing number of scientific papers. Fig. 2 shows the increase in soil science and agronomy journals from national societies and commercial publishers in the past century.

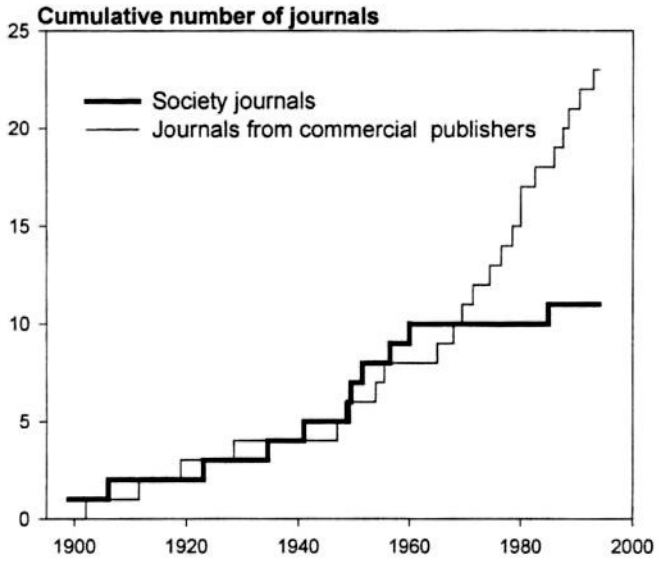

Fig. 1 Cumulative number of soil science and agronomy journal from national soil science societies and commercial publishers. Data from Hartemink (2000) – Table 1.

The firm distinction between soil science journals published by a national soil science society or a commercial publisher is fading. A number of society journals are published by commercial or not-for-profit publishers, such as the European Journal of Soil Science by Blackwell (commercial publisher), and the Australian Journal of Soil Research by CSIRO (not-for-profit).

The main society journals and their impact factors for 2000 and averaged over the years 1991 to 1999 are listed in Table 1. Interannual variation in impact factors can be large so the nine-years average gives a fair indication of the impact of the journals. It does not take into account trends and a recent analysis of the annual impact factors of some of the leading soil science journals has shown that they all increase but that the impact of some journals increases more than others (Hartemink et al., 2001).

Journal	Published by	Impact factor	
		Mean 1991-1999	2000
Soil Science Society of America Journal	National society	1.328	1.401
Journal of Soil and Water Conservation	National society	0.577	0.755
Canadian Journal of Soil Science	National society	0.703	0.597
Australian Journal of Soil Research	National society/not-for-profit publisher	0.914	1.078
Soil Use and Management	National society/not-for-profit publisher	0.607	1.598
(European) Journal of Soil Science	National society/commercial publisher	1.336	1.386

Table 1. Major international soil science journals published by national societies, and the mean annual impact factor over 1991 to 1999 and the impact factor for 2000.

The main soil science journals published by commercial publishers are listed in Table 2, including the impact factors. Kluwer and Elsevier are in command of the major soil science journals, whereas Springer, Dekker and John Wiley are only minor players in the field of soil science. With few exceptions it appears that society journals have slightly higher impact factors than journals by the commercial publishers. This probably has a historical cause as the main society journals are much older and the impact of a journal generally increases with its age.

Journal	Published by	Impact factor	
		Mean 1991-1999	2000
Soil Science and Plant Nutrition	Dekker	0.600	0.522
Communication in Soil Science and Plant Analysis	Dekker	0.416	0.363
Soil Biology and Biochemistry	Elsevier	1.313	1.747
Geoderma	Elsevier	0.836	1.068
Soil and Tillage Research	Elsevier	0.566	0.735
Catena	Elsevier	0.700	1.082
Land Degradation and Rehabilitation/Development	John Wiley	0.320	0.449
Plant and Soil	Kluwer	1.052	1.218
Soil Science	Kluwer	0.945	0.923
Fertilizer Research/Nut. cycling in Agroecosystems	Kluwer	0.399	0.753
Biology and Fertility of Soils	Springer	1.017	1.307

Table 2. Major international soil science journals published by commercial publishers and the mean annual impact factor over 1991 to 1999, and the impact factor for 2000.

The overall trend for 2000 is that soil biology and biochemistry journals have shown a considerable increase in their impact factors. Soil biology is not only in the lift but it seems to become a primary subdiscipline in soil science. For the first time Soil Use and Management has done better than its much older and bigger science brother: European Journal of Soil Science. As mentioned variation is large in impact factors so it may be the other way around again next year. Over the years 1991-2000, the impact factor of Soil Use and Management has a cv of 63% versus a cv of 17% for the European journal of Soil Science. It is conform the general trend that variation in the impact of journals decreases with the age of the journal – see Fig. 3.

The pricing of journals

Scientific publishing is big business. The total market is worth some $10 billion and hugely profitable: margins in the scientific and medical business at Reed-Elsevier are around 35%, compared with and average of 20% for all its publishing interests (The Economist, 10th May, 2001). In a previous article (Hartemink, 1999a), I have shown the difference in price of journals from commercial publishers and national soil science societies. In the past years, largest price increases generally occurred in the journals from national soil science societies. For example, the institutional subscription price for Soil Use and Management increased by 19% between 1996 and 1998 whereas the price of Plant and Soil (Kluwer) hardly changed over the same period – see Table 5 in Hartemink (1999b). Nonetheless, journals from commercial publishers are, on average, much more expensive - both absolutely and per page published than soil science society journals.

The basic problem with the pricing of journals from commercial publishers is that fewer and fewer people have a subscription to the journal leaving the remaining customers to fund the whole system. According to Derk Haank, the chief of Elsevier science section, they first lost all the student subscrip-

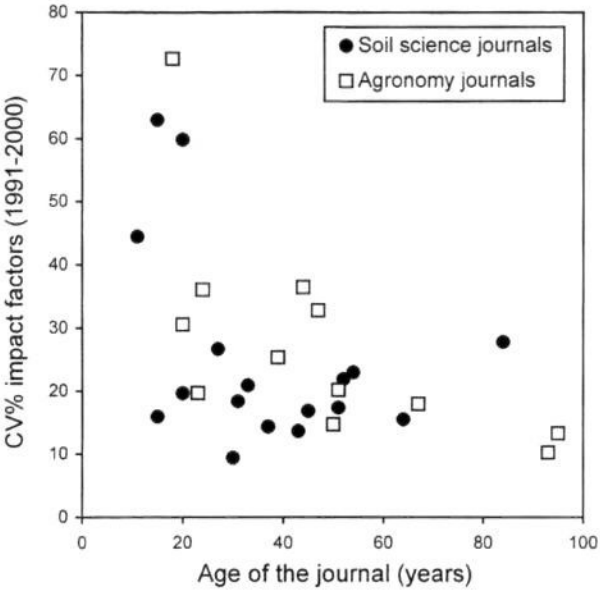

Fig. 3. Relation between age of the journal and CV% of their impact factors over the period 1991-2000. Based on data from 29 soil science and agronomy journals

tions, then those of the faculty staff followed by the marginally interested libraries, and they are now down to the hard core of big libraries but there are only few of those in every field who have to fund the cost of the whole system and that leads to subscription prices of thousands of dollars per year.

I am not an accountant nor economist, but if I am not mistaken, the price of soil science journal is determined by the number of subscriptions and the price of a journal (=income), the production costs (printing, marketing, distribution, personnel) and the profit margin (=difference). Publishers can work a bit on a reduction in costs but have most effect on the profit margin through the price of a journal. National soil science societies may put the profit margin at zero whereas commercial publishers may put it to 35%. The dilemma in the pricing of a soil science journals is well-known: A low subscription price may require page charges in order to break-even. The low price has the advantage of wide circulation and readership in the soil science community and the chance for a high impact. If there are page charges it may imply that authors from small institutes or from developing countries may not be able to publish in the journal thus creating inequity. Such authors may be able to read the journal but cannot contribute to it, and as far as I know only Soil Science (by Kluwer) has currently page charges. Despite these page charges Soil Science keeps increasing its annual subscription rates.

The second option is no page charges with a low distribution, which may influence the impact factor of a journal. The disadvantage is of course that the price of the journal has to be high to compensate for the low number of subscriptions, whereas costs and profit margins may be high. The main advantage is that authors from developing countries can contribute and this applies to most of the journals of commercial publishers.

The discussion on page charge vs no-page charge is essentially a discussion on availability of a journal vs possibility to contribute to a journal. I think a system of no-page-charge is a better system for the possibility to contribute is blocked with a system of page charge. The electronification of scientific publishing, see Hartemink (2000), puts this discussion in another light. Suddenly it is not only subscription which influences availability of scientific information but it is also the infrastructure (computers, telephone lines, fibre cables etc), which determines access to it. Although changes are under

way it still takes ages to download half a megabyte in Los Baños, Bujumbura or Barbados when compared to a download in Brisbane, Bruxelles or Baltimore.
In the end, the electronification of publishing will result in lower costs. Thus a lower price means wider circulation and better access. That is good for soil science and scientific communities. That electronic publishing indeed means wider access and distribution is demonstrated by the results of Elsevier: in 1999 they had about 500,000 subscriptions and the number went down by a few percent each year as libraries had to cancel. Currently with new contracts combining electronic and paper delivery there are more than 700,000 subscribers (Haank, 2001).

Pricing of electronic journals
The question remains what sort of pay model will be made for electronic publishing, and two different models can be envisaged. In the first model the customer, that is the library or institute of the scientist, pays for each download and somewhere in the system a counter is required registering Mbytes or articles traffic. At periodic intervals the university library or institute receives an invoice from the publisher for the number of downloads its staff has made. The second pay model in electronic publishing is a system whereby a fixed amount is paid to the publishers and scientists have unlimited access and abilities to search and download articles.
The first system sounds probably more fair but it may require more administration - hence extra costs although it would be easy to handle the system electronically - and some libraries may put restrictions on the number of downloads, should the periodic invoices become sky-high. In other words, it is more uncertain for both the publishers and librarians whether the user pay system is cost-effective. A fixed payment system therefore seems preferable and is also the way that some of the major commercial publishers are thinking. Another possibility is the author-pay electronic publishing system (Velterop, 2001) and that is discussed below).

4. Criticism on commercial publishers

Recently some renewed but fierce agitation was noticed against the Anglo-Dutch firm Reed-Elsevier following the go-ahead of the American antitrust officials to buy Harcourt General for $4.5 billion. Yes billion. Reed-Elsevier will control some 20% of the science-journal market, and add a further 500 journals to its 1200-strong stable (The Economist, 10th May, 2001). It also means that the Elsevier-Harcourt merger will give one company control over journals representing 42% of a typical university's spending in that area (The Guardian, 26th May, 2001). That leaves the impression that scientific publishing is increasingly controlled by a single publisher. Overall, it should be borne in mind that most universities spend about 1% of their total budget on all literature (books and journals) whereas university libraries spend only a quarter of their budget on literature – the rest is infrastructure.
The Economist, certainly not known for its critical attitude towards business, recently summarised the main criticism on the commercial publishers: (i) the fact that that online versions of journals and their archives are closed to non-subscribers denying scientists an even wider audience, (ii) the complain about the time it takes for a scientist to see his latest through in print, and most importantly (iii) the price increases of the scientific journals.

Some recent initiatives
In response to this criticism on the commercial publishers several initiatives have been taken by the scientific community. For example, in the past years websites have been set-up with free access to journal articles. The most well known is probably PubMed Central which is a digital archive of life sciences journal literature managed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM) – see http://www.pubmedcentral.nih.gov/. It is not a journal publisher and access to PubMed Central (PMC) is free and unrestricted. To date more than 20 journals have contributed material to PubMed Central and it is hoped that many more publishers will be encouraged to contribute to the archive so it can realize its full potential – in ways still to be discovered (Sequeira et al., 2001).

Some argue that with the advancement of electronic technology costs of publishing can be much lower and the balance of payments can be addressed by asking who arguably benefit most – the author – to pay their share in the submission charges (Velterop, 2001). This would be equivalent to the page-charge system in the "traditional journal publishing" with the same drawback: poorly funded scientists can do research but may not be able to publish their result internationally. Nevertheless, there is an increasing interest in the author-pay electronic publishing system (Velterop, 2001; Walker, 2001) with the argument that free online availability increases a paper's impact (Lawrence, 2001).
Another more radical initiative has been that some scientists have argued to stop buying, publishing in or reviewing for any journal of the commercial publishers. I can imagine scientists do not submit their papers to journals from commercial publishers but refusing to review papers from colleagues who have submitted papers to such journals would be hurtful to those colleagues and our discipline in the long-term. Others propose much more rigid changes in which publishers turn into providers of a peer-reviewing service rather than producers of journals (Harnad, 2001). For those who are interested in a more lengthy discussion on science journals publishing (free or fee), it is suggested to check Nature's website: http://www.nature.com/nature/debates/e-access
In soil science we have to face the reality that commercial publishers own many of our respected journals. Any aspiring scientist can put a research paper on his website, but few within the discipline will pay it any attention unless it has undergone the vetting and peer review of a respected journal (The Economist, 10th May, 2001). This situation is not likely to change in the future so we will have to work together with the soil science journals from the commercial publishers. I personally think the right approach is not to run away or block the commercial publishers but to constructively put pressure on the pricing mechanisms they endorse. It can be successful. For example, the American Association of Physical Anthropologists (AAPA) negotiated with Wiley-Liss, the publisher of The American Journal of Physical Anthropology, to reduce the subscription price. Wiley-Liss agreed to cut the journal's annual subscription rate from $2085 to $1390.
According to one of the AAPA members: "The era of very high charges is going to end either with cuts in prices like ours, or with many competing journals owned by associations themselves" (Anon., 2000). So this triumph story shows that dialogue and negotiations should be preferred above boycott. I am not sure whether the dialogue with the commercial publishers has been sufficiently explored by the soil science community and only if it yields nothing tangible tougher measure may be considered to force a better deal for scientists. But there is some good news, which takes some wind out of the sails of those who vividly oppose the commercial publishers.

5. The good news

In the previous section major criticism on the commercial publishers was discussed including how part of the scientific community has reacted to emerging trends. Possibly in response to that reaction, the main commercial scientific publishers have recently made a very good deal for developing countries. In July 2001, six of the world's leading medical publishers pledged to allow free access to their scientific journals to those in the poorest countries who could otherwise not afford them. The six publishers, which own about 50% of the medical journals are Elsevier, Blackwell, Harcourt (also Elsevier soon), Kluwer, Springer and John Wiley (The Guardian, 10th July 2001). The scheme will involve nearly 1000 journals and commence in January 2002 and will last for at least three years. Until now, the subscription prices have been uniform across the world regardless of the ability of some countries to pay for them.
The deal of the medical journals was initiated by the UN-Secretary General Kofi Annan and was brokered by the current WHO director, Gro Harlem Brundtland (from the "sustainability" report). She considers the deal as "..perhaps the biggest step taken towards reducing the health information gap between rich and poor countries" (The Guardian, 10th July 2001). The journals will be available through a protected internet portal at the World Health Organization (WHO) and training will be provided for institutions in developing countries how to access the medical information. Good news!

6. And now soil science?

Following the excellent deal for the medical journals would it be possible to do something similar for the soil science, agricultural and ecological journals? The arguments are straightforward and simple: much of the information is not available in developing countries where agriculture and soil science are of such great importance and where there is such a great need for adequate soil information and literature.

I see two separate ways for a follow up on this initiative: Firstly, free access to the society journals, which are all available on the web. As an example to the commercial publishers, national soil science societies should make their journals freely available to soil scientists in developing countries. It possibly requires some moving and shaking within the national societies and some amendments in the arrangements with the not-for-profit publishers. The national society needs to make a strong plea for this but we do have far more control on the society journals than on those published by commercial publishers.

The second group of journals is those of the commercial publishers and they should be approached in an concerted action. I firmly believe that the IUSS as our global organisation of soil scientists should take this up. Although the IUSS is perhaps not as powerful as the WHO, through the contacts with the International Council for Science (ICSU), of which the IUSS is a full member, this should be endeavoured. Free or reduced price access of the soil science literature would be good for people in developing countries and good for soil science. This is particular the case for Africa which came out from the green revolution empty handed (Keese, 2001). If soil scientists take over Brundtland's initiative on the medical journals as readily as they have taken her ideas and report on sustainability, I foresee a bright future for soil science information in the developing countries.

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NOTEWORTHY

The IUSS Cooperating Journal GEODERMA published its 100th volume. A Special Issue, entitled Developments and Trends in Soil Science, edited by Alfred Hartemink and Alex McBradley was issued to mark this occasion. (Volume 100. nos. 3-4, May 2001).

The journal AGROKEMIA ES TALAJTAN (Agrochemistry and Soil Science) published its 50th volume. The Editor-in-Chief is György Várallyay, who wrote a contribution about the history of this well-known journal. (Volume 50, nos. 1-2, 2001)

International Year of Mountains – 2002

A Big Challenge and a Great Opportunity!

Mission statement
The International Year of Mountains promotes the conservation and sustainable development of mountain regions, thereby ensuring the well being of mountain and lowland communities.

Mountains are fragile ecosystems and are globally important as water towers of the earth, repositories of rich biological diversity, target areas for recreation, and as a hub of cultural integrity and heritage. Occupying about one-fifth of the land surface area, mountains provide a direct life-support base for about one-tenth of humankind as well as goods and services to more than half of the world's population.
In the light of rapidly growing awareness of the importance of mountain areas, the United Nations General Assembly declared 2002 the International Year of Mountains (IYM). FAO was assigned the lead agency role, in collaboration with governments, NGO's, and other UN organizations, in particular UNEP, UNDP, UNESCO and UNU.
Holding the IYM presents both a big challenge and a great opportunity. It should not be considered merely a period of isolated events, but rather as an important step within the long-term process begun at the Earth Summit (UNCED) in 1992 of raising public awareness and ensuring adequate political, institutional and financial commitment for concrete action towards implementing sustainable mountain development. The process should thus reach well beyond 2002. It should be aimed primarily at helping poor and marginalized people living in mountain areas, drawing attention to their cultural heritage. It should also help to conserve or foster the sustainable use of natural resources found in mountain areas.
To ensure IYM success, action on a number of fronts will be required: information generation and exchange; awareness raising and sensitization; promotion conservation and development of mountain resources for the well being of mountain communities; planned, coordinated and effective action; commitment and dedication.
IYM success will require national government action to support the mountain agenda through appropriate policies.
For more information see the homepage: www.mountains2002.org/default.htm. In the mean time, many other entries can be found on the web with information about this important activity!

Quote from the President and Chief Executive Officer of the International Fertilizer Development Center (IFDC), Dr. Amit H. Roy.

Question from the Editor of IFDC Report:
"Dr. Roy, as the year 2000 begins, what do you consider to be IFDC's greatest challenge in the 21st century?"

Answer by Dr. Roy:
"IFDC's greatest challenge must be considered in the context of the greatest challenge that human beings face in the 21st century. That challenge is how to feed the growing population of the world and at the same time preserve and maintain the natural resources on which we depend, especially soil. IFDC realizes that it has a vital role in restoring, to the soil, nutrients that are so vital for increasing productivity of the land. IFDC's greatest strength in this regard is that we not only find the right technology to research but also work with the beneficiaries of these technologies to determine how they can be adopted in their environments. In summary, the greatest challenge of IFDC is to ensure that our natural resource base, especially soil, is preserved and yet is used to double food production, which will be required during the next 25-30 years".

(from IFDC Report, June 2000)

Soil Map of Georgia 1 : 500 000

A new soil map of Georgia has been published in Georgian and English, the scale of the map is 1 : 500 000. The legend includes 49 soil types. The denomination of soils complies with local classification and are correlated with the WRB. There is an electronic version of the map in the format "Shape-file" (other formats are also possible). The Software is ArcView or ArcExplorer.

If you want to purchase the map, please contact
Prof. Tengiz F. Urushadze
E-mail: tengiz.urushadze@mailcity.com
Fax: (+995-32) 99-88-23

The World Resources Institute (WRI) launches a new online source of environmental information

With the hot debate surrounding global warming and finger-pointing about who emits what, how much carbon dioxide does each country actually emit? What countries are increasing their use of renewable energy sources? Is the country you live in likely to have scarce supplies of freshwater by 2025? How much food does your country produce? How many fish are caught? How much forest is left?

Answers to these questions are now available through a free, interactive website developed by the World Resources Institute (WRI). EarthTrends: The Environmental Information Portal provides the most comprehensive, current data, maps, articles, and country profiles about the environment and sustainable development.

The website, http://earthtrends.wri.org, can also be reached through the newly re-designed WRI website, http://www.wri.org/wri/.

Announcement of Opportunity
START Fellowship/Visiting Scientist Program

(START = Global Change System for Analysing, Research and Training)

This program is designed to increase the number of developing country scientists who serve as active partners in global change research in START regional networks and in the Core Projects of IGBP, WCRP and IHDP. Through this effort, these scientists will be able to contribute to related aspects of sustainable development for their respective countries and regions.

START Fellowships are offered at the dissertation and post-dissertation levels. The fellowships allow young scientists from Africa, Asia, and Oceania to work under senior mentors in leading laboratories or institutions in any part of the world, where research is conducted on relevant regional aspects of global change. START fellows are able to learn and use new techniques and approaches not prevalent in their own countries. Long-term collaboration between the individuals and institution involved is one important outcome of the programme. The duration of these fellowships is ordinarily one or two semesters.

A parallel activity, the START Visiting Scientist Awards, allows more senior scientists from developing countries the opportunity to undertake short-term visits to major international laboratories to become acquainted with recent advances in research. The intended outcome is the development of long-term programmatic linkages between the individuals and institutions involved. The duration of these awards is usually 1-2 months.

Both the fellowship and visiting scientist awards will provide economy roundtrip airfare and a modest subsistence allowance.

Nominations/Applications

The following information should be included in nominations/applications for the START Fellowship and Visiting Scientist Programmes:

1) A brief description (3-5 pages) of the expected outcomes and benefits of the proposed fellowship, linkages to the international global change programmes should be made explicit
2) Indication of willingness of host institution to receive fellow or visiting scientist;
3) Curriculum vitae of candidate, including relevant qualifications and experience; and
4) Proposed budget requirements (economy airfare and stipend as appropriate).

DEADLINE for the tenth round of awards is: October 31, 2001

For further information, contact:
Ms. Amy Freise, Program Coordinator
International START Secretariat
2000 Florida Avenue, NW, Suite 200
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Tel: (1-202) 462-2213; Fax: (1-202) 457-5859
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The START Fellowship/Visiting Scientist Award Program is made possible through funds from The Netherlands Ministry of Foreign Affairs. We thank them for their continued support of START programmes.

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Committee on Interdisciplinary Cooperation (CIC), to liaise with international organizations and to promote joint programmes.
Chairperson: Dr. John M. Kimble, USDA-NRCS-NSSC, Federal Bldg. Room 152, 100 Centennial Mall North, Lincoln, NE 68508-3866, USA; <john.kimble@nsc.nrcs.usda.gov>.
Members: Dr. I.P. Abrol (India), Dr. R.W. Arnold (USA), Prof.Dr. W.E.H. Blum (Austria), Prof.Dr. A.M. Elgala (Egypt), Dr. A. Gennadiev (Russia), Dr. D.J. Greenland (UK), Prof.Dr. K. Kyuma (Japan), Dr. H.U. Neue (Philippines), Prof.Dr. P.A. Sanchez (USA), Prof.Dr. H.W. Scharpenseel (Germany), Dr. W.G. Sombroek (The Netherlands), Prof. J.W.B. Stewart (Canada), Prof.Dr. P.B. Tinker (UK), Dr. G. Vachaud (France), Prof.Dr. G. Varallyay (Hungary), Prof.Dr. D.H. Yaalon (Israel).

Committee on Standardization (CST), to liaise with the International Standardization Organization (ISO, Geneve-Switzerland) and its Technical Committee on Soil Quality (ISO/TC 190, NNI, Delft, The Netherlands).
Chairperson: Dr. Stephen Nortcliff, Dptmt. of Soil Science, PO Box 233, Whiteknights, The University of Reading, Reading, RG6 6DW, UK; <s.nortcliff@reading.ac.uk>.
Members: vacancy (Comm.I), Prof. A.L. Page(USA, Comm.II), vacancy (Comm.III), Prof. K. Syers (Thailand, Comm.IV), vacancy (Comm. V), Y.P. Kalra (Canada, Comm.VI), vacancy (Comm.VII), vacancy (Comm. VIII), Prof. Somsri Arunin (Thailand, Subcomm.A), Dr. W. McDonald (Australia, Subcomm.B), Prof. R. Lal (USA, Subcomm.C), Prof. L. Brussard (Netherlands, Subcomm.D), Dr. K.-J. Meiwes (Germany, Subcomm E), Dr. A. Mtimet (Tunisia, Subcomm. F), vacancy (Subcomm. G).

Committee on Budget and Finances (CBF), instead of ad-hoc committees at Congresses.
Chairperson: Dr. W.R. Gardner, College of Natural Resources, Univ. of California, Berkeley, CA 94720, USA; <wgardner@cc.usu.edu>.
Members: Prof.Dr. W.E.H. Blum (Austria), Dr. D. Gabriels (Belgium),Dr. P.U. Luescher (Switzerland), Dr. W.G. Sombroek (The Netherlands) and one representative of the regional Society of Africa, East/Southeast Asia and Latin America.

Committee on Education in Soil Science (CES), with particular attention to secondary school/college level
Chairperson: Prof.Dr. M. Dosso, CNEARC, B.P. 5089, 1101 Av. Agropolis, 34033 Montpellier, France; <dosso@cnearc.fr>.
Members: Rabah Lahmar (Algeria), Pamela Hazelton (Australia), Stephen Nortcliff (Great Britain), John Hatzopoulos (Greece), Mamadou Khouma (Senegal), Angélique Lansu (The Netherlands), Bruce James (USA).

Committee on History, Philosophy and Sociology of Soil Science (CHP)
Chairperson: Prof.Dr. Dan H. Yaalon, Inst. of Earth Sciences, The Hebrew University, Jerusalem 91 904, Israel; Fax: +972-2-566-2581; <yaalon@vms.huji.ac.il>.
Members: to be defined

IUSS Representatives in Committees/Commissions of International Organizations:

ICSU-SCOPE	Scientific Committee on Problems of the Environment: Dr. F. Fournier (France).
ICSU-CSFS:	Scientific Committee on Sciences for Food Security: Prof.Dr. W.E.H. Blum. (Austria).
ICSU-IBN	International Biosciences Networks: Prof.Dr. P.A. Sanchez (USA).
ICSU-IGBP	International Geosphere-Biosphere Programme: Dr. J. Kimble (USA)
ICSU-COSPAR	Committee on Space Research: Dr. Karale (India).
ICSU-CODATA	Committee on Data for Science and Technology: Prof.Dr. M.F. Baumgardner (U.S.A.).
IUBS-UNESCO-TSBF	Dr. J. Kimble, USA

ACTIVITIES OF COMMITTEES, COMMISSIONS, SUB-COMMISSIONS, AND WORKING GROUPS

Committee on Education in Soil Science (CES)

At the last meeting of the CES (Osnabrück, Germany, September 2000), it was decided to begin an inventory of the WWW sites dealing with soil education. A first survey was made by Dr Albert Bos with the collaboration of Prof Dr Alain Ruellan. This first list contains about 70 sites. If you are interested to receive this list (by email) and, if possible, to contribute to this list, please send an email message to Professor Ruellan : "ruellan@agropolis.fr".

He will send you the list and we hope that you will contribute by completing it. Thank you

Prof Dr Mireille Dosso, Chairperson of the CES

WORKING GROUP REMOTE SENSING (RS) FOR SOIL SURVEY

The Working groups RS and DM (World Soils and Terrain Digital Data base) continued cooperation in the form of organizing a symposium on the application of RS and GIS in mountainous land. The event was sponsored by the: International Association of Geomorphologists (IAG), International Institute of Aerospace Survey and Earth Sciences (ITC), International Union of Soil Sciences (IUSS), International Centre for Integrated Mountain Development (ICIMOD), Wageningen University and Research Centre (WUR) and European Commission (Space Applications Institute and European Soil Bureau).
Kathmandu (Nepal) was selected as symposium site in the period 22-29 August 1999.
The symposium was well attended with 40 participants from 15 countries in Asia, America and Europe.
It was with pleasure that we enjoyed the hospitallity of the Nepalese people. The excursion was well organized despite the heavy rainfall.
The editorial board of the symposium aims at publication of most of the papers in an international journal, which causes delay in publishing the proceedings but makes the products more valuable. We hope to see the results very soon!
So far the report about activities. Another reason to address you is the retirement of the present chairman of the WG RS. Dr. Richard Escadafal, now acting as vice-chairman, will become the new chairman.
He will be active in organizing an international symposium in Marrakech (Kingdom of Morocco12-15 November 2001; Arid Regions Monitored by Satellites — from Observing to Modelling for Sustainable Management) and will act as convenor of symposium 52 (Remote Sensing for data fusion and GIS *as tools in land evaulation and degradation studies) of the* 17th *WCSS in Thailand (14-21 August* 2002).
I wish my successor a nice and scientifically fruitful time as chairman of the WG RS.
I enjoyed the work as chairman very much and thank the vice-chairman and Dr.Dhruba P. Shrestha, secretary of the WG RS, and all others, who supported our work, for their cooperation in the period 1993-2001.

Michel Mulders, The Netherlands

XIII International Colloquium on Soil Zoology, 14-18 August 2000, Ceske Budejovice, Czech Republic

Thirteen was this time a lucky number for the long-time series of soil zoological conferences. Nearly three hundred participants from 40 countries (with a fair representation from eastern and western Europe, but also quite some participants from North and South America, Asia and Africa) attended this conference which was well organised by Josef Rusek and his team. The conference was held in a warm and friendly atmosphere.

But also from a scientific perspective the conference was a great success. It combined not only soil zoology and soil microbiology with soil pedology and soil science in general, but it also provided a window to general ecology. Especially this last perspective, as masterly sketched in various introductory papers, was greatly appreciated by the participants.

It is therefore not surprising that "The Bureau", the Executive Committee of Sub-Commission D "Soil Zoology" very seriously and intensively discussed the new organisation of the IUSS in which there should be no room any more for this series of soil zoological conferences. A strong signal to maintain the status, supported by all participants at the closing session will be sent to the Officers of IUSS.

In the opening lecture H. Eijsackers broke a lance for a more thematic approach in soil ecology with five guiding themes: Spatial plus temporal heterogeneity, dispersal ecology (from mobility to biogeography), structural plus functional biodiversity, nutrient cycling and energy transfer, adaptation (at bacteria as well as ecosystem level) to combine not just soil zoology and pedology, but moreover to integrate the various levels of biological organization (from sub-organismal to ecotope level).

The scientific programme further comprised five sessions:

1. Biodiversity and its function in soil (with an introduction by V. Wolters);
2. Contribution of soil zoology to integrated ecosystem studies (introduced by R. de Goede, with a fascinating example from the Negev desert);
3. Trophic relationships and food webs (with an introduction by S. Scheu about the merits of working with stable isotopes);
4. Disturbances and resilience of soil organism communities (with an introduction by J. Bengtsson about a more dynamic approach of ecosystem formation c.q. switch to an other ecosystem)
5. Effects of environmental changes on soil organisms (for which A. Reinecke sketched how broad the framework for this topic has to be).

In the closing session, Prof. A.J. Reinecke and Dr. G.H. Baker were introduced as the new chairman and secretary of the Executive Committee of this Commission, with D. Wall and P. Lavelle as other members. S. Scheu and L. Brussaard became new members of the Sub-Commission, while J. Anderson, H. Eijsackers and J. Kühle retreated. The Commission, moreover, gets a more advisory role.
The next International Colloquium on Soil Zoology will be held in Rouen (France) in 2004.

H. Eijsackers

First International Conference on
Soils of Urban, Industrial, Traffic and Mining Areas

In 1998 at Montpellier during the 16th World Congress of Soil Science the Working Group Soils of Urban, Industrial, Traffic and Mining Areas (SU/SUITMA) of the International Union of Soil Science was established. The working group SU/SUITMA- is linked to Commission V (Soil Genesis, Classification and Cartography) and VIII (Soils and the Environment). The first Conference of the Working Group SU was held in Essen, Germany, from July 12 to 18, 2000 in co-operation DBG-Deutsche Bodenkundliche Gesellschaft/German Soil Science Society.

The SUITMA-Conference comprised in 3 days oral and poster presentations, Small Group Discussions on the objectives of the conference themes, Research Partner Mediation Event and in addition 5 one day excursions. The number of contributions was 214. Among them have been 19 from German Cities.

The Conference was visited by 161 colleagues, 64 from Germany included. They came from 37 countries. It was a great pleasure, that they did find the way from all Europe and particular from Eastern Europe to Essen. A great advantage for the SUITMA-Conference was the participation of colleagues from Africa, Asia, Australia, South and North America. It was a strong demonstration of the necessity that soil science has to go into cities all over the world. According to this the motto of the conference was 'the CITY has SOILS/ die STADT hat BOEDEN – the CITY needs SOILS/die STADT braucht BOEDEN'.

There is already a strong interest of the German Federal Government, the Government of the State North-Rhine Westphalia and particularly of the city planning offices in urban soils. Dr. Woiwode did give an introduction about this by illuminating the new German Soil Protection law from 1998. Secretary of State Mrs. Friedrich showed the successful implementation of urban soil research in the activities of the state North-Rhine Westphalia and Dr. Wiese von Ofen of the International Federation for

Participants of excursion 'Urban Soil Use' in the mine worker village Gelsenkirchen-Schüngelberg to see Hortisols and storm water infiltration ditches

Housing and Planning did give an introduction of the ideas of city planning related to soils. Prof. Blum of IUSS presented the challenges for soil science which are waiting in urban areas and must be coped. There were three major themes of the conference. A – the Unknown Urban Soil – Detection, Resources and Face. The contributions to this were already numerous. They concerned field and laboratory methods, historical urban soils, field survey and soil maps, classification of urban soils, man-made substrates.

Definite lower was the number of contributions to B – Application of Soil Information. Obviously until now this field of work was only exemplary discovered by soil scientists. On the conference treated were sludge and waste, storm water infiltration, vegetable gardens, green areas, playing grounds and city planning.

The third main focus C – Soil Quality and Problems had a very good resonance. The great number of contributions did deal with soil quality, soil degradation, soil protection, soils of biotops/pedotops, soil remediation, specific problems of industrial, traffic and mining areas.

Two of the 22 sub-themes in total did lack contrbutions: the key theme City management and soils (A) and Burial ground (B). For us soil scientists it means that we have to encourage research about these very important themes.

The contributions showed the large field of research which is waiting for soil science in urban areas. In part it could be pointed out only roughly, in part already extended studies were presented.

The conference had also the aim to show urban soils and to discuss their features and problems in the *field. The large old industrial area of the Ruhr with its heavy and chemical industry and hard coal* mining areas is very qualified for that purpose. This very important part was realized by 5 excursions, A – Modified soils (by stratification, mixing, compaction, contamination, humus accumulation, fine earth reduction by skeleton content, ground water lowering), B – Soils from man-made substrates (ruble, waste, sludge, ash, slag, thermal cleaned soil), C – Urban soil use (park forest, vegetable garden, play ground, storm water infiltration, biotop), D – Extreme contaminated soils, soils as sources of fine dust (PM10), E – Soils from hard coal mining and soil reclamation. Totally 25 soil profiles had been presented and discussed. 9 additional sites had been visited.

Participants in front of the hard coal mining spoil heap Schurenbachhalde, an example of soil landscape designed by artists.

One of the important resumes of the conference was the appeal to strengthen and organize the field of urban, industrial, traffic and mining soil science world wide by the establishment of national and regional SUITMA working groups under the roof of soil science societies. Further on cities and companies of industry, traffic and mining should play an active role in the development of urban soil science. For more information see from time to time <http://www.suitma.de>.

The success of the First SUITMA Conference was the result of cooperation with many colleagues all over the world who managed the scientific sessions and of the members of the Working Group Urban Soils of the German Soils Science Society who managed the small discussion groups, and all the coworkers of the Departement of Soil Technology of the University Essen. The Conference was supported by the University of Essen, the Deutsche Forschungsgemeinschaft (German Science Foundation), Sponsoring Association for the City of Essen, State of Nothrhine Westfalia, City of Essen, Umweltschutz Nord.

The next meeting of the working group SU/SUITMA will be on the 17th Congress of Soil Science in Bankog, from August 14 – 21. It will arrange Symposia No.55: Improving knowledge about soils and their functions in urban, industrial and mining areas for a better life.

For 2003 the Second SUITMA Conference is planned in Nancy, France, organized by Prof. Dr. Morell, Co-convener of WG SUITMA, ENSAIA.

The Proceedings of the SUITMA Conference were published in 3 Volumes of 1098 pages. They can be ordered from Prof. Dr. W. Burghardt, Fb.9, Soil Technology, Universität Essen, 45117 Essen, Germany, *Fax. +49 201 183 2390, e-mail: wolfgang..burghardt@uni-essen.de.*

Price 45 US$ plus postage.

Wolfgang Burghardt
(Convener of IUSS Working Group SU/SUITMA)

World Reference Base for Soil Resources (WRB) - The identification key as computer programme

The release of the computer programme WRBSOIL is based on HTML language and therefore runs platform-independent on PC as well as on MAC. The programme has been developed by Dr. Friedrich Bailly from Germany.

The programme covers the soil identification key of WRB, leading step-by-step through the whole range of all 30 Reference Soil Groups. One must stop at the first Soil Group that includes the soil with which one is concerned. Hyperlink connections inform on Diagnostic Horizons, Properties and Soil Materials. Subsequently one must check all Subunit Qualifiers according to their respective priority, to decide on lower level subunits. Hyperlink navigation has been restricted throughout to a maximum two levels, in order not to "get lost in hyperspace".

The identification key might help to boost the use of WRB as well as support classroom teaching in soil classification. The programme may be used on a laptop when working in the field as well as on a computer for deskwork. The programme is available as demo version and as full version via the following address: http://home.t-online.de/home/f.bailly.

World Reference Base for Soils (WRB) Correlation Tour in Georgia, 20 July to 1 August 2000

1. Introduction

Some 12 people from six countries went on the complete tour **(see list of participants in Annex 1)**. Apart from the organizer, Professor T. Urushadze, only one other Georgian accompanied the whole tour though several others joined it for local site examinations and there was a good turnout for the dis-

cussions on 29 July at the Agricultural University in Tbilisi. The tour covered about 1300 km and most of the main zones of the country.

2. Soils Examined

The main soils examined in detail are listed in **Annex 2**, though a number of others were looked at in road cuttings. Analyses were provided but as they were quite old and did not refer to the actual sites examined their value was limited and in some cases it was clear that the profile examined was quite different from the representative analysis provided. Some analyses were questionable, particularly the determination of clay content in some soils and the content of calcium carbonate and calcium sulphate. The profiles examined were in general well selected representatives of the soils they were supposed to typify (although some were sited near to roads or other disturbed places). They therefore provided a fair test for the WRB.

3. Problems and suggestions for WRB

Various problems and opportunities for improvement were noted in the course of the tours **(see also Annex 3)** and were discussed by the group on 29 July. The main items and proposals for change were as follows; some of the main points of the discussions are reported here.

3.1. Cambic B

The classical Cambic is chemical. For clay migration to occur the right conditions must exist. In UK for instance the right conditions are rare so there are many Cambisols. Some Cambic horizons differ from the C horizon only in structure. Structure can form quickly whereas chemical change may take thousands of years. To split the two kinds of Cambic it was suggested to call the structural one Primic. Not everyone agreed with Professor Blume about this as there would be a possible danger of a proliferation of different kinds of Cambic.

3.2. Mollic

The Mollic horizon should not be hard-setting and this should be rigidly applied. The Russians and Americans to comment, since they have many Mollic soils.

3.3. Mollic in Cambisols

The qualifier Humic should be added to the list of qualifiers, according to our on-site discussion.

3.4. Argic in saprolite

Saprolite defined as <10% fine earth with rock structure (if any). But a note is needed to insist that saprolite weathering is soil formation and should be studied, not ignored.

3.5. Stagnic and Gleyic properties

Professor Blume has given on-site clear and concise explanations of the differences between Gleyic and Stagnic conditions, how to recognize them in the field and of the possible occurrence of Stagnic properties in Gleysols. It was proposed that he should put them in writing in order to make the WRB clearer.

3.6. Terra Rossa

The term is being abandoned in Italy. There are at least two different colluviums from hard limestones.

1) Parent material for many soils which are Chromic Cambisols and Luvisols
2) Material in karst hollows are Nitisols –v. high clay up to 90%.
3) Terra fusca- high clay content 45%, v. stable structure because of high Fe2O3 content. In cooler climates.

Clay content and clay-iron ratio should be specified. There is also need of a Rhodic Luvisols to cover these soils.

3.7. Pellic in Vertisols (and Chromic)

Pellic was originally intended to indicate the wetter Vertisols, but colour is not a good criterion of this. The qualifier is useful even without the wetter implication. Perhaps we should check again to see if it is worth having a Stagnic Vertisol (see also the comments by R. Schargel, January 2000, on the proposed revision of the key to WRB of September 1999 and on the WRB publication 1998).

3.8. Priority of qualifiers

This was studied in Vietnam, Sicily, and again was raised in Georgia. There are two schools of thought (see also "Some thoughts" by Dave D'haeze in **Annex 4**):

a) Mainly teachers who prefer a more structured approach. Three groups of qualifiers:

a) Unique to reference group (e.g. Geric, Rhodic, Gypsic, etc)

b) Intergrades between groups

c) Extragrades (hyper etc).

Each would have to be prioritized. Structure is necessary to ensure that everyone using the system will arrive at the same classification for any soil. Everything else is structured so this should be too.

b) The practical field workers and mappers. The qualifiers are just bricks and the order of laying them does not matter. People want the system to be flexible. This is necessary for international correlation, and in mapping and other investigations for specific development purposes flexibility is needed to make the most useful legend.

It was also suggested that the Fitzpatrick approach and nomenclature might be usefully examined in this context. Frank Berding was not present at this discussion as he had to leave to catch his plane, but he had already provided a good account last March. Would it be possible to achieve a structured and also flexible system?

3.9. Paraleptic Leptosols

Suggested addition for soils on soft not hard rocks which are sterile even though penetrable by roots. To take such soils out of Regosols.

3.10. Humic Gypsisol

This is needed for special situations (such as we saw in the former vineyard now used as a rubbish dump and gypsum mining site near Tbilisi). Fully lithogenic gypsum soils should be excluded; if the climate is very humid gypsum does not move within the soil – it is washed out. Only lithic gypsum.

3.11. WRB should permit instant classification of typical soils

M. Purnell raised this issue because he was surprised that after so many years it still seems difficult to recognize and (instantly) classify familiar soils. As mentioned above, the soils we saw were mostly typical examples which have been seen many times before by most of the participants and by WRB groups. One would expect therefore that the soils would be familiar and could be immediately classified at least into one of the 30 main groups. Botanists or foresters do not hesitate to give a name when they see a familiar tree. After that of course there may need to be more discussion for a more detailed classification. Admittedly in the Georgia case some hesitation was caused by misleading analyses. Nevertheless, if the WRB is to fulfil its major function of encouraging non-soil scientists to use this technical nomenclature for soils, instead of vague terms like red, sandy, meadow, laterite, etc, the main groups at least should be clearly recognizable by everybody familiar with the kind of soil. It seems counter productive for WRB groups to spend a long time identifying soils which should be immediately recognizable rather than providing a name and then going on, for educational purposes, to discuss the main characteristics.

The classification needs to be quick on-site in order to be useful for agriculture and to make quantitative classification more straightforward. There are hundreds of possible parameters for soils but we

must manage with only a few and none of them apply to all soils. Horizon groups might be prioritized. The issue needs to be considered further.

4. The Soil Map of Georgia

The 1:500,000 Soil Map of Georgia is almost ready for printing and is required by the government. Professor T. Urushadze is keen to include the WRB classifications on the map as well as the Georgian names and their translation into English (with nomenclature based on the Soviet Union classification). Therefore on 31 July a small group (Urushadze, Blume, Bronger, Poetsch, Purnell) went through the legend of the map and suggested equivalents in the WRB. This will permit the prompt publication of the map.

However the units shown on the map although they have only one soil unit name are in fact associations or soil regions. It is not good cartographic practice to indicate a single soil name for a mapping unit which contains a variety of soils. It was therefore suggested to Professor Urushadze that the Legend should make it clear that the name refers only to the dominant soil , and that as soon as possible an expanded legend should be produced giving the main associated soils and inclusions (as was done for the Soil Map of the World). Such an expanded legend need only be a few pages long, even of typescript. It appears to be well within the capabilities of Georgian soil scientists who seem to have a good knowledge of the various soils in different regions. It would, incidentally, add some additional soil units to the map – for example Cryosols, which must exist though they are not mentioned. It would also avoid giving a false impression of uniformity to non soil scientists who use the map.

5. Conclusion

The tour was a success in enabling a number of soil scientists to familiarize themselves with some of the main soils of Georgia in their geomorphological and climatic settings, and in demonstrating that the WRB works without major difficulties and provides a sound base on which to build a soil database for Georgia.

Future WRB meetings, in W. Africa (Nov. 2000), Hungary (Aug-Sept. 2001), and California (October 2001 – Soil Taxonomy), should be able to benefit from and confirm the above proposals).

ANNEX 1: List of partcipants

Berding Frank, Netherlands (FAO, Tunis)
Blume Hans-Peter, Kiel, Germany
Bronger Arndt, Kiel, Germany
Castellani Federico, Siena, Italy
Deckers Joseph, Leuven, Belgium
D'haeze Dave, Leuven, Belgium
Lezhava Irakli, Tbilisi, Georgia (26 and 27 July)
Malucelli Francesco, Italy
Muccio Marcella, Italy
Napoli Rosario, Italy
Narimanidze Eliso, Tbilisi, Georgia
Poetsch Thomas, Hamburg, Germany
Purnell Maurice, United Kingdom
Sarnataro Maria, Italy
Urushadze Tengiz, Tbilisi, Georgia

M.F. Purnell, August 2000,
with contributions from H.P. Blume, D. D'haeze and F. Berding

REPORTS OF MEETINGS

XXX MEXICAN CONGRESS OF SOIL SCIENCE

***Sociedad Mexicana de la Ciencia del Suelo*;**
Veracruz 25-29 September, (Mexico 2000)

From September 25 to 29, 2000, the XXX National Congress of Soil Science of the *Sociedad Mexicana de la Ciencia del Suelo* was held in Veracruz (Mexico). The fact that this was already the 30th congress shows the long tradition that soil science has in Mexico.

More than 500 scientists attended the Congress, and approximately 250 oral or poster presentations were given.

The Congress was divided into four Symposia: a) Conservation tillage (coordinated by Joel PEREZ); b) Acid-soil management (organized by Dr. Jorge ETCHEVERS); c) Educational innovations in the teaching of soil science (coordinated by Prof. Laura B. REYES; and d) Sugar-cane production (coordinated by Drs. David PALMA and Osvaldo ASCANIO). The invited foreign scientists, who gave keynote lectures, were: Dres. Osvaldo ASCANIO and Alberto HERNANDEZ (Cuba; "Degradation of sugar-cane soils through intense burning, in the State of Veracruz "); Dr. Juan F. GALLARDO (Spain; "The role of humic substances in ecosystems and environmental protection"); and Dr. José TORRENT (Spain; "Methods of identification and characterization of iron oxides in acid soils: State of the art and perspective"); Dr. Rafael VILLEGAS (Cuba, Symposium on "Production of sugar-cane") spoke on the "Problems of the fertilization of sugar cane", and Dr. Malcolm SUMNER (USA, Symposium on "Management of acid soils") spoke on "Use of gypsum on acid soils".

The Symposium on the teaching of soil science was attended by children from primary and secondary schools (which is a new aspect in this type of congress), the Drs. GALLARDO, REYES, and VILLEGAS also participated in this Symposium. The children and the invited scientists (including Dr. TORRENT) were named "distinguished visitors" of the City of Veracruz.

A field excursion had also been scheduled and three different soils (affected by volcanic ashes, and one of them also by sea alcalinity) were visited and discussed (Drs. GALLARDO and TORRENT were coordinators), showing different degrees of evolution; a great number of soil science students and local technical experts participated in this excursion.

The Congress was very well organized by the President of the S.M.C.S., Dr. Víctor M. ORDAZ, the General Secretary, Prometeo SANCHEZ, and the rest of the staff of the Society, who received congratulations from the attendants. The hotel was located in marvellous surroundings, opposite the harbour of Veracruz. The soil scientists had ample opportunity to enjoy the the historical centre of Veracruz, lots of Caribbean live music and beautiful sunsets.

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X COLOMBIAN CONGRESS OF SOIL SCIENCE

Sociedad Colombiana de la Ciencia del Suelo
Medellín 11-15 October (Colombia 2000).

From October 11 to15, 2000, the X National Congress of Soil Science of the *Sociedad Colombiana de la Ciencia del Suelo* was held in Medellin (Colombia). The large number of participants in this 10th congress confirms the strong interest for soil science that exists in Colombia, considering the problems in organizing this Conference in the difficult situation the country is facing at the moment. The subject of the Congress was "Soil and the environment".

More than 500 persons attended the congress, almost 40 % of them university students, approximately 160 oral or poster presentations were given, divided into four Commissions: I. Soil fertility; II. Mineralogy and chemistry of soils; III. Soil physics, management, classification, and irrigation; and IV. Soil biology.

In addition, two symposia were organized: "Soil organic matter: Myth or reality?" and "Use of microorganisms in agriculture", within which invited lectures were presented.

The invited foreign scientists who attended the conference were Dr. Juan F. GALLARDO, who gave the keynote lecture "Soil and the water cycle" (and, in addition, "Mineralization of soil organic matter and environmental contamination" in the first Symposium); and Dr. Rafael VILLEGAS, who spoke on "The mono-culture of the sugar cane" and "Bio-fertilizers". The Presidents of the Argentinian Association of Soil Science (Gustavo MOSCATELLI) and of the Ecuatorian Society of Soil Science (José ESPINOSA) also attended the Congress. Finally there was a Round Table on the topic "Education in Soil Science" with the participation of Edgard AMEZQUITA, Juan F. GALLARDO, Alvaro GARCIA, Michel MELIN, Gustavo MOSCATELLI and Raúl ZAPATA.

During the closing banquet, prizes were awarded to several Colombian scientists for their outstanding achievements in the study of Colombian soils: Drs. F. SILVA, A. GARCIA, R. GUERRERO, R. ZAPATA, H. BURBANO, and D. MALAGON, among others.

The excellent organization of the congress was coordinated by Ing. Jesús RENGIFO, and the President of the S.C.C.S., Dr. Raúl ZAPATA, who made sure that all the participants got the maximum out of this congress in the comfortable surroundings of the Hotel Intercontinental. There was a number of very interesting commercial posters and stalls, and excellent Colombian coffee was offered freely all the time.

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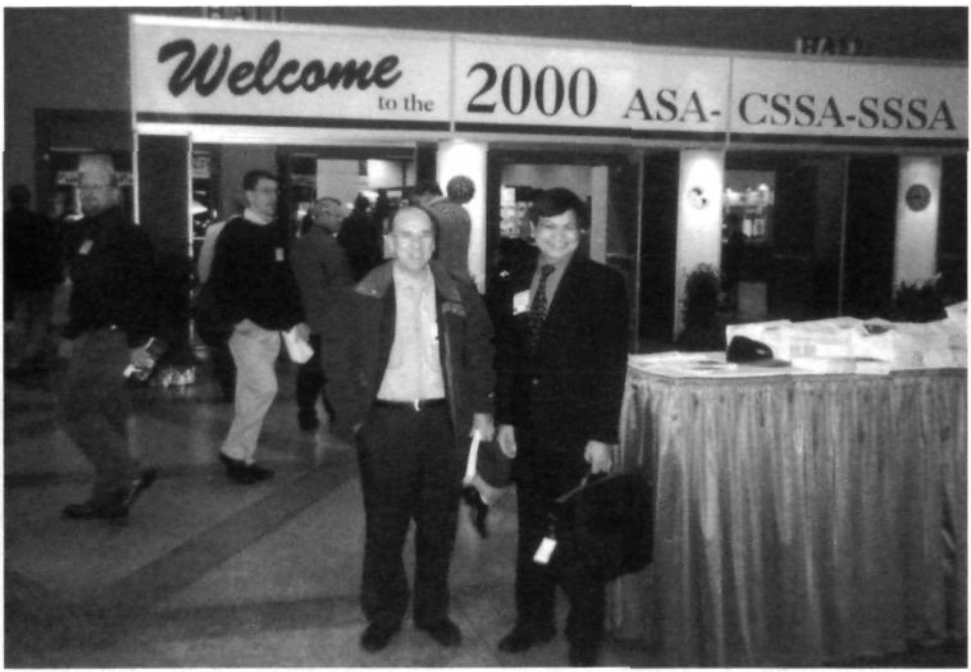
ANNUAL MEETING OF THE AMERICAN SOCIETY OF AGRONOMY

The 92nd Annual Meeting of the American Society of Agronomy (ASA), the 45th Annual Meeting of the Crop Science Society of America (CSSA), and the 64th Annual Meeting of the Soil Science Society of America (SSSA) were held in Minneapolis, MN, November 5-9, 2000. The National Society of Consulting Soil Scientists, a chapter of SSSA, also met on November 4-5, in conjunction with the ASA meetings.

The majority of the activities were held at the Minneapolis Convention Center which is a part of a world-famous skywalk system (five miles of climate-controlled walkways that link hotels, restaurants, shopping venues, and other attractions). Minneapolis (nickname "City of Lakes") is a combination of "minne", a Dakota word for water, with "polis", Greek for city. Just minutes away from downtown is the Mall of America - USA's largest enclosed shopping and entertainment complex.



The majority of the activities were held at the Minneapolis Convention Center.

The theme of the meetings was "*Agronomy, Crop, and Soil Sciences: Stars of the 20th Century - Beacons for the 21st*". The program not only focused on current findings but also highlighted the discoveries and developments of the 20th century which under-gird our disciplines and sciences. More than 2,800 papers were presented; workshops and tours were offered. There were a series of food functions and receptions, e.g., Soil Testing and Plant Analysis Breakfast, Cornell Thirsty Bear Reception, Michigan State University Spartan Reception, and South Dakota Jackrabbit Stampede. In addition, there were several board, committee, and other meetings, e.g., Soil and Plant Analysis Council, Soil Testing and Plant Analysis Committee (S877), Coordination of Official Methods of Soil Analysis Committee (S889), North American Proficiency Testing Program Oversight Committee (S890), Association of Agricultural Scientists of Indian Origin, Association of Women in Soil Science, Iranian Society of Agricultural and Life Science Professionals in North America, USDA-ARS Scientists, and other

groups. The Career Development and Placement Service was available to assist applicants with employment and assistantship interviews, and to help employers advertize position openings, review resumes, and interview potential employees and graduate students while at the conference. The exhibits and combined publishers displays were informative. A very enjoyable meeting indeed !

This is the last year that the *Annual Meetings Abstracts* were produced as a print publication. Next year the tri-societies will debut *Annual Meeting Abstracts* entirely on the Internet.

Darrell W. Nelson, David A. Sleper, and Robert J. Luxmore assumed 2000-2001 presidencies of ASA, CSSA, and SSSA, respectively. Vernon B. Cardwell, Ronald L. Phillips, and Donald L. Sparks completed their 1999-2000 terms as Presidents. The tri-societies' officers, organizers, and headquarters staff are to be congratulated for excellent conference in the Twin Cities. The next two meetings are scheduled for Charlotte, NC (October 21-25, 2001) and Indianapolis, IN (November 11-14, 2002). Further information is available from the American Society of Agronomy, 677 S. Segoe Rd., Madison, WI 53711, USA, phone (608) 273-8080, fax (608) 273-2021. To access this information on the World Wide Web, point your browser to http://www.agronomy.org, http://www.crops.org, and http://www.soils.org.

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Eighth International Congress of Soil Science, Islamabad, Pakistan

The 8th International Congress of Soil Science, organized by the Soil Science Society of Pakistan (SSSP), at the National Agricultural Research Center (NARC), Islamabad, November 13-15, 2000, attracted about 300 delegates from across Pakistan and other countries. Although I have been a life member of SSSP for a few years, this is the first conference that I got the opportunity to attend. I was the sole delegate from the North American continent at this biennial event. The theme was "Soil for food security". To encourage participation, SSSP provided travel grants to some students presenting papers as senior authors. The abstracts of the papers were available at the time of registration.

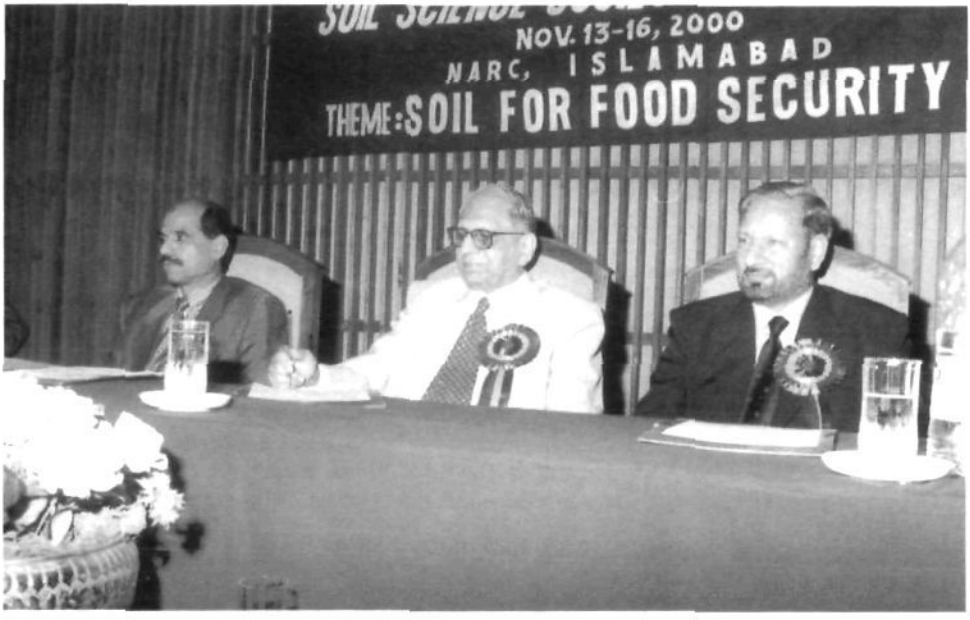
The conference opened with a welcome from SSSP President Dr. Riaz H. Qureshi, Vice Chancellor, University of Agriculture, Faisalabad. The chief guest at the inaugural session was Mr. Omar Asghar Khan, Minister for Environment, Local Government and Rural Development. The keynote plenary speakers were from Canada, India, Japan, and Pakistan. A total of 125 voluntary papers (110 of them from Pakistan), including 24 as posters, were presented in these sections: Agronomy, soil chemistry, soil conservation, soil environment, soil fertility/plant nutrition, soil microbiology, soil physics, and soil salinity. The papers presented will be published in the Pakistan Journal of Soil Science after the regular review process.

The concluding session on November 15 included thought-provoking comments by the SSSP President, prize distribution for the posters, business and general body meeting, reports of the treasurer and the general secretary, presentation of recommendations, and an inspiring address by the chief guest Ch. Shafi Niaz, Advisor to the Chief Executive General Pervez Musharraf on Food and Agriculture.

I am grateful to several friends at NARC for their assistance: Dr. Iftikhar Ahmed, Dr. M. Ehsan Akhtar, Dr. Abdul Rashid, Dr. Tahir Rashid, Mr. Khurram Bashir, Mr. Younis Arain, Mr. Ijaz Hussain, Mr. Adam Khan, and Mr. M. Munir.

After participating in the conference, I visited the Soil and Water Conservation Research Institute in Chakwal and the University of Agriculture and the Ayub Agricultural Research Institute (AARI) in

Ch. Shafi Niaz (right), Advisor to the Chief Executive General Pervez Musharraf on Food and Agriculture, welcoming Yash P. Kalra, an Indo- Canadian soil scientist, to Pakistan.



(left to right) Dr. M. Ehsan Akhtar (SSSP General Secretary), Ch. Shafi Niaz (Chief Guest), and Dr. Riaz H. Qureshi (SSSP President) at the concluding session.

Faisalabad. At Chakwal, I had discussions with Dr. Muhammad Rashid and other scientists on the recent advances in soil analysis. Thanks are due to Dr. Riaz H. Qureshi, Dr. Tahir Hussain, Dr. Maqsood Ahmad Gill, Dr. Javaid Akhtar, Mr. Munir Hussain Zia, Mr. Iftikhar Ahmed, and Mr. Saeed Eqbal for being gracious hosts at the University of Agriculture. Dr. Muhammad Ibrahim, Mr. Muhammad Ishaq, and Mr. Sher Khan were very helpful to me at AARI where I presented a seminar.

A trip to Pakistan enabled me to visit Nankana Sahib and Panja Sahib, two of the holiest Sikh places in the world and Taxila (Takshasila), one of south Asia's richest archaeological sites. I also visited Gunjial (my birthplace), Shadia (my mother's birthplace), Harnoli (my father's birthplace) and Van Bhachran (the birthplace of my two brothers) where I lived more than half a century ago. It was a real joy to talk to the people in the Mianwali Punjabi dialect that I learnt when I was a little boy. It certainly was a trip down the memory lane. This is the stuff that the memories are made of ! My brother Shri Satya P. Kalra and Mr. Ijaz Chaudhry showed me the historic city of Lahore like no tour guide could have done. And I am grateful to Mr. Mohammad Tufail Hussain, Dr. Munawar H. Chaudhry, Dr. Akhtar Hussain, Parveen Bhabhi, Aeysha, and Ali for their great hospitality. I am thankful specially to Dr. Zafar Altaf, Federal Secretary MINFAL and SSSP President Dr. Riaz H. Qureshi for giving me the opportunity to visit Pakistan. My brother also thanks all those who, by their kind assistance, made his visit to Pakistan a very memorable one.

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65th Annual Convention of the Indian Society of Soil Science

The 65th Annual Convention of the Indian Society of Soil Science (ISSS) was held at the National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Nagpur during December 27-30, 2000. A brief report on the Convention is presented hereunder.

Inaugural Session

The inaugural session was held on 27th December 2000. Dr. M. Velayutham, President extended a warm welcome to the Chief Guest Dr. J.S. Kanwar, Honorary Member of IUSS and Dr. P. Rengasamy of CRC Soil and Land Management, Glen Osmond, Australia and Chairman of Commission VI of IUSS, many distinguished guests, and the 450 delegates present in the session.

Chief Guest Dr. J.S. Kanwar presented the various Honours, Fellowships and Awards of ISSS for 2000 and Dr. G. Narayanasamy, Honorary Secretary read the citations. The Fellowship of ISSS was conferred on Dr. Bijay Singh, Senior Soil Chemist, Punjab Agricultural University, Ludhiana; Dr. R.K. Rattan, Senior Scientist, Indian Agricultural Research Institute, New Delhi; Dr. J.S. Samra, Deputy Director General (NRM), Indian Council of Agricultural Research, New Delhi and Dr. M.S. Aulakh, Senior Soil Chemist, Punjab Agricultural University, Ludhiana. Dr. D.L.N. Rao, Project Coordinator, AICRP on Biological Nitrogen Fixation, Indian Institute of Soil Science, Bhopal received the the 12th International Congress Commemoration Award. Dr. Vinod Kumar Phogat, Assistant Scientist, CCS Haryana Agricultural University, Hisar was awarded the ISSS Golden Jubilee Young Scientist Award.

Dr Kanwar presented his address on the topic "Perspectives and policies for land use planning".

Special Lectures

The 18th Professor J.N. Mukherjee - ISSS Foundation Lecture was delivered by Dr. N.K. Tomar on the topic "Dynamics of Phosphorus in Soils" on 27th December
2000. The 27th Dr. R.V. Tamhane Memorial Lecture was delivered by Dr. P. Rengasamy, on the topic `Subsoil Constraints and Agricultural Productivity' on
28th December 2000.

Special Symposium

A Special Symposium on "Perspectives and Policies for Land Use Planning" was arranged on 28th December 2000. Six lead articles covering the different agro-ecosystems of India were presented by invited speakers, with each one followed by discussion. A Panel Discussion was held subsequently on 29th December 2000. This was moderated by Dr D.R. Bhumbla, Former Agricultural Commissioner, Government of India.

A publication arising out of this exercise is proposed to be brought out in the near future.

National Seminar

A National Seminar on `Developments in Soil Science : 2000' was organized on 27th, 29th and 30th December 2000 in which around 85 oral presentations and 270 poster presentations were made.

65th Annual General Meeting

The 65th Annual General Meeting of ISSS was held on 28th December 2000. Dr. M. Velayutham, President of ISSS presided over the meeting, which was attended by nearly 165 members of the Society. *The business of the meeting as per the agenda, was transacted.*

Concluding Session

A concluding session was held on 30th December 2000. An overview of the Special Symposium as well as the National Seminar was undertaken. Members were requested to present their views on the several activities carried out during the preceding four days. Very useful and constructive suggestions were made for improving the programmes of not only the Annual Convention but also the ISSS activities in general. Finally Dr. M. Velayutham delivered the Presidential Address, in which he endorsed the following views:

(a) The discipline of Soil Science demands an integration and coordination of the existing body of knowledge.
(b) A Soil Scientist remains necessarily a complex entity, and he/ she is dependent on the support of geologists, chemists, physicists, botanists, microbiologists and specialists in many other fields and aims at unification within diversity as well.

He emphasised that the 'soil' was an important component of 'sustainable development'. For this the following points need to be addressed:

- The information on agro-ecological zones and soil units in different soil maps should be utilized for determining the production potential at different levels of input.

- Identification of thresholds of soil characteristics which can serve as indicators of soil unsustainability.
- Long-term effects of inter-cropping and mono-cropping systems on sustainable soil productivity need to be studied.
- Full exploration of impact of tropical cropping systems on soil biology has to be undertaken.
- Problems of fodder production, agro-forestry systems, commercial vegetable farming and fruit and palntation crops need to be tackled more intensively by soil scientists.
- Modern technology like remote sensing, Geographic Information System (GIS), Information Technology (IT) have to be utilized in the execution of Natural Resources Management (NRM) programmes.
- Education in Soil Science inculcating a knowledge on importance of soil, land, and other natural resources for sustenance of all living beings on this fragile planet 'Earth', starting at the grassroot level (school children, lay persons, etc.) and going up to the higest level of policy planners, personnel of developmental programme implementing agencies, political leadership is to be embarked simultaneously across the spectrum.
- Development of Soil Information System for devising, adopting and evaluation of scientific land use planning is to be undertaken on priority.
- Members of ISSS should produce material for popular magazines, trade journals and also for dissemination on world wide web in simple and easy to understand language.
- The fundamental challenge locally and globally is: How to convince politicians and urban and rural people that a great deal of soil science knowledge is seriously under-utilized.
- Often soil scientists fail to work in cooperation with farmers and other stake-holders.
- The challenge of soil science is to assert itself as an independent discipline with a coherent body of knowledge about natural bodies on the landscape. This is best achieved by collaboration with other disciplines. An insular discipline will not survive.
- Besides finding solutions to soil problems, indepth studies for questions "how" and "why" will become as important as the solution.

The technical sessions were formally concluded.

Cultural Programme

A cultural programme was arranged on 27th December 2000, which was presented by a professional group consisting of young artists. Classical as well as folk songs and dance forms representing the various regions of the country were presented. This programme was enjoyed by every one and applauded by all.

Field Trip

A field trip was organized on 31st December 2000 in which about about 100 delegates joined. The group was taken by bus to nearby places to look at several landscape features, soil profiles, natural vegetation, farming practices, soil-water conservation measures, etc.

G. Narayanasamy
Secretary, ISSS

International Workshop on "Integrated Soil Management of Problem and Degraded Soils, Including Salt-Affected Soils" (SPUSH* 2001)

The Workshop was held in Valencia, Spain, 7-11 May 2001, organized by the Universitat de Valencia, the Food and Agriculture Organization of the United Nations and the International Union of Soil Sciences (Subcommission A).

Participants from 19 countries worldwide attended the conference (Cuba, Mexico, Brazil, Ghana, Ethiopia, South Africa, Egypt, Turkey, Iran, Italia, Uzbekistan, Poland, Romania, Ukraine, The Philippines, Spain (FAO-IUSS SPUSH network members), USA, Algeria and New Zealand (observers).

During the opening Ceremony, chaired by H. E. Dr. Francisco Tomas Velarde, Vice-Rector of Research, Universitat de Valencia (host Institution), with welcoming addresses of Dr. Jorge Batlle-Sales, Organizer of the Symposium and Secretary of the IUSS-Subcommission A; Dr. Amin M. Mashali, FAO representative; H. E. Da Paloma Gomez Ossorio, Directora General de Planificacion y Gestion del Medio, representative of the Regional Government, the relevance of the topic of the conference for the agriculture and environment in the Region Valenciana and at a global scale was highlighted.

The Meeting Agenda included presentation of National Papers by the Network Members and observers, two working sessions devoted to discuss the issue of management of problem and degraded soils and elaborate recommendations and a special session demonstrating the use of computer models for simulation of salinity processes. One-day field excursion was organized for visiting wildlife and agricultural areas affected by salinity, where the actual soil/water/ecosystem management was discussed.

The proceedings of the SPUSH 2001, containing the full papers and recommendations of the conference, can be obtained from FAO or contacting the editor, Jorge.Batlle@uv.es

J. Batlle Sales, Valencia, Spain

* Sustainable Productive Use of Salt Affected Habitats

4th International Scientific Conference on "Humic Substances in Ecosystems"

In the 4th International Scientific Conference on "Humic Substances in Ecosystems" was held in *Rackova Dolina* (High Tatras, Slovakia), organized by the Department of Pedology and Geology (Slovak Agricultural University, Nitra) from 10 to 14 June, 2001. This series of conferences could be continued thanks to the enthusiasm and cooperation of the Drs. P. BIELEK, S. GONET, and A. ZAUJEC. The conference had the follwing topics:

a) transformations of organic matter is soils, sediments and water,
b) turnover of organic carbon and humic substances in ecosystems,
c) structure and properties of terrestrial and aquatic humic substances,
d) organic fertilizers and preparations from organic wastes, and
e) humic substances and soil organic matter in university education.

The different sessions of the conference were conducted by the chairpersons Profs. G. Barancíková, J. Drozd, J.F. Gallardo, S. Gonet, J. Koper, and J. Weber. There was also an excursion to the High Tatras mountains, to a glacial lake (*Popradske pleso*).

More than 50 participants from the Czech Republic, Germany, Poland, Spain, and Slovakia attended, there were 19 oral and 14 poster presentations. An award was bestowed on Dr. A. ZAUJEC for 15 years

of cooperation between University of Technology and Agriculture, Department of Environmental Chemistry, Bydgoszcz, Poland and the Slovak Agricultural University, Department of Pedology and Geology, Nitra, Slovakia, in the final session. The participants appreciated the perfect organization of the conference. In addition, a final barbecue closed the conference.
A selection of papers presented at the conference will be published in the International Journal of "Humic Substances in the Environment" <humus@wr.atr.bydgoszcz.pl>. Additional information about this meeting and the proceedings can be obtained from A. ZAUJEC <Anton.Zaujec@uniag.sk>.

Juan F. Gallardo
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VI Workshop on Soil Anthropization

editor Dr. Jaroslava Sobocká
Soil Science and Conservation Research Institute
Bratislava Slovakia

Soil anthropization is a unique, world-wide process of pedogenesis. It has gained importance during the last decade mainly in Europe with its very dense population and a great number of large cities concentrated in a relatively small area. Therefore a cycle of expert summit meetings was started relatively recently.

From June 20 to 22, 2001 the sixth of these meetings took place in Bratislava, on the premises of the Soil Science and Conservation Research Institute, Bratislava, Slovakia. The meeting was opened with speeches by Dr. P. Bielek and Dr. J. Sobocká.

Prof. W.E.H. Blum, the Secretary-General of IUSS, giving his lecture

Dr. J. Sobocka, Ass.Prof. Bedrna and Ass. Prof. P. Bielek, director of the Soil Science and Conservation Research Institute Bratislava

The audience, including leading European experts was subsequently addressed by the following personalities: Prof. W.E.H. Blum, Prof. W. Burghardt, Prof. M. Stroganova, Prof. J. Kozák, Prof. J. Nìmeèek, Prof. O. Nestroy, Dr. V. Tonkonogov, Prof. B. Sapek, Prof. B. Juráni, Ass. Prof. Z. Bedrna, all of them from Europe, and others, e.g. Prof. G.W. Petersen, from the USA.

The problems that were discussed concentrated on topics dealing with anthropogenic soils, including soils of urban and industrial areas, problems concerning their classification, their multi-functional use management, their dynamics, and the aspects of health, as well as human hygiene in these areas. A very important block of these lectures was focused on the problems of effective soil conservation.

Concrete pedological problems were discussed directly in the field at soil profiles in the southwestern part of Slovakia.

Pavel Jambor,
President, Slovakian Soil Science Society

NEWS FROM REGIONAL AND NATIONAL SOCIETIES

Sociedad Colombiana de la Ciencia del Suelo - Colombian Soil Science Society

The Colombian Soil Science Society has elected a new Board for the period of 2000-2002:

President:	Alvaro García Ocampo
Vice President:	Hugo Castro Franco
Members:	Substitute Members:
Alvaro García	Alberto González
Hugo Castro	César Baquero
Amando Castilla	Raúl Zapata
Iván Darío Bustamente	Hernán Burbano
Jesús Rengifo	Alvaro Tamayo
Financial Auditors:	Gladys Vallejo, Antonio López
Executive Secretary/Treasurer:	Francisco Silva Mojica
Secretary:	Gabriela Estrada

Next congress:
The XI Colombian Congress of Soil Science will be held in Cali in 2002.

Past congress:
The X Colombian Congress of Soil Science took place in Medellín, in October 2000 and was attended by 600 delegates. 180 contributions were presented in the fields of soil fertility, soil chemistry, soil physics and technology, and soil biology.

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Executive Secretary
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Ecuadorian Society of Soil Science
(Sociedad Ecuatoriana de la Ciencia del Suelo)

During the Ordinary Assembly of the Ecuadorian Society of Soil Science the following Board was elected:

President:	Ing. Bosco Bravo
Vice-President:	Dr. José Espinosa
Secretary:	Ing. Nelson Motato
Treasurer:	Ing. Francisco Mite
Board Members:	Dr. Fausto Maldonado
	Ing. Max Iñiguez
	Dr. Marcelo Calvache
	Ing. Juan Córdova

The address of the Ecuadorian Soil Science Society is:
Gaspar de Villarroel # 154 y Eloy Alfaro
Casilla 17-17-980
Quito, ECUADOR
E-mail: secs@uio.satnet.net

or:

Apartado No. 100
Portoviejo, ECUADOR
E-mail: bcl@ecua.net.ec

Successful re-establishment of a national soil science society and the first national soil science conference in Finland

In the spirit of new organisational changes within the IUSS, the Finnish Association of the ISSS was re-established in November 1999 as a national society, The Finnish Society of Soil Sciences. The main aim of the new society is to bring together soil scientists and experts dealing with soils in Finland. In 2000, new legislation was ratified, the society was officially registered and an application was made for membership of the Federation of Finnish Learned Societies. Application for affiliation to the IUSS, as a society member, was also granted. The committee has initiated a full programme of new activities including seminars, excursions and national soil science conferences. The new society also started a successful membership drive via new www- sites and e-mail circulation. As a result the number of the members in the society has increased from 60 to 175, and we still believe there is potential to further increase in the future. Universities, Research Institutes and public and private sector institutions are well represented.

The participants of the Congress

The first Soil Science Conference in Finland took place on 21 and 22 November 2000 in Helsinki. The main aim of the first national conference was simply to provide a forum where Finnish experts working with soils issues could get to know each other and learn more about what is going on in the various disciplines represented. The theme "Soil science in the service of mankind" was inspired by the theme "Man – Soil" of the 16th World Congress of Soil Science in Montpellier, France in August 1998. Under this theme, the conference held four sessions – Finnish soils, soils and the biosphere, soils and water and soils and the atmosphere. With these session themes we wanted to emphasise the importance of soils and soil science in key issues dealing with the well being and survival of mankind; healthy food and a clean environment for all mankind and the biosphere on this lonely planet which now faces new challenges to feed its' growing human population and its variable, and we may often say peculiar and even disastrous needs.

The organisers were positively surprised by the attendance of 135 soils science specialists at the conference. We were especially happy that delegates represented all major fields of soil science; in attendance were scientists from geological, soil, environmental, forestry and agriculture disciplines. The audience enjoyed the 35 presentations, 25 posters and the good company of colleagues during the two day conference. We were particularly honoured to host Professor Winfried E H Blum, Secretary General of IUSS, who presented the opening key note paper "Challenges for soil science at the dawn of the 21st century". In addition to the scientific program, normal social events which included a banquet were arranged. At the end of the conference the audience and the organisers expressed, through a questionnaire, their great satisfaction with the very first Finnish national conference on Soil Sciences. It was decided that the second national conference will be held in two years time in the autumn 2002.

The young society also celebrates its 30th anniversary in 2001, as its predecessor was established on 16 April 1971. This year we intend to stabilise our activities by organising seminars and excursions. For the 30th anniversary meeting we will prepare a report on the status of soil science research and education in Finland.

More information on the Finnish Society of Soil Sciences and the First Finnish Soil Sciences Conference, including extended abstracts with English titles and some English abstracts, can be found on our web site http://honeybee.helsinki.fi/sms/.

Prof Martti Esala, President of the Finnish Society of Soil Sciences
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Georgian Society of Soil Science

The congress of the Georgian Society of Soil Science was held on April 19, 2001.

Prof. Tengiz F. Urushadze was re-elected President of the Society.
The Vice-Presidents are: *Prof. Nikolai Iashvili, Prof. Shakro Palavandishvili*, and *Prof. Gogola Margvelashvili*.
The Secretary is *Prof. Vladimir Leshava*.

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Tel: +995 32 99 65 26
E-mail: tengiz.urushadze@mailcity.com

Working Group "Soil Science in School and Adult Education" of the German Soil Science Society

The Working Group "Soil Science in School and Adult Education", which has been set up by the German Soil Science Society, presents its aims and activities at its homepage: http://www.aw.fh-osnabrueck.de/akboden.

It is the objective of the working group to transfer soil aspects to neighbouring disciplines and to the general public, where soils are frequently under-appreciated. Through its internet presentation, the working group focusses particularly on assisting teachers and persons teaching natural science subjects at various levels of education.

The homepage covers: (1) a list of scientists all over Germany, who are willing to assist local teachers in order to include various soil aspects in their teaching; (2) a catalogue with media (printed matter, multimedia, etc.), which might help to promote the use of soils information in the educational sector and towards the general public and to make the public aware of the consequences of human activities on ecosystems; and (3) topics of immediate interest, current affairs and special issues (recent publications, exhibitions, internet links etc.).

K. Mueller, Osnabrueck, Germany.

Indian Society of Soil Science

These are the office bearers for the year 2001:

President:	Dr. P.K. Chhonkar
Vice-Presidents:	Dr. N.K. Tomar and Dr. A.K. Singh
Secretary:	Dr. G. Narayanasamy
Joint Secretary:	Dr. R.K. Rattan
Assistant Secretary:	Dr S. Bhadraray
Treasurer:	Dr. Dhyan Singh
Chief Editor:	Dr. T.D. Biswas

The address of ISSS is:

Indian Society of Soil Science
Division of Soil Science
Indian Agricultural Research Institute
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Contact: Dr G. Narayanasamy, Secretary

Phone: 0091-11-5850991
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Email: isss@vsnl.com
Web page: www.indiansocietyofsoilscience.org

Soil Science Society of Iraq (SSSI)

On March 26, 2001, the Soil Science Society of Iraq elected its second national Executive Board for the period 2001-2003:

President:	Prof.Dr. Mahdi I Aoda
Vice-President:	Prof.Dr. Ahmed AL-Zubaidi
Secretary:	Prof.Dr. Khalid B. Hummadi
Treasurer:	Dr. Ahmed S. Muhaimeed
Members:	Prof.Dr. Waleed K. AL-Agidi
	Dr. Ali A Fahad
	Asst. Prof. Dr. Salman K. Essa

Address of the Society:
The Iraqi Society of Soil Science
Baghdad – AL – Karkh post office
AL-Dawoodi
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Morphogenetic Soil Classification System of Slovakia

Only at the end of 70ties the efforts to unify soil classification have obtained a concrete shape. During the 6th Czechoslovak Soil Science Conference (Nitra, 1985), the unified Morphogenetic Soil Classification System was approved for Czechoslovakia. In 1991, the system was improved and the authors J. Hrasko, J. Nemecek, and B. Surina published a second issue of the classification system. The system served well for the soil scientists in Slovakia and Bohemia. However, it needed improvement and perfection. Therefore, in 2000 the Societas Pedologica Slovaca issued the "Morphogenetic Classification System of Soils of Slovakia" at the Editorial Centre of the Soil Science and Conservation Research Institute, Bratislava.

In comparison with the former edition, the new Morphogenetic Soil Classification System of Slovakia differed in the following details:
- the group of anthropic soils was treated in more detail;
- Fluvisols were differently placed within the system;
- texture was the criterion for all soil types;
- some soil horizons were newly defined, quantified and signed;
- a new classification of parent material (rock) was adopted;
- textural classes were distinguished following the world systems;
- some soil types with problematic occurrence in Slovakia were omitted;
- soil classification was closely compared with WRB taxonomy;

The development of the classification system was a teamwork of pedologists active in agriculture and forestry, some of them working at universities. Contradictions were unavoidable at the beginning. However, finally a solution was found, which was acceptable for everybody.

Those who worked actively and directly in the group of classification and comparison to the World Reference Base deserve particular acknowledgement, they were indispensable: Dr. J. Sobocka, Assoc. Prof. Z. Bedrna, Assoc. Prof. J. Curlik, Assoc. Prof. B. Jurani and Dr. B. Surina.

Many thanks also to Assoc. Prof. P. Bielek, Director, Soil Science and Conservation Research Institute, and Dr. P. Jambor, President, Societas Pedologica Slovaca.

Dr. Pavel Jambor,
President,
Societas Pedologica Slovaca
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827 13 Bratislava, SLOVAC REPUBLIC

Soil and Plant Analysis Council, Inc.

(621 Rose Street, Lincoln, NE 68502-2040, USA. Phone: 402 437-4944; Fax 402 476-7598; E-mail: bvaug12345@aol.com; website: http://www.spcouncil.com).

Executive Board 2001-2002

President:	Yash P. Kalra, Edmonton, Alberta, Canada
Past President:	Bob Beck, Johnston, Iowa
Vice President:	Robert Miller, Ft. Collins, Colorado
Secretary/Treasurer:	Byron Vaughan, Lincoln, Nebraska

Individual Class Board Members
Vince Haby, Overton, Texas
Hailin Zhang, Stillwater, Oklahoma

Laboratory Class Board Member
Robert Deutsch, Northwood, North Dakota
Roger Eliason, St. Paul, Minnesota
Mark Flock, New Knoxville, Ohio
Karen Gartley, Newark, Delaware
Richard Large, Memphis, Tennessee
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INTERNATIONAL RELATIONS

NEW WAVES IN SOIL SCIENCE IV

Since several years the International Training Centre for Post-Graduate Soil Scientists of the Ghent University (ITC-Gent) organises advanced training courses for its alumni. After SE-Asia (Yogyakarta, 1993), Africa (Harare, 1994) and the Mediterranean area (Tunisia, 1997) it was the turn of South- and Latin-America.

Participants of the training course

The course was organised on the initiative of Prof. Dr. G. Stoops at the University of Cuenca, Ecuador. Ir. P. Cisneros and Ir. G. Dercon of PROMAS (Programa para el manejo del Agua y del Suelo, University of Cuenca) directed the local organisation, including the field excursions. 37 alumni and invited soil scientists of 8 different countries (Argentina, Bolivia, Costa Rica, Cuba, Ecuador, Mexico, Peru and Suriname) participated in the course, even as members of the teaching staff of the course programme on Physical Land Resources from the Ghent University (Professors R. Goossens, R. Hartmann, G. Hofman, G. Stoops, O. Van Cleemput, J. Vanderdeelen, E. Van Ranst and H. Verplancke), Prof. S. Deckers (KU Leuven) and Dr. R. Hofstede (Proyecto Paramo, Quito).

The course started on January 15th, 2001 in Cuenca, and ended on January 25th in Machala. Apart from the traditional lectures by the staff and invited speakers, and presentations of scientific papers by the participants, the course comprised five field excursions, ranging from the Paramo (Cajas, over 4000 m altitude) to the acid sulphate soils of the shrimp farms at the sea side, passing through the arid zone of Jubones, giving the participants the occasion to compare and discuss a large range of soils, ago-ecological zones and soil management systems. Profile descriptions, routine analyses, clay mineralogy and micromorphological descriptions were available for each profile, allowing an intense discussion on pedogenesis, classification and soil management.

To the satisfaction of all participants the meeting amply succeeded in its aims: transfer of knowledge on modern achievements in soil science, activation of regional south-south communication between soil scientists and strengthening the links between the alumni and the Ghent University..

Prof. Dr. G. Stoops

APPOINTMENTS, HONOURS, PERSONAL NEWS

Prof. Larry Wilding received the Kubiena Award at the International Working Meeting on Micropedology, which was held from 9-13 July 2001 in Ghent, Belgium,. It was handed over by Dr. Fabio Terribile on behalf of Subcommission B of the IUSS. At present, the Kubiena Award is the only existing award within the IUSS.

Prof. Gerard Bolt was presented an honorary degree from the University of Guelph, Canada. Prof. Bolt held the Chair of soil chemistry and soil physics at the University of Wageningen in the Netherlands. He served as Chair of Commission I (Soil Physics) and later of Commission II (Soil Chemistry) of the International Society of Soil Science.

Prof. Nicola Senesi, Professor Soil Chemistry at the University of Bari, Italy, Past-Chairman of the IUSS Commission II-Soil Chemistry and former President of the International Humic Substances Society (IHSS), has been conferred the title of Doctor Honoris Causa from the Institut National Polytechnique de Toulouse (INPT), France, during a ceremony held on May 18, 2000, at the Ecole National Superieure Agronomique de Toulouse (ENSAT).

Prof. John Ryan has been honored with the University of Arizona Alumni Association's distinguished Citizen Award.

Dr. David Kaimowitz has been appointed as the new Director General of the Center for International Forestry Research (CIFOR), in Bogor, Indonesia.His term of office will will start on 1 August 2001.

Dr. Dennis Garrity will succeed Dr. Pedro Sanchez as Director General of the International Centre for Research in Agroforestry (ICRAF), in Nairobi, Kenya, on 1 October 2001.

The following soil scientists were elected **Fellows of the Soil Science Society of America** at the 2000 Annual Meeting:
M.A. Arshad, D.A. Graetz, D.B. Jaynes, Th.E. Loynachan, R. Naidu, D.E. Radcliffe, Ch.W. Rice, C.J. Richardson, J.C. Ritchie, K.M. Scow, D.M. Sylvia, M.J. Veprascas, W. Wood, and M.L. Brusseau.
The **Soil Science Research Award** of the SSSA was presented to **P.M. Huang**,
the **Soil Science Applied Research Award** to **J.Th. Sims**,
the **Soil Science Professional Service Award** to **B.A. Stewart**,
the **International Soil Science Award** to **M.E. Sumner**,
the **Soil Science Education Award** to **J.A. Sandor**,
the **Marian L. and Chrystie M. Jackson Soil Science Award** went to **D.A. Laird**, the **Don & Betty Kirkham Soil Physics Award** to **B.E. Clothier**,
the **Emil Truog Soil Science Award** to **K.R. Brye**,
the **Soil Science Distinguished Service Awards** to **H.E. Dregne**, **D. Keeney**, and **C.H.M. van Bavel**, while **J.M. Tiedje** received the **Francis E. Clark Lecturer Award** and **D.W. Cole** the **S.A. Wilde Lecturer Award**.

Johan Bouma, *Professor of Soil Inventarisation and Land Evaluation at Wageningen University, and* member of the Netherlands Council for Government Policy, was awarded the title Officer in the Royal Order of Orange Nassau.

Prof. Wladimir A. Puggina, President of Fertibras, was elected President of IFA At the Annual General Conference of the International Fertilizer Industry Association (IFA) in Sydney,. Prof. Puggina was for more than ten years active in the IFA Executive Committee. He is Professor of Finance at the São Paulo School of Business (Getulio Vargas Foundation).

Philippe DUCHAUFOUR, A great name in Soil Science

Philippe Duchaufour, who was born on June 23, 1912 , unfortunately passed away on December 2, 2000.

After brilliant studies of agronomic engineering at the National Agronomic Institute, with a Master's degree in natural sciences, he entered the "École Nationale des Eaux et Fôrets". After finishing his studies at this renowned institution, he immediately was made Deputy Director of the Botanic Research Station in Nancy. During the war, he worked as Professor of Ecology at the "École d'Ingénieurs des Travaux des Eaux et Forêts" (School of Water and Forest Engineers) at Barre, near Montargis, where he began to prepare his thesis. In 1945, he returned to the "École Nationale des Eaux et Fôrets" in Nancy.

He defended his PhD thesis: "Recherches écologiques sur la chênaie atlantique française" in 1947. It demonstrated, based on the the investigation of soils and types of vegetation of different forests in the Loire Valley, of the Armorican massif and of the Gascogne heathland, interrelations existing between parent-materials, vegetation, forest species, humus types and soils. He proved that each of these factors reacted on the others, which could even lead to regressive evolution: from brown soils to podzols,or, under certain conditions, to progressive evolution: from podzols or podzolic soils to brown leached soils. Much importance was given to the fact that vegetation and soils evolved parallel to each other.

This doctoral thesis was one of the first, maybe actually the first one in France, to be devoted mainly to pedology, a relatively young branch of science and, as he said later on, the "difficult but fertile science", had a great impact on universities.

After that, he worked for 14 years as a professor of pedology and geology at the National Forestry School where he won an excellent reputation as a teacher, due to his ability of expressing complex ideas clearly, but also due to the practical aspects of forestry that he suggested. During these 14 years, between 1949 and 1962, he developped aspects of applied pedology and forest management, for instance the study and mapping of forest sites, the development of research techniques regarding the mineral nutrition of forests and forest fertilisation. At the same time he continued his fundamental research work on pedogenesis, following the ideas outlined in his thesis, in order to improve the distinction between leaching and podzolisation and the characterisation of the different humus types on a chemical level.

In 1961, after numerous requestes, he finally agreed to join the University of Nancy as a professor, and to create the Centre for Biological Pedology of the CNRS, of which he became the Head. He held these functions until his retirement in 1975.

He also introduced a certificate of pedology at the University, at the level of Master of Science, and two "DEAs": one of General Pedology, another of Agro-Eco-Pedology. Both of them were a great success. His outstanding teaching qualities were unanimously recognized. His works on pedogenesis, and the publication of successive versions of the french soil classification, some of them together with Professor George Aubert, made him well-known all over the world. Under his guidance, excellent researchers whom he recruited for the Pedology Center of Nancy, considerably improved the knowledge of pedogenesis, humus morphology and chemistry, but they also iniciated a new development in soil microbiology, a necessary complement to physico-chemistry.

On a human level, his main qualities were unpretentiousness and fidelity to his friends. He never hesitated to agree to the opinion of one of his colleagues, even if they were quite young, provided that they

gave him solid arguments. Philippe Duchaufour is the author of numerous books on pedology, some of which have been translated into English, Russian, Spanish or Japanese: the "Traité de Pédologie", edited by the School of Forestry in 1956, then the "Précis de Pédologie" (3 editions between 1960 and 1970), together with an Ecological Atlas of Soils of the World, than "Pedology" in two volumes: "I - Pedology and Classification" and "II - Constituants and Properties of Soils", the second one in collaboration with numerous researchers of several Universities, the CNRS and INRA. His last work: "Abrégé de Pédologie", is a particularly great success. The sixth and last edition of it is just being published under a new title: "Introduction à la Science du Sol – Sol, végétation, environnement". Philippe Duchaufour of course published numerous papers in the best journals of soil science. As to soil mapping, at the time when the Soil Survey Unit of France was created in 1968, he was one of the first to propose a soils inventory of one of the most beautiful and varied regions of France, one which he knew very well: the Vosges Massif. Since that time, he always strongly supported soil mapping actions.
Philippe Duchaufour was President of the French Soil Science Society and Life Member of its Administrative Committee.
His activities on the international level have been remarkable as well. It must be mentioned that he participated in the organisation of the VIth World Congress of Soil Science wich took place in Paris in 1956, and that he was still a member of committees in the preparation of the XVIth World Congress of Soil Science in Montpellier in 1998. These activities led to his election as an Honorary Member of the International Society of Soil Science.
He was an indefatigable and passionate worker, and till his demise at the age of 88 years, he always maintained his knowledge on the evolution of the science to which he devoted his whole life, perfectly up to date, still giving time and again help to workshops, colloquia and the orientation of young researchers.
With Philippe Duchaufour disappeared one of the major scientists of soil science in France and on a world-wide level.

M. Bonneau and M. Jamagne

JOHANNA DÖBEREINER

1924 – 2000

49 years dedicated to research in Soil Microbiology

Johanna Döbereiner was born in Czechoslovakia, studied agronomy at the University of Munich, West Germany, and emigrated to Brazil in 1951 where she started to work in the Soil Microbiology Laboratory in the National Department for Agricultural Research (DNPEA) of the Ministry of Agriculture in Seropédica, Rio de Janeiro. She became a Brazilian citizen in 1956 and completed Post-graduation at the University of Wisconsin in 1963.
From 1963 to 1969, when few scientists believed in the importance of biological nitrogen fixation (BNF) to compete with chemical fertilisers, Dra. Döbereiner led a group of students in the research on the factors which were limiting BNF in tropical legumes. Since that time, most of the research in this area in tropical regions has been influenced to some degree by the discoveries of Dra. Döbereiner, or stimulated by her enthusiasm.
The Brazilian soybean-breeding program, which was started in 1964, was also influenced by the work of Dra. Döbereiner. It became a very successful program, based entirely on the belief that all necessary plant nitrogen could be derived from biological nitrogen fixation. Without the use of nitrogen as fertiliser for soybean, Brazil wouldn't have been able to compete successfully on the international market and would not be the world's second largest producer of this crop today. The total reliance on BNF saves the country the estimated amount of more than one billion US Dollars per year.
The energy crisis of the 70s renewed interest in nitrogen fixation research and in this context the association between grasses/cereals and N2-fixing bacteria. Dra. Döbereiner was at the centre of these studies since the early discovery of Azotobacter paspali associated with the roots of Paspalum Notatum and the "endophytic" associations of N2-fixing bacteria within the plant tissues of grasses/cereals and root

crops. These studies resulted in the discovery of nine previously unknown species of N2-fixing bacteria associated with grasses, cereals and root crops.
The most spectacular results with grasses were observed with some varieties of sugar cane which were found to be able to produce the equivalent of 160 tonnes per hectare with up to 200 kg N derived from the association with N2-fixing bacteria. According to the newspaper "Folha de São Paulo" (21/05/95), Johanna Döbereiner was 7th amongst all Brazilian scientists in the ranking of citations of her publications, and first amongst female scientists.
Although her scientific contribution was immense, this is not the most relevant aspect of her career. Her leadership and enthusiasm were even more important, not only for Embrapa Agrobiology, which was founded as a direct result of her leadership, but also for all the scientists who were trained and inspired by her, many of whom hold leading positions in the scientific community today.
Her work has been recognised world-wide in various manners as it is evidenced by the long list of prizes, homage and distinctions, both national and international: Doctor Honoris-Causa of the University of Florida, USA, and the Universidade Federal Rural do Rio de Janeiro, Member of the Brazilian Academy of Sciences and both the Vatican and Third World Academies of Sciences, the National Frederico de Menezes Viega Prize, the OAS Bernard Houssay Prize, the UNESCO Science Prize, the Prize for Science and Technology of Mexico, Order of Rio Branco, Order of Merit of the National Judiciary and the Order of Merit of The Federal Republic of Germany.
But above all, those who understood her strong personality prized her friendship, her encouragement, and her capacity to face work as happy and enthusiastic as a person going on holiday. Johanna was more than a leader; she was a mother, a great friend and a motive for pride for all of us who have worked directly with her.

Maria Cristina Prata Neves
Embrapa Agrobiology

A.A. KLINGEBIEL
(1910-2001)

Albert A. Klingebiel died 29 March 2001 at the age of 90 years. He studied at Iowa State University agronomy and soil microbiology. His career started with the USDA Forest Service, prior to being a soil scientist with the Soil Conservation Service (SCS) in 1938. In 1954 he became Assistant Director and eventually Director of Soil Interpretations for the SCS, serving in this position until his retirement in 1973.
Dr. Klingebiel's major contributions to soil science were in the development and application of soil survey interpretations for various uses. His book: "The Use of Soil Surveys in Land Use Planning" is well known, also outside the United States.
In 1950, he received the USDA's Superior Service Award for developing techniques and procedures for presenting soil survey information to users and for methods used in training new employees therein.
After his retirement, the methods he developed for determining soil potential for producing food and fiber using satellite imagery resulted in several publications. He related observable soil differences on Landsat imagery to other resource data, to produce information about location, extent, quality and limitations of soil to produce food and fiber.

Hans van Baren, Wageningen, The Netherlands

A.P.A. VINK
1920 - 1999

A.P.A. Vink, retired professor of soil science at the University of Amsterdam, died on 9th September 1999 at the age of 77. He studied soil science at the Agricultural University in Wageningen under the famous professor Edelman, who trained a whole generation of later on well known Dutch soil scien-

tists. Like many of his fellow students who graduated after the Second World War, he started his career in Indonesia, studying the soils of tea plantations. After his return to the Netherlands, he was employed at the Dutch Soil Survey, where he played a leading role in the practical application of soil survey results. During that time he started to contribute to the development of land evaluation at an international level, which led him from the Dutch Soil Survey to the international atmosphere of the ITC, where he trained a large number of students from developing countries in hypsographic soil survey, air photo-interpretation and land evaluation. It was in this 6-years period that he laid the foundation for the systematic approach in soil survey and land evaluation which he published in a series of papers, reports and books, used by many students and fellow soil scientists.

In 1965, he was appointed Full Professor in Soil Science at the University of Amsterdam, where he continued his activities in the field of soil survey and land evaluation, becoming one of the world's leading experts in land evaluation and contributing significantly to the FAO land evaluation system. He thus became one of the founders of landscape ecology and multidisciplinary environmental studies in the Netherlands, and expressed his views with much energy and very convincingly. At the University of Amsterdam, from which he retired in 1984, he created his landscape and land evaluation oriented 'Vink-school' of soil scientists, of which many came to work in developing countries, thus spreading his approach and ideas.

During his later professional life, he remained very much interested in international developments in his field and the colleagues involved. He was a very hospitable and amiable man, who had many friends among his colleagues, both in the Netherlands and abroad. He will be remembered as a good friend and colleague by the many fellow soil scientists with whom he collaborated in the past.

J. Sevink, The Netherlands.

Walter H. Wischmeier
(1911 – 2001)

Prof. Walter H. (Walt) Wischmeier died on 10th February 2001 at the age of 90 years. Along with Mr. Dwight Smith, he was responsible for the development of the Universal Soil Loss Equation (USLE), which was first published comprehensively in 1965 as Agricultural Handbook No. 282, entitled Predicting Rainfall-Erosion Losses from Cropland East of the Rocky Mountains—Guide for Selection of Practices for Soil and Water Conservation. In 1978 this handbook was revised and published as Agricultural Handbook No 537, titled Predicting Rainfall Erosion Losses—A Guide to Conservation Planning. These two Handbookks were not only used by the US Soil Conservation Service, but have served as a basis for much of the erosion modeling still being done today in many countries, e.g. the Revised Universal Soil Loss Equation (RUSLE), the Water Erosion Prediction Project (WEPP) and a number of others.

Prof. Wischmeier received two Superior Service Awards from the Agriculture Research Service, where he worked from 1940 until his retirement in 1975. After a number of other positions he was leader of the National Erosion Data Center in Purdue from 1955 until 1975. He also received the Hugh Bennett Award, the highest award conferred by the Soil and Water Conservation Society..

MEETINGS, CONFERENCES, SYMPOSIA

Important Notice

IUSS, as a Scientific Union Member of the International Council for Science (ICSU), subscribes to the principle of free movement of bona fide scientists; patronage or sponsoring will therefore automatically be withdrawn if the country of venue denies or purposely delays visa awarding to any IUSS member who wishes to participate in the meeting concerned.

2001

2º Congreso Iberoamericano de Química y Física Ambiental, Habana, Cuba, 5 – 9 de noviembre de 2001.
Información: Dr. Adriano Cabrera Rodríguez, Presidente del Comité Cientifico, Instituto Nacional de Investigaciones de la Caña de Azucar, Ave. van Troi #17203, Boyeros, CP 19 210, C. Habana, Cuba; Tel: +537-579-076; Fax: +537-666-036; E-mail: adriano@inica.edu.cu.

6th ISRR Symposium on Roots: The Dynamic Interface between Plants and the Earth, Nagoya, Japan, November 11-15, 2001.
Information: Website: www.soc.nacis.ac.jp/jsrr/isrr/.

22nd Annual SETAC Meeting – "Changing Environmental Awareness: Societal Concerns and Scientific Responses", Baltimore, USA, November 11-15, 2001.
Information: SETAC, 1010 North 12th Avenue, Pensacola, FL 32501-3367, USA; Tel: +1-850-469-1500; Fax: +1-850-469-9778; Website: www.setac.org.

XV Latin American Congress of Soil Science CLACS-2001, Varadero Beach, Cuba, 11 to 16 November, 2001.
Information: Dr. Rafael Villegas Delgado, President, and Dr. Olegario Muñiz Ugarte, Chairman of the Scientific Committee, Ave Van Troi No. 17203, Boyeros, CP 19210, Ciudad Habana, Cuba. Fono: 53-7-579076; Fax: 53-7-666036; e-mail: XV@inica.edu.cu

1st International Symposium on Biotechnologies for Environmental Management, November 22-24, 2001, Villa Gualino, Torino, Italy.
Information: Alessandra Sberze, Fondazione per le Biotecnologie, Villa Gualino, Viale Settimio Severo 63, 10133 Torino, Italy. Tel.: +39-011-6600187; Fax: +39-011-6600708; E-mail: mail@fobiotech.org; Website: http://www.fobiotech.org.

International Symposium on "Importance of Potassium in Nutrient Management for Sustainable Crop Production in India", New Delhi, India, December 3-5, 2001.
Information: Dr. S.K. Bansal, Organizing Secretary, Potash Research Institute of India, Sector-19, Gurgaon-122001, Haryana, India; Tel.: +91-124-634-0185; Fax: +91-124-634-1792; E-mail: priiin@bol.net.in.
or: International Potash Institute, IPI Coordination India, Dr. Patricia Imas, c/o DSW, Potash House, P.O. Box 75, Beer Sheva, 84100, Israel, Tel.: +972-7-646-5647; fax: +972-7-628-0995; E-mail: particia@dsw.co.il.
or: International Potash Institute, Head Office, Schneidergasse 27, P.O. Box 1609, CH-4001 Basel, Switzerland; Tel.: +41-61-261-29-22; Fax: +41-61-261-29-25; E-mail: ipi@iprolink.ch; Website: http://www.ipipotash.org

International Conference "Geochemical processes with longterm effects in anthropogenically affected seepage and groundwater" - GeoProc2002, Bremen, Germany, March 4-7, 2002.
Information: Prof. Horst D. Schulz, Fachbereich 5 – Geowissenschaften, Universität Bremen, Postfach 330 440, 28334 Bremen, Germany; Tel: +49-421-218-3393; Fax: +49-421-218-4321; E-mail: hdschulz@uni-bremen.de; Website: www.geochemie.uni-bremen.de.

2nd International Conference on Soil Structure Interaction in Urban Civil Engineering: "Planning and Engineering for the Cities of Tomorrow", Zurich, Switzerland, March 7-8, 2002.
Information: ETH Zurich, Institute for Geotechnical Engineering, Mrs. Monica Dekanovsky, Conference Secretariat, CH-8093 Zurich, Switzerland; Tel.: +41(0)1-633-25-00; Fax: +41(0)1-633-10-79; E-mail: dekanovsky@igt.baug.ethz.ch.

1st ASEM Conference on Bioremediation, Hanoi, Vietnam, March 11-14, 2002.
Information: The Asia-Europe Environmental Technology Centre (AEETC), Technopolis, Klong 5, Klong Luang, Pathumthani 12120, Thailand; Tel: +662-577-41-91-94; Fax: 662-577-41-96; E-mail: biorem@aeetc.org.

2nd Saudi Symposium on Halophyte Plantation, Riyadh, Saudi Arabia, March 17-20, 2002.
Information: Prof.Dr. Ali Al-Jaloud, 2nd Saudi Symposium on Halophyte Plantation, King Abdulaziz City for Science and Technology, Natural Resources and Environment Resarch Institute, P.O. Box 6086, Riyadh-1142, Kingdom of Saudi Arabia; Fax: +966-1-481-3611; E-mail: aljaloud@kacst.edu.sa.

5th IFSA European Symposium "Farming and Rural Systems Research and Extension – Local Identities and Globalisation", Florence, Italy, April 8-11, 2002.
Information: Symposium Secretariat, Luigi Omodei Zorini and Caterina Contini, Dipartimento Economico Estimativo Agrario e Forestale, P.le delle Cascine 18, 50144 Firenze, Italy; Tel: +39-055-3288240; Fax: +39-055-361771; E-mail: ifsa.symposium@unifi.it; Website: http://www.unifi.it/unifi/deeaf/ifsa.

International Symposium on "Rural Community Interaction and Workshop - Combating Desertification: Alternative Ways to Combat Desertification – Connecting Community Action with Science and Common Sense", Cape Town, South Africa, Rural Communities and Gobabeb, Namibia, April 8-20, 2002.
Information: Ms. Roben Penny, Woodbine, Essex Road, Kalk Bay, 7975 Cape Town, South Africa; Tel./Fax: +27-21-788-1285; E-mail: robenpen@jaywalk.com; Web: http://des2002.az.blm.gov.

XVIII Congreso Argentino de la Ciencia del Suelo, Puerto Madryn, Argentina, April 16-19, 2002.
Information: XVIII Congreso Argentino de la Ciencia del Suelo, Comisión Organizadora, Centro Nacional Patagónico (CENPAT), CONICET, Boulevard Brown s/n, CC 128, (U9120ACV) Puerto Madryn, Chubut, Argentina. Tel.: +54-2965-451024; Fax: +54-2965-451543; E-mail: suelos@cenpat.edu.ar.

International Conference "Soil Tolerance for Natural and Anthropogenic Impacts", Moscow, Russia, April 23-25, 2002.
Information: V.V. Dokuchaev Soil Science Institute, Pyzhevskii per. 7, Moscow 109017 Russia; Fax: +7-095-951-5037; E-mail: rojkov@agro.geonet.ru.

9th International Symposium on the Interactions Between Sediments and Water, Banff, Alberta, Canada, May 5-10, 2002.
Information: Dr. Ellen Petticrew, University of Northern British Columbia, 3333 University Way, Prince George, BC, V2N 4Z9, Canada; Tel.: +1-250-960-6645; Fax: +1-250-960-5538; E-mail: iasws@unbc.ca.

12th International Soil Conservation Organization (ISCO) Conference: Sustainable Utilization of Global Soil and Water Resources, Beijing, People's Republic of China, May 26-31, 2002.
Information: China National Administration Center for Seabuckthorn Development, Jia 1, 6th Floor, Fuxinglu, Beijing 100038, China; Tel.: +86-10-6320-4362/6320-4363; Fax: +86-10-6320-4359/6320-2841; E-mail: isco2002@swcc.org.cn; Website: www.swcc.org.cn/isco2002.

European Grassland Federation – EGF 2002: Multi-Function Grasslands – Quality Forages, Animal Products and Landscapes", La Rochelle, France, May 27-30, 2002.
Information: EGF 2002 / AFPF, INRA – Route de St. Cyr, F-78026 Versailles Cedex, France, E-mail: egf2002@lusignan.inra.fr; Website: http://www.poitou-charentes.inra.fr/egf2002.

International Conference on Sustainable Land Use and Management, Çanakkale, Turkey, June 10-13, 2002.
Information: Ilhami Bayramin, Ankara Üniversitesi, Ziraat Fakültesi, Toprak Bölümü, 06110 Ankara, Türkiye; Tel.: +90-312-317-05-50 ext: 1420; +90-312-317-84-65; E-mail: conference2002@toprak.org.tr; Website: http://ozel.gop.edu.tr/ciec2002.

6th International Conference on Precision Agriculture and Other Resources Management, Minneapolis, USA, July 14-17, 2002.
Information: Kellen Sullivan, Fax: +1-612-624-4223; sullivan@soils.umn.edu.

International Humic Substances Society 20th Anniversary Conference: "Humic Substances - Nature's Most Versatile Materials", Boston, USA, July 21-26, 2002.
Dr. Elham A. Ghabbour, Barnett Institute, 341 Mugar Hall, Northeastern University, 360 Huntington Ave., Boston, MA 02115, Tel: +1-617-373-7988; Fax: +1-617-373-2855; e-mail: eghabbou@lynx.neu.edu; Website: www.hagroup.neu.edu.

3rd International Conference on Water Resources and Environment Research, Dresden, Germany, July 22-26, 2002.
Information: Cathleen Schimmek, Gisela Schöler, Conference Secretariat ICWRER 2002, Institute of Hydrology and Meteorology, Dresden University of Technology, Wuerzburger Str. 46, 01187 Dresden, Germany; Tel.: +49-351-463-3931; Fax: +49-351-463-7162; E-mail: icwrer2002@mailbox.tu-dresden.de.

Humic Substances Seminar VI, Boston, USA, July 27, 2002.
Information: Dr. Elham A. Ghabbour, Barnett Institute, 341 Mugar Hall, Northeastern University, 360 Huntington Ave., Boston, MA 02115, Tel: +1-617-373-7988; Fax: +1-617-373-2855; e-mail: eghabbou@lynx.neu.edu; Website: www.hagroup.neu.edu.

17th World Congress of Soil Science"Soil Science: Confronting New Realities in the 21st Century", Bangkok, Thailand, August 14-20, 2002.
Information: 17th World Congress of Soil Science, Kasetsart Golden Jubilee Administration and Information Center (1st floor), Kasetsart University, P.O. Box 1048, Bangkok 10903, Thailand; Fax: (662)940-5788; E-mail: o.sfst@nontri.ku.ac.th; Web: http://www.17wcss.ku.ac.th.

2nd International Conference on Sustainable Agriculture for Food, Energy and Industry, Beijing, China, September 8-13, 2002.
Information: Dr. Fan Zengxing, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China; Tel. and Fax: +86-10-82593128; E-mail: ISAConfe@hotmail.com; lidj@ns.ibcas.ac.cn.

International Rice Congress, Beijing, China, September 20-26, 2002.
Information: www.cgiar.org/irri/irc2002/index.htm

International Symposium on Sustainable Use and Managements of Soils in Arid ands Semiarid regions. Murcia, Spain, 22-26 September, 2002.
Information: Prof. Dr. Angel Faz Cano, Secretary Organization Committee, Department of Agricultural Production, The Polytechnic University of Cartagena, Paseo Alfonso XIII, 48. 30.203 Cartagena, Murcia, Spain; Tel.: 34-968-325440; Fax: 34-968-325435; Email: sumass2002@upct.es; Web Page: http://www.upct.es/sumass2002; http://www.um.es/sumass2002

32nd IAH Congress on Groundwater and Human Development, Mar del Plata, Argentina, October 21-25, 2002.
Information: Dr. Emilia Bocanegra, Centro de Geología de Costas y del Cuaternario, Facultad de Ciencias Exactas y Naturales, Univesidad Nacional de Mar del Plata, Argentina; Tel.: +54-223-475-4060; Fax: +54-223-475-3150; E-mail: ebocaneg@mdp.edu.ar.

3rd International Symposium on sustainable Agro-environmental Systems: New Technologies and Applications, Cairo, Egypt, October 26-28, 2002.
Information: Prof. Sami Abdel-Rachman, Sympsoium Organizer/Secretary General, National Authority for Remote Sensing and Space Sciences (NARSS), 23 Joseph Brows Tito st., Elnozha Elgedida, Cairo, Egypt. P.O. Box: 1564 Alf-Maskan; Tel.: (202)2964386 – 2975688; Fax: (202)2964387 – 2964385; E-mail: sirahman@intouch.com.

2003

Hydrology in the Mediterranean and Semiarid Regions, Montpellier, France, April 2003.
Information: Dr. Eric Servat, Centre IRD Hydrologie, BP 5045, F-34032 Montpellier Cedex, France; Tel.: +33-4-679-17260; Fax: +33-4-675-7106; E-mail: eric.servat@mpl.ird.fr.

EUROCLAY 2003, Modena, Italy, June 15-19, 2003.
Information: Maria Franca Brigatti, Dipartimento di Scienza della Terra, Università di Modena e Reggio, Largo S. Eufemia 19, 41100 Modena, Italy. E-mail: ec2003@unimo.it; Fax: +39-059-2055887; www.unimo.it/euroclay2003.

FGRA – Formation en Gestion de la Recherche Agricule Pour les Chefs de Programmes des Systemes Nationaux de Recherche Agricole, organisé par le Conseil Nationale de Recherche Agricole (CNRA), Abidjan, Côte d'Ivoire, 5-17 novembre 2001.
Information: Zenete Peixoto França, Chef du service de la formation ISNAR, B.P. 93375, 2509 AJ, La Haye, Pays-Bas; Tél: +31-70349-6100; Fax: +31-7038-19677: E-mail: isnar@cgiar.org.

The International Centre for Development Oriented Research in Agriculture (ICRA), offers "Professional Training in Interdisciplinary Team Research in Agriculture" (13 weeks knowledge acquisition in Wageningen, NL, and 13 weeks professional experience in Africa/Asia/Latin America.
Information: ICRA – P.O. Box 88, 6700 AB Wageningen, The Netherlands. Tel.: +31-317-422938; Fax: +31-317-427046; E-mail: icra@iac.agro.nl; http://icra.agropolis.fr.

The International Fertilizer Development Center offers various training programs/study tours in the USA, Africa, Asia, South America and Europe.
The topics include "Agricultural Input Marketing", "Technical Training on Fertilizer Production", "Fertilizer Recommendations for Optimum Crop Production", "Modern Techniques in Fertilizer Distribution and Handling", and many more.
Information: Director, Human Resource Development, International Fertilizer Development Center, P.O. Box 2040, Muscle Shoals, Alabama 35662, USA.
Tel: +1-256-381-6600; Fax: +1-256-381-7408; E-mail: hrdu@ ifdc.org; Website: http://www.ifdc.org.

The International Institute for Aerospace Survey and Earth Sciences (ITC) offers, among others, the following courses (MSc and Professional Master degrees, modular system of courses):
- Sustainable Agriculture
- Rural Land Ecology
- Land Degradation and Conservation
- Soil Information for Sustainable Land Management
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Post-graduate Courses in Soil Science, Plant Production, and Ecology. MSc and PhD Degree, Universidad de Buenos Aires, Argentina.
Language: Spanish
Information: Ing.Agr. Marta E. Conti, Facultad de Agronomía. UBA, Escuela para Graduados, Av. San Martín 4453. (1417) Buenos.Aires, Argentina. Fax: (+541)522-1687. E-mail: conti@ifeva.edu.ar and epg@ifeva.edu.ar.

The University of Gent and the Free University of Brussels, Belgium offer:
International Interuniversity Post-Graduate Programmes in Physical Land Resources. Diploma and Master Courses.
Information: Programme Secretariat, Physical Land Resources, Krijgslaan 281 (S8), B-9000 Gent, Belgium; Tel: +32-9-264-46-18; Fax: +32-9-264-49-91; E-mail: PLRprog.adm@rug.ac.be, Website: http://allserv.rug.ac.be/~amtanghe/PLRprog.html.

The Interactive Remote Instructional System (IRIS®) is an internationally recognized distance learning program in the hydrologic and environmental sciences and engineering. This porgram provides continuing education and professional development for scientists, engineers and administrators working in the environmental field. 12-week courses are offered on:

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Information: The Center for Ground Water Management, Wright State University, Dayton, Ohio 45435-0001; Tel: +1-937-775-3648; Fax: +1-937-775-3649; E-mail: IRIS19@wright.edu; Web: http://geology.wright.edu/iris.html.

Short Postgraduate Course on Soil and Plant Analysis and Data Handling
Wageningen, the Netherlands, May1 – 26, 2000.
Organized by the Wageningen University (WU), in co-operation with the International Agricultural Centre (IAC) and the International Soil Reference and Information Centre (ISRIC).
Information: International Agricultural Centre (IAC), Lawickse Allee 11, P.O. Box 88
6700 AB Wageningen, The Netherlands; Tel.: +31-317-490-111; Fax: +31-317-418-552; E-mail: *IAC@IAC.AGRO.NL; Telegrams: INTAS; Telex: 45888-INTAS NL.*

The Katholieke Universiteit Leuven and the Vrije Universiteit Brussel offer, among others a:
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Information: Institute for Land and Water Management, K.U. Leven, Vital Decosterstraat 102, 3000 Leuven, Belgium. Tel: +32-16-32-97-45; Fax: +32-16-32-97-60; E-mail: iupware@agr.kuleuven, ac.be.
or: Laboratory of Hydrology, V.U. B., Pleinlaan 2, 1050 Brussel, Belgium. Tel: +32-2-629-30-21; Fax: +32-2-629-30-22; E-mail: fdesmedt@vub.ac.be.

International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM) offers a wide range of short- and long-term studies in the field of
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Information: Instituto Agronómico Mediterráneo de Zaragoza; Apartado 202, 50080 Zaragoza, Spain; Tel: (34-76)57-60-13; Fax: (34-76)57-63-77

ITC Postgraduate Diploma and MSc Degree Courses, Enschede, The Netherlands,
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- Rural Land Ecology – Agriculture, Conservation and Environment
- Soil Information Systems
- Planning and Coordination in Natural Resources Mangement
- Environmental Health Using GIS and Remote Sensing.

Information: ITC, Student Registration Office, P.O.Box 6, 7500 AA Enschede, The Netherlands, Tel: +31-(0)53-487-42-05; Fax: +31-(0)53-487-42-38; E-mail: education@itc.nl; Website: http://www.itc.nl/education.

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Information: The Student Recruitment Executive, Silsoe College, Silsoe, Bedford MK45 4DT, U.K.; Tel: (0525) 860428; Fax: (0525) 861527; Telex: 826383 silcam g

External Programme, MSc, PG Diploma and other programmes related to Environment, Biodiversity, Sustainable Agriculture, Rural Change, Applied Economics and Agribusiness and Food Management. Information: External Programme, Imperial College at Wye, **University of London**, Ashford, Kent TN25 5AH, UK (Tel: +44 (0)20 759 42680; Fax: +44 (01233) 812138; email: epadmin@ic.ac.uk)

The University of East Anglia, Norwich, UK, offers a specialist training for development. Tailor-made courses are organized in different fields, e.g.:
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and others
It also offers a 10-week **Short Course on Sustainable Information Systems**.
Information: The Overseas Development Group, University of East Anglia, Norwich NR4 7TJ United Kingdom; Tel: +44-1603-456-410; Fax: +44-1603-505-262; Telex: +51-317210 BUREAU G ODG/UEA; E-mail: odg.train.@uea.ac.uk.

The Wageningen Agricultural University offers an International Postgraduate Programme in different fields, e.g.:
Msc Courses in Agricultural Economics and Management; Agricultural Engineering; Animal Science; Biotechnology; Crop Science, Ecological Agriculture, Environmental Sciences, Soil and Water, Urban Environmental Management etc., as well as a **PhD Programme**.
Information: Ms. Jeanine W.M. Hermans,Dean, Office for International Students, Wageningen Agricultural Unversity, P.O. Box 453, 6700 AL Wageningen, The Netherlands; Tel.: +31-317-483618 or -483433; Fax: +31-317-484464; E-mail: Office@DOIS.SZ.WAU.NL; HTTP://WWW.WAU.NL/; Internet for education and student information: HTTP://WWW.WAU.NL/WAUEDUC.HTML

The Soil Science Department, Faculty of Agriculture, of the Minia University, Minia, Egypt, organizes the following International Courses:
- **International Course on Soil and Plant Analysis** (in cooperation with the Royal Tropical Institute, Amsterdam, The Netherlands;
- **International Training Course for Extension Workers on Soil and Water Problems**;
- **International Training Course on Water Analysis for Agricultural Purposes;**

Information: Prof.Dr. M. A. Kishk, Minia University, Faculty of Agriculture, Service Laboratory for Soil, Plant & Water Analysis, Minia, Egypt. Tel and Fax: +20-86-345-394; Fax: +20-86-322-182.

International Institute for Land Reclamation and Improvement (ILRI)
offers international short courses (1-12 weeks) e.g. on:
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- Land Drainage;
- Land and Water Management
- Computer Applications in Irrigation;
- Microcomputer Applications in Land Drainage;
etc.
Information: *ILRI, Training Coordinator, Lawickse Allee 11, P.O.Box 45, 6700 AA Wageningen, The* Netherlands. Fax: +31-317-495590; E-mail:ilri@ilri.nl

Lincoln University, New Zealand
MSc Course on Resource Management, New Zealand, 2 years.
Information: Lincoln University, International Centre, P.O.Box 94, Canterbury, New Zealand.
Fax: +64-3-3253879; E-mail: wwwic@lincoln.ac.nz.

Cranfield University, United Kingdom
- Msc Course on Land Resource Management, United Kingdom, 1 year.
- Msc Course on Soil Physics and Soil Management, United Kingdom, 3 months.
- Msc Course on Soil Conservation, United Kingdom, 10 weeks
- MSc Course on Land Resource Management, United Kingdom, 1 year.
- Water Management, United Kingdom, 3 months.

Information: Cranfield University, School of Agriculture, Food and Environment, Admissions Office, Silsoe, Bedford MK45 4DT, UK. Fax: +44-1525-863316; E-mail: admissions@cranfield.ac.uk.

CNEARC, France
Techniques d'Irrigation. France, 5 semaines.
Centre National d'Etudes Agronomiques des Régions Chaude (CNEARC), B.P. 5098, F-340033 Montpellier Cedex 01, France.
Fax: +33-467-410232.

CATIE
- Desarrollo rural basado en el manejo de ecosistemas naturales tropicales, Costa Rica,
- Gestión Ambiental. Costa Rica, 2 semanas.

Information: CATIE, Coordinator, Programma de Educación, Apartado 126, Area de Capacitación, Turrialba, Costa Rica. Fax: +506-5561533; E-mail: capacita@computa.catie.ac.cr.

Université des Sciences Agronomiques
Diplôme en Gestion et Développement des Milieux Intertropicaux, Belgique, 1 année.
Information: Université des Sciences Agronomiques, Passage des Déportés 2, B-5030 Gembloux, Belgique.
Fax: +32-81614544; E-mail: boudoin@fsagx.ac.be.

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Master Courses in Applied Environmental Geoscience at the University of Tuebingen, Germany
Information: Dr. C.I. McDermott M.Sc. (AEG Course Administrator) Chair of Applied Geology, Sigwart Str. 10, 72074 Tuebingen, Germany; E-mail: chris.mcdermott@uni-tuebingen.de; Tel: (+49) (0)7071-2978921; Fax: (+49) (0)7071-5059.
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IV Curso Internacional de Postgrado en "Manejo de Suelos Tropicales"
Universitat de Lleida-Centre Tecnologic Forestal de Catalunya, Solsona (Lleida). España. 7 Mayo-1 Junio del 2001
Participantes: Ing. Agrónomos, Ing. Forestales, Biólogos, Geógrafos, Licenciados en Ciencias Ambientales, especialmente de América Latina y España, que esten trabajando o piensen trabajar en la investigación, desarrollo y aplicación de sistemas y prácticas de manejo y conservación de suelos en zonas tropicales y subtropicales.
Profesores: Invitados internacionales con amplia experiencia en diferentes zonas tropicales del mundo.
Información: Secretaría del Curso. Email: Cursosctfc@lisu.lleida.net
Dirección del curso: Prof. Dr. Ildefonso Pla Sentís. Dept. de Medi Ambient i Ciencies del Sol. UdL. Av. Alcalde Rovira Roure, 177. E-25198 Lleida. España; Email: Ipla@macs.udl.es; Fax: +(34)(973)-702613

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Información: Prof. Dr. Ildefonso Pla Sentís. Coordinador del Programa de Doctorado. Dept. de Medi Ambient i Ciències del Sòl. Universitat de Lleida. Av. Alcalde Rovira Roure, 177. E-25198 Lleida. España; Email: Ipla@macs.UdL.es ; Fax: +(34)(973)-702613

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Policies for Soil Fertility Management. A report for the Department for International Development. C. Toulmin and I. Scoones. International Institute for Environment and Development, London, 1999, 128 p. ISBN 1-8-99825-41-X. Softcover.
Improving soil fertility in African farming syystems has become a major issue of concern on the development policy agenda. A number of international initiatives and donor programmes have been established which aim to address the problem of soil fertility decline, and would imply major investment of public funds. This report reviews the evidence used to define the nature of the soil fertility problem in Africa, and examines a series of case studies to identify key factors, which help explain patterns of soil management. It discusses whether there is a case for public intervention to improve soil fertility and assesses the range of stategies available for encouraging more sustainable soil management practices.
Price: GBP 12.50, free to non-OECD. Special offer: this title plus Nutrients on the Move (see below) GBP 18.00.
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Nutrients on the Move. Soil fertility dynamics in African farming systems. T. Hilhorst and F. Muchena, editors. International Institute for Environment and Development, London, 2000, vi + 146 p. ISBN 1-8-99825-56-8. Softcover.
The last decade has witnessed rising concern over the extent to which soils in Africa are becoming degraded and the threat that this poses to agricultural production, livelihoods and the environment. Studies of soil fertility usually present negative nutrient balances at field and farm level, while households have developed a wide range of appropriate management practices. Measures to support better soil husbandry need to consider what is actually happening at farm and field level, how the management of soil fertility varies between different fields, farmers and locations, and the implications of this diversity for design of interventions aimed at improving the management of soil fertility. This book presents case studies of a wide range of soil fertility management strategies, implemented by small-scale farmers in six African countries. They underline the importance of niche management, where certain fields are deliberately nurtured at the expense of others. They also illustrate the dynamics of soil fertility management and analyse the factors affecting incentives to maintain and replenish soil nutrients at farm level. Consideration is given to certain socio-economic and institutional conditions that may either facilitate or hinder good practice, and to the requirements needed to increase the effectiveness of policies and interventions to support farmers.
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Managing Africa's Soils. This series of discussion papers has been launched in 1998 as part of a project entitled Networking on Soil Fertility Management: Improving Soil Fertility in Africa-Nutrient Networks and Stakeholder Perceptions (NUTNET). The project brings together several research programmes working on soil fertility management in Sub-Saharan Africa. Activities include research on farmer management of soil fertility and understanding of the perceptions of different stakeholders towards how best to improve soils management. The series will from now on be continued under the INCO-concerted action programme Enhancing Soil Fertility in Africa: from Field to Policy-maker, which builds on the work done by NUTNET and received funding from the European Union.
For a list of publications, and information about the programme, please contact Mrs. Thea Hilhorst, IIED-Drylands Programme, 4 Hanover Street, Edinburgh EH2 2EN, UK. Fax: +44-131-624-7050. E-mail: thea.hilhorst@iied.org. Homepage: www.iied.org.

Promoting Farmer Innovation. Harnessing local environmental knowledge in East Africa. Workshop Report No. 2. W. Critchley et al., editors. RELMA, Nairobi and UNDP, New York, 1999, xvii + 131 p. ISBN 9966-896-45-7. Softcover.
Successful land husbandry is the key to reversing dryland degradation, attaining food security and promoting sustainable dryland development. The best recipe is to build upon the local knowledge of farmers, pastoralists and other land users. While this is widely recognized and stressed in development circles, there have been few attempts to put this concept into practice. Promoting Farmer Innovation in Rainfed Agriculture (PFI) is the title of an innovative programme developed by the UNDP Office to Combat Desertification (UNSO), which is currently being piloted in Kenya, Uganda and Tanzania. The goal is to harness the energies, ideas and rich experiences of "Farmer Innovators". The Workshop, whose proceedings are given in this publication, held in Dodoma, Tanzania in February 1999, brought together the key partners from the three pilot countries to share experiences and information on progress made in implementing the programme. The book is an introduction to the new approach of harnessing farmer innovation, providing stimulating discussion and serving as a reference on the topic.
Orders to: Regional Land Management Unit, RELMA/Sida, ICRAF House, United Nations Avenue, Gigiri, P.O. Box 63403, Nairobi, Kenya. Fax: + 254-2-520762. E-mail: relma@cgiar.org. Homepage: www.relma.org.

Groundtruthing. New perspectives on soil erosion and conservation in the Tropics. W.R.S. Critchley. Thesis, Vrije Universiteit, Amsterdam, 2000, vii + 199 p. Softcover.
Groundtruthing literally means to verify, through ground level study, what is unclear or ambiguous when seen from the air. In this thesis the term is used

metaphorically to portray investigations, on the ground, which aim to develop new perspectives on soil erosion and conservation in the tropics. The author has been involved in research and development aspects of natural resource management for over 25 years, mainly in Africa and Asia. The point of departure for the research reported in this thesis is the change that has come about in the thinking about land degradation, erosion and conservation in the developing tropics over the last twenty-five years. The research sought to: (1) investigate the technical and development potential for building on traditions of soil and water conservation (SWC); (2) develop innovative methodologies for monitoring erosion under SWC structures; (3) review and analyse the impact of terraces in tropical steeplands; and (4) offer recommendations for future development and associated research in these fields. The thesis is composed of an introduction, six self-standing papers on research carried out in Africa and Indonesia, an overview and synthesis section on terracing in Asia and Africa, and a summary.
Requests to: Dr. W.R.S. Critchley, CDCS/International Cooperation Centre, Resource Development Unit, Vrije Universiteit, De Boelelaan 1115, 1081 HV Amsterdam, The Netherlands. Fax: +31-20-444-9095. E-mail: wrs.critchley@dienst.vu.nl.

Land Resources Information Systems for Food Security in SADC Countries. World Soil Resources Reports 89. FAO, Rome, 2000, vi + 78 p. ISBN 92-5-104427-9. ISSN 0532-0488. Softcover.
This publication forms the proceedings of a subregional workshop, held in Harare in November 1999. The purpose of the meeting was to promote land resources information systems and their application in the assessment, mapping and monitoring of land in relation to food security in the Southern African region. After a summary report of the meeting and the recommendations, the publication contains a number of technical papers about relevant land resources information systems, reviews of advances made in the field both within the region and outside. A plan of action was made to promote future reporting and exchange of information, data expertise and experiences in land information in the region. An inventory of the state of land, water and plant nutrient resources in the region is of great importance in view of food security.
Price: USD 12.00.
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Land Resource Potential and Constraints at Regional and Country Levels. World Soil Resources Reports 90. A.J. Bot, F.O. Nachtergaele and A. Young. FAO, Rome, 2000, viii + 114 p. ISBN 92-5-104429-5. ISSN 0532-0488. Softcover.
It is well known that for many years FAO has been building up information about the world's land resources. At an early stage it was realized that in order to evaluate land potential, data on soils and landforms must be combined with the analysis of climate. Estimates of land degradation, and the potential arable land, have been added to the range of needed information. In recent years, great advances have been made through the application of electronic data processing, GIS, and modelling. The survey, analysis and evaluation of land resources information are ongoing tasks. The purpose of this publication is to provide a worldwide overview at country level of the physical resource data presently available. Specific objectives are: (1) to indicate the relative extent of physical resource limitations to agriculture and other forms of land use; (2) to highlight areas which call for the treatment or management of specific land resource constraints, so that regional and national action plans can be better focused on specific problems; and (3) to indicate the limitations of the data, and hence the priority needs for improved information. The coverage is worldwide and, in all, 160 countries are evaluated, omitting very small countries for reasons of data unreliability at a world scale.
In addition tot the analysis of specific kinds of data, some correlations are made between physical resource constraints, land degradation, and population, to explore the extent to which intuitive relationships are confirmed. Although the results must be treated as first approximations, this is a highly important land resources database. It is stressed that there is an urgent need to improve the reliability of the data, through more detailed studies by national resource survey organisations.
Price: USD 14.00.
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Land Cover Classification System – LCCS. Classification Concepts and User Manual. A. Di Gregorio and L.J.M. Jansen. FAO, Rome, 2000, xi + 179 p. ISBN 92-5-104216-0. Softcover. With CD-ROM.
This publication presents a new concept of land cover classification, which uses a set of independent diagnostic criteria, the so-called classifiers, rather than being nomenclature based. This approach allows correlation with existing classifications and legends, so this system could serve as an international reference base for land cover. The methodology is applicable at any scale and is comprehensive in the sense that any land cover identified anywhere in the world can be readily accommodated. The rearrangement of the land cover classes, based on regrouping of the used classifiers, facilitates the extensive use of the outputs by a wide variety of end-users.
The Land Cover Classification System (LCCS) has been designed with two main phases: an initial dichotomous phase, in which eight major land cover types are defined, followed by a subsequent modular-hierarchical phase, in which land cover classes are created by the combination of sets of predefined classifiers tailored to each major land cover type in order to use the most appropriate classifiers and to reduce the likelihood of impractical combinations of classifiers. A software program has been developed to assist in land cover interpretation, thus standardizing this process and contributing to its consistency. The software contains four modules, comprising classification, legend, storage of field data and translation/correlation of classes at the class level or at the level of the classifiers. It also contains a glossary with definitions of all terms used.
Price: USD 50.00
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Land and Water Resources Information Systems. FAO Land and Water Bulletin 7. FAO, Rome, 1998, viii + 38 p. ISBN 92-5-104199-7. ISSN 1024-6703. Softcover. With CD-ROM.
This publication contains the outcome of a consultation held under the same title at FAO, Rome, in December 1997. The consultation was held in the context of the preparation of a project on Information and Decision-support Systems on Integrated Land and Water Resources Management. One of the objectives was to take note of the state of the art in technologies related to natural resources information systems. Another objective was to initiate development of a partnership framework for collaboration and networking in methodology development and exchange of information on land and water. This Bulletin contains the outcome of the meeting in the form of an extended summary report, in which also attention is given to a possible FAO collaboration with national and international institutions in view of global, regional and national land and water databases. The CD-ROM contains the texts of the presented papers.
Price: USD 48.00.
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Manual on Integrated Soil Management and Conservation Practices. FAO Land and Water Bulletin 8. International Institute of Tropical Agriculture, Ibadan, and FAO, Rome. FAO, Rome, 2000, xiii + 214 p. ISBN 92-5-104417-1. ISSN 1024-6703. Softcover.
Soil resources depletion is a widespread, direct threat to the sustainability of agricultural production. Dramatic changes in soil management concepts are needed to counter this threat. This manual proposes options for such changes, addressing a broad variety of topics related to agricultural land management, ranging from chemical and physical attributes of soils, soil management concepts, mechanization and tillage, mulching and green manure, erosion control and water management, to concepts of participative transfer of technologies. Traditional soil management concepts are analysed and suggestions made to consider more sustainable alternatives for a conservation-effective agriculture. This manual is based on a training course, given in 1997, entitled Soil Management and Conservation – Efficient Tillage Methods for Soil Conservation. The publication serves as a practical guide that will allow technicians and farmers to jointly discover ways to solve the problems and the limitations posed by land degradation, especially in Latin America and Africa. This Bulletin is also available in Spanish.
Price: USD 20.00.
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New Concepts and Approaches to Land Management in the Tropics with Emphasis on Steeplands. FAO Soils Bulletin 75. F. Shaxson. FAO, Rome, 1999, viii + 125 p. ISBN 92-5-104319-1. ISSN 0253-2050. Softcover.
In the tropics most of the steepland areas are settled by small farmers, where livelihoods may be endangered by land degradation and associated loss of agricultural productivity. There is a growing awareness that sustainability of subsistence agriculture on steeplands is steadily deteriorating as a result of rapid population growth and the overexploitation of the land resource base. Given the various limitations affecting steeplands agriculture, few soil management and conservation options remain. This Bulletin brings concepts and principles of good land husbandry into focus, as a basis for developing different ways of thinking about safe management of steeplands within the environmental, cultural and economic context of the farm families that inhabit them. The translation of the concepts and principles of good land husbandry into field practice will require practical actions that are well adjusted to the site and farmer-specific conditions where they would be applied. This publication is well illustrated with tables and photographs, mostly in colour.
Price: USD 45.00.
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Land and Crop Management in the Hilly Terrains of Central America. Lessons learned and farmer-to-farmer transfer of technologies. FAO Soils Bulletin 76. R. Barber. FAO, Rome, 1999, vii + 76 p. ISBN 92-5-104318-3. ISSN 0253-2050. Softcover.
Farmers are constantly being subjected to changes that are beyond their control on account of factors that affect the viability and profitability of their farming enterprises. Therefore, farmers must acquire the capacity to respond to these changing situations and opportunities in order to maximise production. Farmers need to be helped to develop this capability by encouraging their innovations and by involving them in a learning process in which they are exposed to new knowledge and technologies. The present Bulletin is meant as a guideline for those involved in the promotion, planning and implementation of sound agricultural development initiatives in hilly areas. Because of the limited capacity in some government and non-governmental organisations to promote agriculture at an adequate rate, emphasis has been placed on training farmers to act as extensionists and innovators. The main recommendations relate to basic principles of improved crop and land management such as simplified diagnostic procedures, adequate extension and training participatory approaches, adapted and widely-adopted low-cost simple farming activities engendering farmers' motivation and self-esteem, credit and market facilities, and simple qualitative methods of evaluating project impact carried out by farmers themselves.
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Solute Movement in the Rhizosphere. P.B. Tinker and P.H. Nye. Oxford University Press, New York and Oxford, 2000, xix + 444 p. ISBN 0-19-512492-8. Hardcover.
In this book, the authors describe in detail how plant nutrients and other solutes move in the soil in response

to plant uptake and leaching. The plants considered may grow in isolation, or as a crop, mixture of crops, or as a natural community. The way their roots interact with the soil is not so fully understood as the way their roots respond to the atmosphere, because the root-soil system is both complex and too inaccessible to study easily. It is the aim of the authors to understand processes in the rhizosphere so fully that they can model them realistically, and predict the effects of variations in natural conditions.

The book retains the general approach of the authors' "Solute Movement in the Soil-Root System", published in 1977. It takes into account new research findings and has been largely rewritten and expanded, mostly concerning the rhizosphere. Chapter 1 outlines the history of ideas on the subject and concludes with a simple account of the continuity, or mass-balance, equation, which underlies most quantitative treatments of transport. Chapter 2 deals with water movement and uptake by plants in sufficient depth to show how it should be introduced into models of solute movement. Chapter 3 describes how solutes are distributed between the solid, liquid and gas phases of the soil. Chapter 4 describes local solute movements, particularly by diffusion. Chapter 5 concentrates on plant roots, the uptake rate of solutes and much new information about the molecular and cell processes involved. Chapter 6 examines the solute movements occurring in the soil around a single root of an intact plant due to its uptake of water and solutes. Chapter 7 deals with solubilization of sparingly soluble nutrients in the rhizosphere. Chapter 8 contains a much-expanded treatment of mycorrhizas and rhizosphere microorganisms in relation to nutrient uptake. Chapter 9 considers carbon allocation to roots and rhizosphere in understanding plant and root growth. Chapter 10 describes the modelling of the growth and nutrient uptake of a single whole plant in homogeneous soil, including the interactions within the root zone caused by competition for nutrients between individual roots. Chapter 11 confronts the complexities of modelling the growth and nutrient uptake of crops and mixtures of plants in the field. The list of references is very extensive with about 1300 publications, many of which are recent.

Price: USD 95.00.

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SOILpak for Cotton Growers. Third edition. D.C. McKenzie, editor. NSW Agriculture, 1998, 352 p., ringbound, plus Pocket notes p. 33. ISBN 0-7310-9849-8. Price: AUD 80.00, plus postage.

SOILpak for dryland farmers on the red soil of Central Western NSW. A.N. Anderson, D.C. McKenzie and J.F. Friend. NSW Agriculture, 1999, 369 p., ringbound. ISBN 0-7313-1525-1. Price: AUD 25.00, plus postage.

Because these books are similar in style and format, they are reviewed together. They are written as guides to best practice soil management in a specific area and on specific soils. However, they are much more than that. Each presents the skills of soil examination and evaluation in a comprehensive and attractive package. Although intended for growers, extension officers and consultants in New South Wales, Australia, they are such excellent examples of a manual describing the principles and techniques of soil assessment in the field, they will be of considerable value to those dealing with soil management in other areas and on other soils. The manuals are based on an accumulation of many years of research and of experience gained in the field by numerous soil scientists, agronomists and by growers themselves. The style is clear and easy to follow. Each chapter begins with a description of its purpose and an overview. After part A, an Introduction, part B is entitled Quick Help, which includes a trouble-shooting guide. In both manuals, part C contains the main meat – diagnosing soil condition. It begins with why, where, when and how to dig an inspection pit. Guidance is given on the evaluation of surface features, soil suitability for root growth and water intake, profile tests including slaking and aggregate dispersion. Special attention is given to the assessment of soil structure, based on a systematic and detailed scoring procedure. The scores are then used to evaluate various management options related to the severity of the compaction found. Part D offers practical soil management after the diagnosis of soil conditions. Part E gives background scientific information on compaction processes, hardsetting and crusting, sodicity, salinity, clay minerals, water movement and organic matter. The text is well supported with good sketches and diagrams. There are almost 400 references.

The approach is thoroughly practical and the techniques described are well backed by sound research. With little modification the methods could be used on other soils and for other crops. The manual is strongly recommended to all those with an interest in the field evaluation of soils. The manual is a good example of putting soil science into practice, in an attractive and readily understood package.

Prices: see after the titles.

Orders to: Information Delivery Unit, NSW Agriculture, Locked Bag 21, Orange NSW 2800, Australia. E-mail: bookshop@agric.nsw.gov.au.

T. Batey, UK.

Humic Substances. Versatile Components of Plants, Soils and Water. E.A. Ghabbour and G. Davies, editors. Royal Society of Chemistry, Cambridge, 2000, v + 341 p. RSC Special Publication No. 259. ISBN 0-85404-855-3. Hardcover.

This book is a companion of the volumes "Humic Substances: Structures, Properties and Uses" and " Understanding Humic Substances: Advanced Methods, Properties and Applications", published by the Royal Society of Chemistry in 1998 and 1999, respectively. The present volume is based on the proceedings of the Fourth Humic Substances Seminar, held in March 2000 in Boston. The three volumes report about research on Humic Substances (HSs), the remarkable brown bio-

materials in animals, coals, plants, sediments, soils and waters. HSs functions include water retention, pH buffering, photochemistry, redox catalysis, solute sorption and metal binding. Because biomaterials are of vital importance to the productivity, health and safety of the world's land and water, humic substances are increasingly in the scientific spotlight. However, their structures responsible for this range of natural functions still need to be understood. Real progress is being made thanks to more and more discriminating analytical and physical measurements on reproducible HSs samples. This book, with its molecular approach, brings the reader right up to date with current research; the key features being advanced analytical methods and physical measurements. Spectroscopic and mass based approaches, in particular quantitative NMR, are discussed in detail, as a means of attempting to understand the structures of these complex substances. Chromatographic techniques, including fluorescent fractionation, are also described. The use of coal based humic substances for soil enhancement, water purification and soil remediation as an alternative to present methods is explored. This book and its companion volumes will have a broad appeal to researchers in many disciplines, including agricultural and environmental sciences.
Price: GBP 79.50.
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Understanding Humic Substances. Advanced Methods, Properties and Applications. E.A. Ghabbour and G. Davies, editors. Royal Society of Chemistry, Cambridge, 1999, xv + 286 p. RSC Special Publication No. 247. ISBN 0-85404-799-9. Hardcover.
This book complements the volume Humic Substances: Structures, Properties and Uses, and the volume mentioned above, both published by the Royal Society of Chemistry. Humic substances are highly functionalized, carbon-rich molecules with a strong tendency to aggregate. This helps HSs to hide their identities as macromolecules or self-assembling systems. HSs are chameleons that can behave like lipids, polysaccharides or proteins depending on the circumstances. We need to know HSs' molecular structures in order to understand their properties. The importance of HSs in the environment and human health is encouraging the best minds with the best tools in a concerted effort to solve one of nature's greatest mysteries. Although many questions related to HSs have been answered, many fundamental questions remain. The present book is derived from Humic Substances Seminar III, which was held in Boston in March 1999. It contains 23 contributions, starting with an interesting overview of 40 years of humic acid research. It is followed by articles about the use of sophisticated tools and methods, focusing on the use of chemical and physical methodologies to seek an explanation of the structures and their relation to micro- and microscopic properties. Covering aspects of the biology, chemistry, physics and physiology of HSs, this book encompasses topics such as fluorescence, laser spectroscopy, senescence and the latest in NMR.
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Fundamentals of Environmental Chemistry, Second edition. S.E. Manahan. Lewis Publishers, Boca Raton, London, 2001, xvi + 1006 p. ISBN 1-56670-491-X. Hardcover.
This book is written with two major objectives in mind. The first is to provide a reader having little or no background in chemistry with the fundamentals of chemistry needed for a trade, profession, or curriculum of study that requires a basic knowledge of these topics. The second objective is to provide a basic coverage of modern environmental chemistry. This is done within a framework of industrial ecology and an emerging approach to chemistry that has come to be known as "green chemistry" - the practice of chemistry that minimizes the use of raw materials and producing little or no waste.
This book gives the reader a basic coverage in the following subjects: matter and the basis of its physical nature and behavior; organic and biological chemistry; chemistry of water, air and soil; industrial chemistry; toxicological chemistry as it pertains to occupational health and human exposure to pollutants and toxicants; energy, nuclear energy, and nuclear waste; environmental and xenobiotics analysis for monitoring pollutants and toxic substances in the environment and living organisms.
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Environmental Restoration of Metals-Contaminated Soils. I.K. Iskander, editor. Lewis Publishers, Boca Raton, London, 2001, vii + 304 p. ISBN 0-56670-457-X. Hardcover.
During the last decades, phenomenal progress has been made in several areas of biology, ecology, health, and environmental geochemistry of heavy metals in soils. Prior to the 1960s, research was focused on enhancing the plant uptake or availability of selected heavy metals or minor elements from the soil. More recently, concerns regarding heavy metals contamination in their environment affecting all ecosystem components, including aquatic and terrestrial systems, have been identified with increasing efforts on limiting their bioavailability in the vadose zone. Many sites have been identified as hazardous waste sites because of the presence of elevated concentrations of heavy metals. Unlike organic contaminants that can be destroyed through treatment technologies, metal contaminants cannot. They will remain a threat to the environment until they are removed or immobilized. Because of the concerns regarding the role of heavy metals in the environment, a series of conferences was held to explore the emerging issues of the biogeochemistry of trace elements in the environment.

In June 1997, the Fourth International Conference on the Biogeochemistry of Trace Elements was held in Berkeley. The contributions in this book were presented at this conference. The book has 14 chapters, the first eight deal with the physical and chemical methods and processes for soil remediation, the other six focus on selected biological methods and processes for remediation.
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Moving Methodologies. Learning about integrated soil fertility management in sub-Saharan Africa. T. Defoer. Ph.D. thesis, Wageningen University, 2000, ix + 188 p. ISBN 90-5808-319-5. Softcover.
Soil fertility management in sub-Saharan Africa is complex, diverse and dynamic. Farmers' investments are determined by a large variety of factors, including biophysical characteristics of the environment, access to resources and the institutional and socio-economic context of farming and livelihood making. Within this context, defining soil fertility problems in general terms is not meaningful and proposing a limited number of standard interventions, aimed at the 'average' farmer is of limited value. Site-specific answers are needed, taking into account the site specificity of the problems. Moreover, to increase their effectiveness, improved technologies and practices are to be combined in an integrated way, which necessarily has to take place at the farm level. To do this, farmers have to be closely involved in developing, adapting and fine-tuning improvements in order to make use of their practical knowledge of successfully managing soil fertility. To make this happen, farmers have to be involved in practical learning processes, which are to become the driving force of agricultural development. This thesis comprises two volumes. For an announcement of the first volume, entitled Managing soil fertility in the tropics, see the end of this review. The present book is volume 2, and contains an introduction and four chapters. Chapter 2 provides a description of the research methodologies used. Chapter 3 describes the methodology development process through the analyses of case studies in Kenya and Mali. The fourth chapter deals with an impact assessment of participatory action research conducted in a pilot research site, where the methodology development process started. Chapter 5 presents a discussion and the conclusions of the thesis. See also the announcement about Managing Soil Fertility in the Tropics, edited by T. Defoer and A. Budelman, and published by KIT Press, Amsterdam, in IUSS Bulletin 98, page 134.
Requests to: Dr. T. Defoer, Mas de Duges, F-82160 Caylus, France. E-mail: tdefoer@wanadoo.fr.
See also the homepage of KIT Press, Amsterdam: www.kit.nl/books.

Food, Water and War. Security in a World of Conflict. Crawford Fund 2000. ACIAR Monograph No. 73. Australian Centre for International Agricultural Research (ACIAR), Canberra, 2000, 114 p. ISBN 0-64245-023-4. Softcover.
This is the record of a conference conducted by the Crawford Fund for International Agricultural Research on 15 August 2000 in Canberra. In the preface, the Chairman of the Crawford Fund's Board of Management, the Hon. Tim Fischer, states that agriculture, food, and access to natural resources like water, play key roles in development for poor nations and in avoiding conflicts. According to former US President Jimmy Carter there can be no peace in the world while people are poor and hungry. Helping the agricultural sector to grow is essential to human destiny in the 21st century. This will involve increased support for national and international agricultural research, to feed the world's growing population. This publication contains the papers presented at the conference by Australian politicians and by scientists from Australia and elsewhere, and covers a wide range of relevant issues.
Requests to: Communications Coordinator, ACIAR, GPO Box 1571, Canberra, ACT 2601, Australia. Fax: +61-6-2170501. E-mail: aciar@aciar.gov.au. Homepage: aciar.gov.au.

Vadose Zone. Science and Technology Solutions. B.B. Looney and R.W. Falta, editors. Battelle Press, Columbus and Richland, 2000. Volume 1: xxxix + 589 p. Volume 2: xiv + pp 590-1540. ISBN 1-57477-085-3. Hardcover. With CD-ROM.
This two-volume publication constitutes a comprehensive reference on characterizing and modeling vadose zone systems and the behavior and cleanup of vadose zone contamination. It documents the state-of-the-art in vadose science in a practical and useful manner, presenting technical and scientific issues, challenges, and practical strategies. Throughout the book and on its companion CD, over 130 case studies illustrate the scientific issues. Under the editorial direction, this book is a culmination of over two years' work, including three workshops, with input, suggestions and contributions from over one hundred scientists and engineers. It describes all aspects of comprehensive vadose zone program development, including basic hydrogeology, characterization, and contaminant behavior. The book (1) introduces and defines the vadose zone and its contamination, including a detailed discussion of the physical and chemical processes; (2) discusses the components needed to formulate a cost-effective and responsible "comprehensive vadose zone program"; (3) describes baseline and state-of-the-art vadose zone characterization methods, including tensiometers and samplers and surface and borehole geophysics; (4) describes the fate and transport of vadose zone contaminants, including discussions of chemistry, geology and modeling; (5) documents the state-of-the-art for containment and remediation of vadose zone contaminants. In all chapters gaps in current understanding and various solutions of suggestions for filling these gaps are given. The case studies provide practical field data on specific scientific issues. They address specific tech-

niques as well as overall chapter topics. The case studies in the book and on the CD address also sites where characterization, monitoring, modeling, and cleanup have been integrated. The book is well illustrated with many figures and tables; all chapters have extensive lists of references.
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Orders to: Battelle Press, 505 King Avenue, Columbus, OH 43201-2693, USA. Fax: +1-614-424-3819. E-mail: press@battelle.org. Homepage: www.battelle.org/bookstore.

The Method of Response Function in Ecology. Advances in Ecological Sciences, volume 7. Y.A. Pykh and I.G. Malkina-Pykh. WIT Press, Southampton, 2000, 288 p., plus CD-ROM. ISBN 1-85312-662-4.
This volume presents a new approach to the construction of ecological models based on a generalized version of the response function method. Using this, all essential features of ecosystem processes, such as complexity, unknown mechanisms, multidimensionality, uncertainty, and irreducibility, can be taken into account. The authors apply the method to a variety of environmental problems and a CD-ROM containing demonstration versions of four models discussed is included. The book has the following contents: Fundamentals of the theory of response function method; ONTOMOD – the model of ontogenesis in higher plants using soybean as an example; POLMOD.RAD – the model of 90Sr dynamics in elementary ecosystems; POLMOD.PEST – the model of pesticides' dynamics in elementary ecosystems; HUMOD – the model of humus formation in soils of natural and agricultural ecosystems; and the development of environmental indices using the method of response function.
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World Food Prospects: Critical Issues for the Early Twenty-first Century. 2020 Vision Food Policy Report P. Pinstrup-Andersen, R. Pandya-Lorch and M.W. Rosegrant. International Food Policy Research Institute, Washington, 1999, 32 p. Downloaded from IFPRI homepage.
Almost all of the increased demand for food between 1995 and 2020 will take place in the developing world, according to a new IFPRI food policy report. In developing countries during that period, population is expected to grow by 32 percent, urbanization will continue apace, and per capita incomes will increase. Despite these changes, in 2020 a developing-country person will consume less than half the amount of cereals consumed by a developed-country person and slightly more than one-third of the meat products. This report examines trends in world food demand, supply, and trade. Unless strong action is taken, food insecurity and malnutrition will persist in 2020 and beyond. The report also discusses six critical issues that could influence the future world food situation. From the agricultural side, the authors believe that new farming and agricultural research practices may help small farmers in developing countries be more productive in the future.
This report and related ones, can be downloaded from: www.cgiar.org/ifpri/pubs/pubs.htm#fpr.

A Course in Mathematical and Statistical Ecology. Theory and Decisions Library, series B, Mathematical and Statistical Methods, volume 42. A. Gore and S. Paranjpe. Kluwer Academic Publishers, Dordrecht, Boston, 2001, xi + 286 p. ISBN 0-7923-6715-4. Hardcover.
As the world enters the new millennium, mankind faces a series of new problems, many of them created by man himself. These include overpopulation, air and water pollution, global warming, accumulation of greenhouse gases, damage to the ozone layer and loss of biodiversity. One of the consequences is an enhanced interest in sciences connected with these problems. Ecology is a field that is useful in understanding many of these problems. The primary audience of this book is graduate or senior undergraduate students in mathematics and statistics. They will be able to see how basic tools in their disciplines can be employed to elucidate seemingly intricate issues in ecology. Ecological aspects are discussed just enough to motivate the particular quantitative technique. The book touches upon all major areas in the field of ecology. Beginning with classical mathematical models for population dynamics and their use in population management and harvesting, it covers the traditional as well as the most recent nonstandard methods of abundance estimation. The study of biodiversity is discussed at length. The last chapter is on models for animal and plant behaviour.
Price: EUR 127.00, USD 138.00, GBP 87.00.
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Linking Climate Change to Land Surface Change. Advances in Global Research, volume 6. S.J. McLaren and D.R. Kniveton, editors. Kluwer Academic Publishers, Dordrecht, Boston, 2000, xii + 264 p. ISBN 0-7923-6638-7. Hardcover.
The relationships that exist between changes in climate and land surface change are topical issues, but research and collaboration between researchers from the different disciplines of climatology, geomorphology and Quaternary sciences, is often hampered by the different approaches; the incompatibility of scales of involvement (both spatial and temporal) of the various models used; and by differences of interest in such topics as mean values for climatic parameters and the probabilities of extreme events. In terms of approaches there are those researchers who have tried to model past, present and future climatic changes, and there are people who have used proxy data (such as sediments and landforms) to reconstruct past climates. Only relatively recently have attempts been made to integrate the two distinct approaches. To understand how climate is likely to change in the future, it is necessary to have an

understanding of how climate has changed in the past in order to identify any underlying trends in natural climatic change. Many of the studies that use proxies to make interpretations of past environmental conditions from landforms and other land surface features, as well as the small scale recent process-based research all need to be placed in a larger framework to aid our understanding of global climatic change. Palaeo-reconstructions are needed to provide evidence of past changes, to help in the comprehension of the responses of terrestrial surfaces and to help validate predictive models of climatic change. Present day studies rely on the processes of observation, measurement, as well as modelling.
This book gives a selection of papers on the relationship between climatic change and land surface change and of the different approaches that have been undertaken to address the many issues involved. It highlights the importance of multidisciplinary research over different timescales and from the scale of local catchment studies to global processes. Recent advances in techniques such as absolute dating, geochemical analyses, remote sensing and climate modelling have aided these studies.
Price: NLG 220.00, USD 110.00, GBP 69.00.
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Rainfed Lowland Rice: Advances in Nutrient Management Research. J.K. Ladha, L. Wade, A. Dobermann, W. Reichardt, G.J.D. Kirk and C. Piggin, editors. International Rice Research Institute, Los Baños, 1999, 304 p. ISBN 971-22-0117-1. Softcover.
Rainfed lowland rice presents a series of unique challenges for nutrient research. It is important to understand water and nutrient dynamics/balances and uptake and use efficiency to obtain plant responses for sustainable increases in productivity. But much of the research on resource management that is strategic in nature can only be done at selected sites because of the inherent heterogeneity of the rainfed lowland ecosystem. The Rainfed Lowland Rice Research Consortium, together with the Ubon Rice Research Centre , Thailand, organized a workshop in October 1998 to discuss these issues. The objectives included an appraisal of studies relating to nutrients in rainfed lowland rice, and consideration of future research issues and opportunities for collaboration. This publication contains the papers presented at the symposium, and the recommendations emerging from the group discussions. It should be a useful source of information on nutrients in rainfed lowland rice culture.
Price: HDC UDC 30.80, LDC USD 8.00, plus postage and handling.
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The Quest for Nitrogen Fixation in Rice. J.K. Ladha and P.M. Reddy, editors. International Rice Research Institute, Los Baños, 2000, 353 p. ISBN 971-22-0112-7. Softcover.
Nitrogen is the most important nutrient required for rice production. A major goal of biological nitrogen fixation (BNF) research has been to extend the nitrogen-fixing capacity of cereal plants such as rice. If a BNF system could be assembled in the rice plant, it would increase the potential for nitrogen supply because fixed nitrogen would be available to the plant directly with little or no loss. To achieve nitrogen fixation in rice, IRRI launched a global collaborative initiative in 1993 consisting of scientists with diverse backgrounds and approaches and committed to reducing the dependency of rice on mineral nitrogen resources. In 1999, the third BNF workshop took place, during which significant results were reported. This book features the proceedings of that meeting and encompasses the latest research advances in the attempt to develop nitrogen-fixing rice.
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Carbon and Nitrogen Dynamics in Flooded Soils. G.J.D. Kirk and D.C. Olk, editors. International Rice Research Institute, Los Baños, 2000, 188 p. ISBN 971-22-0140-6. Softcover.
Recent interest in the key function of flooded soils in carbon and nitrogen cycling and the supply of mineral nitrogen to the rice crop has been stimulated by trends in declining productivity in intensive rice systems. These systems will undergo large changes over the next decades. They must produce, on average, 30% more rice; they must do so with less water; and they will undergo some degree of mechanization and diversification into rice-nonrice rotations. To manage these changes, we need to understand their consequences for soil processes, particularly the soil's key function in soil carbon and nitrogen dynamics. Most of our understanding of these dynamics has been gained from research on aerobic soils in temperate regions and relatively little has been done on flooded anaerobic soils under tropical conditions. The declining productivity was linked to long-term changes in soil organic matter content and the supply of nutrients. Furthermore, there is a concern about the relations between organic matter and the release of greenhouse gases; crop residue management; the fate of pollutants; water relations and crop establishment; and soil physical conditions in rice-nonrice systems. To discuss these issues, IRRI organized a workshop on carbon and nitrogen dynamics in April 1999, and this book features the papers presented. The last chapter contains the gist of the discussions and a listing of the anticipated changes and research needs.
Price: HDC USD 18.20, LDC USD 4.75, plus postage and handling.
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Systems Research for Optimizing Future Land Use in South and Southeast Asia. SysNet Research Paper Series No. 2 (2000). R.P. Roetter, H. Van Keulen, A.G. Laborte, C.T. Hoanh and H.H. Van Laar, editors. IRRI, Los Baños, 2000, xiii + 266 p. ISBN 971-22-0143-0. Softcover.
This publication contains the proceedings of the Inter-

national Symposium SysNet'99: Systems Research for Optimizing Future Land Use, held at IRRI in October 1999. One of the central issues at this symposium is the competition between agriculture for land use to produce food and alternative uses of land, which is growing at an alarming rate, especially in South and Southeast Asia. It is estimated that the demand for rice in this region will grow with 40-50 % in 25 years. With such pressure, marginal lands are forced into cultivation and species habitats are destroyed, causing a cycle of destruction of Earth's resources and a worsening of the lives of those who are already poor. Under this scenario, the primary effort should be to design production systems and technologies that optimize the efficiency of inputs to the environment and minimize emissions and losses from the environment. The approach of matching the quality of the natural resources with the various societal demands placed on them is the realm of the scientific field of land use systems analysis. It is founded on the principles of production ecology, which integrates the knowledge of basic physical, chemical, physiological and ecological processes in agro-ecosystems and uses that to understand their functioning. The Systems Research Network for Ecoregional Land Use Planning in Tropical Asia (SysNet) is developing and applying such tools. The present publication contains papers on the development of the systems methodologies for land use planning as well as on eight case studies in the region. About half of the book is devoted to papers about decision support systems components in LUPAS (Land Use Planning and Analysis System), other decision support systems, short notes, and conclusions and prospects.
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Synthesis of Methodology Development and Case Studies. SysNet Research Paper Series No. 3 (2000). R.P. Roetter, H. Van Keulen and H.H. Van Laar, editors. IRRI, Los Baños, 2000, xii + 94 p. ISBN 971-22-0150-3. Softcover.
The Systems Research Network for Ecoregional Land Use Planning in Tropical Asia (SysNet) was established to develop methodologies for determining land use options and to evaluate these methodologies for generating options for policy and technical changes in selected areas. SysNet is coordinated by IRRI, the participants are national agricultural research partner institutions in India, Malaysia, Philippines, and four collaborating institutions belonging to the Wageningen University and Research Centre, The Netherlands.
This publication contains the executive summary, the project's overview and its highlights between 1996 and 1999, and the progress between November 1999 and June 2000. The most recent scenario analyses for the four case study regions in the countries mentioned above are given. Special attention is given to the development and description of the user interface and interaction with the stakeholders in the case study areas. The volume concludes with a brief outline of the challenges ahead.
A CD-ROM, not contained in this publication, contains all the tools developed within the project period.
For information about the project: Dr. R.P. Roetter, Alterra, P.O. Box 47, 6700 AA Wageningen, The Netherlands. E-mail: R.P.Roetter@alterra.wag-ur.nl. Homepage of SysNet: www.cgiar.org/irri/sysnet.
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Geostatistics for Environmental Scientists. R. Webster and M.A. Oliver. John Wiley & Sons, Chichester, New York, 2001, xi + 271 p. ISBN 0-471-96553-7. Hardcover.
This book is published in the series Statistics in Practice, edited by V. Barnett. It is a series of texts, which provide detailed coverage of statistical concepts, methods and worked case studies in specific fields of investigation and study. The present book is a completely rewritten successor to the book Statistical Methods in Soil and Land Resource Surveys, written by the same authors and published in 1990. Most of the material that has been included in this new book is straightforward linear geostatistics using least-squares estimation. The theory and techniques have been around in mineral exploration and petroleum engineering for some three decades. For most of that time environmental scientists could not see the merits of the subject or appreciate how to apply it to their own problems, because of the context, the jargon and the mathematical presentation of the subject by many authors. This has changed in the last few years as soil scientists, hydrologists, ecologists, geographers and environmental engineers see that the technology is for them, if only they knew how to apply it. The authors have tried to satisfy that need.
The book starts with sampling, followed by data screening, summary and display. It considers some of the empirical methods that have been used for mapping, and then it introduces the theory of random processes, spatial covariances, and the variogram, which is central to practical geostatistics. Practicioners will learn how to estimate the variogram, what models they may use legitimately to describe it mathematically, and how to fit them. There is a brief excursion into the frequency domain to show the equivalence of covariance and spectral analysis. The book then returns to the principal reason for geostatistics, local estimation by kriging. Coregionalization is introduced as a means of improving estimates of a primary variable when data on one or more other variables are to hand or can be readily obtained, and the final chapter introduces disjunctive kriging, a non-linear method of prediction for decision-making.
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Ecological Risk Evaluation of Polluted Soils. J.-L. Rivière. A.A. Balkema, Rotterdam, Brookfield, 2000, xii + 223 p. ISBN 90-5410-796-0. Hardcover.

This book is a translation of Évaluation du risque écologique des sols polués, published in 1998 by Technique & Documentation, Paris.

The subject of the evaluation of the ecological risk posed by pollutants is vast and complex. Our understanding of natural ecosystems is still very imperfect, and prediction is by nature an uncertain operation, but a look at the scientific literature shows that research is very active, and that methods and techniques are rapidly evolving. This book is an introduction in which the reader will find the fundamental principles, as they are conceived at present, and a range of workable methods. In chapter 1 the general principles of the evaluation of ecotoxic risk, comprising health risk and ecological risk, are presented. Strategies for the evaluation of ecological risk aim to define as completely as possible the potential or inconspicuous effects of pollutants on the environment, and the chief objective of the evaluation will be to designate the elements at risk, in close interaction with decision makers, those responsible for polluted sites, the public, and others. The initial stage of risk formulation is elaborated in chapter 5, with the final stage risk management. Once the elements at risk are identified, the existing scientific data can be used to work toward evaluating the modalities and extent of contact between the soil at risk and the pollutant (chapter 2), in parallel with an evaluation of the relation between the dose and the effects of the pollutant (chapter 3). Finally, the risk is characterized by an evaluation of the extent of predicted effects and of the probability of their realization, as a function of exposure (chapter 4).

The necessary data are obtained by various approaches: the occurrence and behaviour of products in air, water and soil are characterized by laboratory assays, measurements made on the land or simulated by mathematical models; the estimation of toxic effects of pollutants is based on the same methods, laboratory studies on different plant or animal species, epidemiological studies of plant, animal, or human populations, or mathematical models.

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Remote Sensing in the 21st Century: Economic and Environmental Applications. J.L. Casanova, editor. A.A. Balkema, Rotterdam and Brookfield, 2000, 610 p. ISBN 90-5809-096-5. Hardcover.

This book contains the proceedings of the 19th Annual Symposium of the European Association of Remote Sensing Laboratories (EARSeL), which was held in Valladolid in 1999. The theme chosen: 'Remote sensing in the 21st Century: economic and environmental applications' reflects one of the principle concerns at the turn of the century, which is how to support economic growth, while at the same time preserving natural resources and our environmental heritage. The papers presented cover almost all the operational applications and developments of remote sensing: Agriculture, Forestry, Yield estimation, Desertification, Geology, Forest fires, Hazards, Hydrology, Meteorology, Oceanography, and New methodologies. Vast amounts of data are reaching the Earth from space, and it is a challenge for the scientific community to convert these data into useful information to meet the manifold requirements in the ever-increasing number of application fields where remote sensing is invaluable.

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Applied Mineralogy in Research, Economy, Technology, Ecology and Culture. D. Rammlmair, J. Mederer, Th.Oberthür, R.B. Heimann and H. Pentinghaus, editors. A.A. Balkema, Rotterdam and Brookfield, 2000, 1090 p. in two volumes. Volume 1: ISBN 90-5809-164-3. Volume 2: ISBN 90-5809-165-1. Set of two volumes: ISBN 90-5809-163-5. Hardcover.

These volumes contain the reviewed plenary papers and extended abstracts of "ICAM 2000", the 6th International Congress on Applied Mineralogy, which took place in Göttingen, Germany, in July 2000. Altogether 270 entries are arranged in the following sections: Plenary lectures (3 papers); Invited lectures (21 papers); Advanced materials, discussing aspects of structure and properties of amorphous materials, zeolites, chemical and physical properties of advanced oxide and sulphide materials, glasses, biomaterials and ceramics (42 papers); Mining and Metallurgy, focussing on mineral deposits, noble metals, platinum and gems (53 papers); Environment, concerning aspects of applied geochemistry, acid mine drainage, nuclear waste management, remediation and immobilization (64 papers); Materials, representing a snapshot on current research in CSH-phases, fibres, cementious materials, clays as well as slags and ashes from thermal waste treatment and energy production (59 papers). Finally, Cultural heritage, including archaeometry and conservation issues (28 papers). All abstracts have a length of 3 or 4 pages. Editors and publishing company are to be congratulated with their accomplishment to have these abstract volumes available at the congress.

Price: EUR 130.00, USD 130.00, GBP 87.00, for two volumes.

Orders to: A.A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, The Netherlands. Fax: +31-10-4135947. E-mail: orders@swets.nl. Homepage: www.balkema.ima.nl. In USA and Canada: A.A. Balkema Publishers, 2252 Ridge Road, Brookfield, VT 05036-9704, USA. Fax: +1-802-276-3837. E-mail: info@ashgate.com.

Sustainable Management of Soil Organic Matter. R.M. Rees, B.C. Ball, C.D. Campbell and C.A. Watson, editors. CABI Publishing, Wallingford, 2001, xx + 440 p. ISBN 0-85199-465-2. Hardcover.

The functioning of soils and their ability to supply nutrients, store water, release greenhouse gases, modify pollutants, resist physical degradation and produce crops within a sustainable management system is profoundly influenced by their organic matter content. This volume has been developed from papers presented at an international conference, held by the British Society of Soil Science in Edinburgh in September 1999. Around 200 delegates from over 20 countries

attended this successful meeting. It contains papers in the following sections: (1) Organic matter and sustainability (2 papers); (2) modelling soil organic matter dynamics – global challenges (6 papers); (3) Soil organic matter management (15 papers); (4) The role of soil organic matter and manures in sustainable nutrient cycling (15 papers); (5) Implications of soil biodiversity for sustainable organic matter management (5 papers); and (6) Soil teeming with life: New frontiers for soil science (1 paper). All sections have an introduction to the issue.
Price: GBP 65.00, USD 120.00.
Orders to: see below.

Nutrient Elements in Grassland. Soil-Plant-Animal Relationships. D.C. Whitehead. CABI Publishing, Wallingford, 2000, xv + 369 p. ISBN 0-85199-437-7. Hardcover.
This book is concerned with the various chemical elements that are nutrients for either plants or animals. Its primary objective is to bring together information, in temperate regions, on the concentrations and main transformations of these elements in the soils, in grassland plants and in ruminant animals. For each element, attention is given to its forms and availability in soils, its uptake and distribution in grassland plants, its role in animal nutrition and the amounts and forms excreted by grazing animals. The influences of soil, plant, weather and management factors on the concentrations of the elements in grassland herbage are described and the concentrations related to the needs of ruminant animals, particularly cattle and sheep. In addition, typical annual balances of the inputs and outputs of each element, on a per hectare basis, are estimated for both intensively managed and extensively managed grassland. The author also wrote Grassland Nitrogen, published by CABI in 1995. (ISBN 0-85198-915-2).
The book will probably be used mainly as a source of reference, and the way in which the chapters are subdivided and the extensive list of more than 60 pages with references are intended to facilitate this type of use.
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Orders to: CABI Publishing, Wallingford Oxon OX10 8DE, UK. Fax: +44-1491-829292. E-mail: orders@cabi.org. Or: CABI Publishing, 10 East 40th Street, Suite 3203, New York, NY 10016, USA. Fax: +1-212-686-7993. E-mail: cabi-nao@cabi-org. Homepage: www.cabi.org.

Food and Forestry: Global Change and Global Challenges. Special Issue of Agriculture Ecosystems & Environment, Vol. 82, nos. 1-3, December 2000. P.J. Gregory and J.S.I. Ingram, guest editors. Elsevier, Amsterdam, 2000, pp. 1-393. ISSN 0167-8809.
This special issue contains selected papers from the Global Change and Terrestrial Ecosystems Core Project (GCTE) Focus 3 Conference, held in Reading in September 1999.
Agricultural and forestry production has a well-established dependence on climate. There is, therefore, growing concern about the potentially wide-ranging impacts that climate change would have on these key industries as the nature and extent of anticipated changes have become more evident. "Global Change" however encompasses far more than change in climate alone. It also includes changes in climate variability and atmospheric composition, and in land use and management. All these are changing in unprecedented ways both in terms of their rate and their spatial extent. Changes in land-use are currently the main manifestation of global change, and these are primarily driven by the increasing demands for agricultural and forest products. Many current land management practices cannot deliver a sustainable supply, let alone increase output, without risking further serious environmental degradation. Meeting anticipated demand will, therefore, be difficult enough with current management, but it will be further complicated by the independent and interactive impacts of other drivers of global change, especially increases in climate variability, land degradation and pollution. Assessment of these impacts on production systems at a range of spatial and temporal scales is central to developing improved systems that can capitalise on the beneficial effects of global change, while avoiding or reducing adverse effects. This will require the development of a strong predictive capability, which is a formidable research challenge. The Focus 3 conference was held to address these issues and the main papers presented are brought together in this special issue. From the papers it is clear that soil scientists have an increasingly large role to play in the multidisciplinary research efforts.
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Principles of Geographic Information Systems. An Introductory Textbook. ITC Educational Textbook Series, 1. R.A. de By, editor. ITC, Enschede, 2000, 230 p. ISBN 90-6164-184-5. ISSN 1567-5777. Softcover.

Principles of Remote Sensing. An Introductory Textbook. ITC Educational Textbook Series, 2. L.L.F. Janssen, editor. ITC, Enschede, 2000, 170 p. ISBN 90-6164-183-7. ISSN 1567-5777. Softcover.
These two publications are written for all students enrolled in the 2000-2001 educational programmes of the International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, The Netherlands. In the 1960's, similar textbooks on remote sensing and other subjects were available for use at ITC. Although developed for the specific ITC student population, these textbooks also received a wide distribution outside the institute. The two publications mentioned were developed in synchrony. They are also available in electronic format, with hyperlinks to pages, references, figures, tables and websites. The electronic version, which can be browsed but not printed, is kept up-to-date.
Included in the documents are a glossary, an index and a bibliography. Both publications are well produced with many colour plates and figures. The electronic document (PDF format) enables fast navigation and quick referencing.

Price per book: NLG 45.00, USD 27.30, EUR 20.38.
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Proceedings 5th EC-GIS Workshop, Stresa, Italy, 28-30 June 1999. K. Fullerton, editor. European Commission, Joint Research Centre, Ispra, 2000, viii + 562 p. Publication EUR 19018 EN. Softcover.
This workshop was organized by the GI&GIS project of the Joint Research Centre (JRC). This project supports the actions to create a European Geographic Infrastructure, encompassing the broad policy, organisational, technical and financial arrangements necessary to support increased access to geographic information in Europe. One of the activities the project is to develop harmonised and coherent multidisciplinary Pan-European databases and analyse spatial information across different sectoral policies and different levels of governmental organisations. This includes the creation of various spatial layers: soil, land cover, agro-meteorology, Natura2000, to support and monitor EU policies.
The present publication contains the texts of the papers given at the workshop "GIS of Tomorrow", reflecting the growing recognition of the important role of GI and GIS in the information society. In addition to presenting GI and GIS projects, there were also more general presentations on European issues relating to the current evolution of GI technologies, standards and markets. A special session was held to prepare a background document for a European Geographic Information Infrastructure. The publication is free of charge.
For information on the GI&GIS project, see homepage: http://gi-gis.aris.sai.jrc.it/.
Requests to: Joint Research Centre, I-21020 Ispra (VA), Italy. Fax: +39-332-789074. Homepage: www.jrc.org.

Integrated Soil Fertility Management. Policy and Best Practice Document 7. T. Hilhorst and C. Toulmin. Development Cooperation, Ministry of Foreign Affairs, The Hague, The Netherlands, 2000, 64 p. ISBN 90-5328-283-1. Softcover.
The Policy and Best Practice Documents are part of the official policy of the Netherlands' Minister for Development Cooperation and provide up-to-date background information on topics that are considered important to its assistance programme. The documents address practical issue in different fields of development and provide guidelines for implementation. The present publication focuses on ways to promote integrated soil fertility management in developing countries, particularly by smallholders working under rainfed conditions. It is the authors' aim to contribute to a more sustainable agriculture, which is vital to achieving food security, poverty alleviation and environmental protection. This guide examines the issues at stake in relation to integrated soil fertility management, the lessons learned from interventions in this field, the reasons why policy makers should be concerned about soil degradation and the type of policies that may contribute to more sustainable management of soils. Available free of charge.
Other policy documents were published about: Sustainable Land Use (1993), Sustainable Irrigated Agriculture (1998), Water for the Future – Integrated Water Resources Management (1998), and Participatory Integrated Pest Management (1999).
Requests to: Ms. Aaltje de Roos, Development Cooperation, Ministry of Foreign Affairs, P.O. Box 20061, 2500 EB The Hague, The Netherlands. Fax: +31-70-3485559. E-mail: aaltje-de.roos@minbuza.nl.

The Rhizosphere. Biochemistry and Organic Substances at the Soil-Plant Interface. Books in Soils, Plants, and the Environment. R. Pinton, Z. Varanini and P. Nannopieri, editors. Marcel Dekker, New York and Basel, 2001, viii + 424 p. ISBN 0- 8247-0427-4. Hardcover.
The research on plant-soil interaction is focused on the processes that take place in the rhizosphere. Many of these processes can control plant growth, microbial infections, and nutrient uptake. Organic compounds released by plant roots and microorganisms dominate the rhizosphere. Furthermore, stable components or soil organic matter, namely, humic and fulvic substances, can influence both plant and microorganism metabolism. A variety of compounds are present in the rhizosphere, and they range from low-molecular-weight root exudates to high-molecular-weight humic substances. The biochemistry and biochemistry of these substances are becoming more and more clear, and their study promises to shed light on the complex interaction between plant and soil microflora. The aim of this book is to provide a comprehensive overview of recent advances in this field and suggest further lines of investigation. As an interdisciplinary approach is necessary to study such a complex matter, the book presents a good opportunity to summarize information concerning agronomy, soil science, plant nutrition, plant physiology, microbiology, and biochemistry. The book is therefore intended for advanced students, and researchers in agricultural, biological and environmental sciences interested in deepening their knowledge of the subject and/or developing new experimental approaches in their specific field of interest.
Price: USD 175.00.
Orders to: see below.

Soil and Environmental Analysis. Physical Methods. Second edition, Revised and Expanded. Books in Soils, Plants, and the Environment. K.A. Smith and Chr. Mullins, editors. Marcel Dekker, New York and Basel, 2001, viii + 637 p. ISBN 0-8247-0414-2. Hardcover.
This is the second edition of Soil Analysis: Physical Methods, published in 1991. It retains all of the topics covered in the first edition. Each chapter has been totally revised, to take into account new developments, and new material has been added, e.g. on the measurement of infiltration, the measurement of soil strength and friability, and field methods of assessment of soil physical conditions. While some topics have undergone relatively little change in terms of the available methods or instrumentation, some have changed considerably. The measurement of soil water, which has such an important role in soil physics and which underwent such a change when the neutron probe was developed,

can now be undertaken with other sophisticated instruments. For example, time domain reflectometry (TDR) and frequency domain systems, which share with the neutron method the desirable feature of allowing non-destructive measurements at the same site to study temporal variations, now provide a reliable alternative to the neutron probe, while avoiding the problems of radiation protection. The widespread availability and use of data loggers has also transformed the approach to many measurements, particularly water content, matric potential, penetrometry, and soil thermal properties, and placed a greater emphasis on the instruments which can be logged. The book is aimed at the researcher or adviser working in environmental science, soil science, or a related field. It is well illustrated with figures.
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Soils of Russia: Correlated with the Revised Legend of the FAO Soil Map of the World and World Reference Base for Soil Resources. IIASA Publication RR-00-13. V. Stolbovoi. International Institute for Applied Systems Analysis, Laxenburg, 2000, xii + 112 p. ISBN 3-7045-0137-9. Softcover.
The FAO-Unesco Soil Map of the World (SMW) at 1:5 M covers also the area of the former Soviet Union, for which new material has become available since the 1970's, when this map was prepared. In 1988 the Soil Map of the Russian Soviet Federative Socialist Republic (SMR) was published at a scale of 1:2.5 M. Although this map is the major inventory at the country scale, it is not widely known. To make it more accessible, a correlation of the SMR legend was made with the Soil Map of the World Revised Legend (1988) and with the World Reference Base for Soil Resources (1998). The present report should be regarded as the explanatory text of the Digital Soil Database for Russia at scale 1:5 M, which was published by FAO as a CD-ROM in 1999.
Orders to: Publications Department, IIASA, A-2361 Laxenburg, Austria. Fax: +43-2236-71313. E-mail: molina@iiasa.ac.at. Homepage: www.iiasa.ac.at.

Land Use, Land-Use Change, and Forestry. A Special Report of the Intergovernmental Panel on Climate Change. R.T. Watson, I.R. Noble, B. Bolin, N.H. Ravindranath, D.J. Verardo and D.J. Dokken, editors. Cambridge University Press, 2000, x + 377 p. ISBN 0-521-80495-7, softcover; ISBN 0-521-80083-8, hardcover.
The exchange of carbon between the atmosphere and biosphere is an important factor in controlling global warming and climate change. Vegetation exchanges carbon dioxide between the atmosphere and the terrestrial biosphere through photosynthesis and plant and soil respiration. This natural exchange has been occurring for hundreds of millions of years, but humans are changing this natural rate of exchange through land use, land-use change, and forestry activities. Consequently, it is important to examine how carbon flows between different pools and how carbon stocks change in response to afforestation, reforestation, and deforestation, and other land-use activities. This report provides a comprehensive, state-of-the-art examination of the scientific and technical implications of carbon sequestration and the global carbon cycle. It also examines environmental and socioeconomic issues, conservation, sustainable resource management and development issues, as related to carbon sequestration. The report also looks forward and examines future carbon uptake and emissions that may result from employing varying definitional scenarios and carbon accounting strategies, linked to the Kyoto Protocol, within the forestry and land-use sectors.
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The Hydrology-Geomorphology Interface: Rainfall, Floods, Sedimentation, Land Use. IAHS Publication no. 261. M.A. Hassan, O. Slaymaker and S.M. Berkowicz, editors. International Association of Hydrological Sciences, Wallingford, 2000, x + 326 p. ISBN 1-901502-16-3. Softcover.
This publication comprises 20 chapters, which derive from a conference at the Hebrew University in May 1999 on the theme of drainage basin processes and morphology. They reflect the complex functioning of the drainage basin sediment cascade and follow the flux of

water and sediment from source to sink. Fluvial geomorphology and related processes in arid areas, and especially those represented in the Negev Desert are in particular focus. The rainfall input to arid geomorphological systems is considered in detail. Understanding of both its temporal and spatial distribution is a prerequisite of successful rainfall-runoff modelling and particularly so for arid systems. Rainfall-runoff modelling and erosion studies in the Negev and also Australia, Slovakia and the USA are reported. Central questions in fluvial geomorphology are addressed including that of the geomorphic effectiveness of high magnitude events such as tropical storms in Baja California, USA, and in India. Geomorphologists have until recently, comparatively neglected the sediment output term, but four contributions provide information about the functioning of drainage basins from lacustrine sedimentary evidence.

The volume is a tribute to the contribution made by Asher Schick to the science of geomorphology, and especially the links between this science and hydrology.

Price: GBP 49.00, including packing and postage by surface mail.

Orders to: see below.

The Role of Erosion and Sediment Transport in Nutrient and Contaminant Transfer. IAHS Publication no. 263. M. Stone, editor. International Association of Hydrological Sciences, Wallingford, 2000, xii + 308 p. ISBN 1-901502-26-0. Softcover.

Increasing awareness of the effects of sediment-associated chemical transfer on water quality and ecosystem health has raised concern for the sustainable use of water resources worldwide. The rates and magnitudes of nutrient and contaminant transfer vary in space and time according to the nature of the erosion processes, sediment sources and conveyance, and in-stream processes. Information regarding the spatial and temporal variation of sediment sources as well as sediment properties and environmental factors affecting transport processes is required for modelling of sediment-associated nutrient and contaminant transfer to enable planning and management for the sustainable use of water resources.

This publication comprises the proceedings of the International Symposium on the Role of Erosion and Sediment Transport in Nutrient and Contaminant Transfer, held at Waterloo, Canada, in July 2000.

Price: GBP 48.00, including packing and postage by surface mail.

Orders to: Mrs. Jill Gash, IAHS Press, Centre for Ecology and Hydrology, Wallingford, Oxfordshire OX10 8BB, UK. Fax: +44-1491-692448. E-mail: jilly@iahs.demon.co.uk. Homepage: www.cig.ensmp.fr.

Land use systems research on strongly weathered soils in south and south-east Brazil. M. van den Berg. Thesis, University Utrecht. Netherlands Geographical Studies no. 271, 2000, 250 p. ISBN 90-6809-296-0. ISSN 0169-4839. Softcover.

Strongly weathered red-yellow and dusky red soils occupy large areas in the tropics, predominantly in Latin America and Africa. They usually occur under natural rainforest, wood and savanna-like vegetation. Another large part is used for crop production and grazing, with low yield levels. Textbooks frequently characterize these soils as chemically extremely poor and having a small available water capacity, resulting in relatively large yield declines as a consequence of short periods of drought. In previous decades, especially in Brazil, it has been shown that many of these soils can produce excellent yields if they are limed and properly fertilized. This has caused agricultural intensification and an enormous expansion of agricultural land use. Negative consequences are the accelerated destruction of natural ecosystems and soil degradation. Several attempts to undertake profitable agriculture in the Amazon region have failed completely. The principal objectives of the present study were: (1) to increase the knowledge of the agricultural properties of strongly weathered soils and their spatial variability, and (2) to explore the potential of existing, or somewhat adapted means and methodologies to assess biophysically obtainable production levels of land use systems envisaged on these soils. The study is based on research carried out in the states of São Paulo and Rio Grande do Sul.

Price: NLG 53.50, including packing and postage by surface mail.

Orders to: Netherlands Geographical Studies, P.O. Box 80123, 3508 TC Utrecht, The Netherlands. Fax: +31-30-253-5523. E-mail: knag@geog.uu.nl.

Nature Farming and Microbial Applications. H. Xu, J.F. Parr and H. Umemura, editors. Food Products Press, New York, London, 2000, xvi + 402 p. ISBN 1-56022-082-1, hardcover; 1-56022-082-X, softcover.

Recent concerns about environmental pollution and food quality degradation by excessive input of chemicals have prompted scientists and policy-makers to reevaluate our modern agriculture and find alternatives to produce safe and nutritious food and protect our environment. In this regard, there is a growing interest in organic farming or nature farming. To foster the Japanese and worldwide organic agriculture movement, the International Nature Farming Research Center was founded. This publication, also issued as Journal of Crop Production, vol. 3, no. 1, summarizes the research achievements by scientists at this center and elsewhere in Japan and other countries, mainly China. The papers are grouped into Nature Farming (12 papers), and Microbial Applications (18 papers). The first section covers the historical aspects of nature farming and some examples of classical farming practices. The second section reports on organic farming and applications of organic fertilizers and microbial products and environmental protection. Some papers present original methodologies, including mathematical and physical modeling, to analyse photosynthesis, transpiration, plant-water relations and stress resistance of crops.

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Feeding the World. A Challenge for the Twenty-first Century. V. Smil. The MIT Press, Cambridge, 2000, 390 p. ISBN 0-262-19432-5. Hardcover.
This book addresses the question of how we can best feed the ten billion or so people who will likely inhabit the Earth by the middle of this century. Can human ingenuity produce enough food to support healthy and vigorous lives for all the people without irreparably damaging the integrity of the biosphere? The book considers the complete food cycle: from agriculture to post-harvest losses and processing to eating and discarding. The author shows how we can make more effective use of current resources and suggests that if we increase farming efficiency, reduce waste, and transform our diets, future needs may not as great as we anticipate. It is concluded that there are no insurmountable biophysical reasons we cannot feed humanity in the decades to come, while easing the burden that modern agriculture puts on the biosphere.
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Agricultural Expansion and Tropical Deforestation. Poverty, International Trade and Land Use. S.L. Barraclough and K.B Ghimire. Earthscan, London, 2000, 200 p. ISBN 1-85383-665-6, softcover; 1-85383-666-4, hardcover.
The authors state that there is no clearcut causal relationship between international trade, agricultural expansion and tropical deforestation. Academics, policy makers and the public are all tempted by simplistic solutions to complex problems. In order to establish the true causal factors involved in this critical area of environmental decline, the authors present case studies from five countries: Brazil, Guatemala, Cameroon, China and Malaysia. It is shown that the focus of analysis must be applied as much to the misguided policies of national and regional authorities and issues such as systems of land tenure as to the forces of trade and globalization. The primary aim of this book is to highlight the need to seek solutions in far-reaching institutional and policy reforms adapted to specific socioeconomic and ecological contexts if the challenge of tropical deforestation is to be tackled effectively.
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Orders to: Earthscan agents worldwide, or: Littlehampton Book Services, P.O. Box 53, Littlehampton, BN17 7BU, UK. Fax: +44-20-7278-1142. E-mail: kpinfo@kogan-page.co.uk. Homepage: www.earthscan.co.uk.

Integrating Concepts of Sustainability into Education for Agriculture and Rural Development. Environmental Education, Communication and Sustainability vol. 6. W. van de Bor, P. Holen, A. Wals and W Leal Filho, editors. Peter Lang Europäischer Verlag der Wissenschaften, Frankfurt am Main, Berlin, 2000, 329 p. ISBN 3-631-36425-3. US-ISBN 0-8204-4763-3. ISSN 1434-3819. Softcover.
This book focusses on the concept of sustainability in higher agricultural education. Although not a new topic, sustainability as an issue for the agricultural industry, agricultural research and agricultural education has clearly gained momentum over the last years. The number of teachers, academics and policy makers facing concepts of sustainability on the one hand, and changing curricula on the other, is growing rapidly. This book bridges the conceptualization of sustainability issues and the integration of these issues in teaching and learning practices in higher education. The book builds upon a workshop held in 1998 on the same subject, and it was decided to extend its outcome with experiences and thoughts of other persons engaged in higher education, and publish it for a wider audience. The workshop was developed within the framework of the Thematic Network for Agriculture, Forestry, Aquaculture and Related Sciences (AFANet – see the homepage: www.clues.abdn.ac.uk:8080/demeter/). The aim of AFANet is to promote a European dimension to higher education in universities and colleges offering degree programmes in these sciences. At the discipline level, AFANet considers future educational needs of the agricultural, aquacultural and forestry industries, develops courses which focus on providing students with a European perspective to their studies, and initiates discussions on how curricula need to develop to meet changing circumstances and our improved understanding in the world in which we live. The workshop was developed to address the issue of sustainability within the latter context of curriculum development. The collection of papers, from various disciplines, offer challenging viewpoints with regard to the integration of sustainability in higher education and provides a wide range of concrete examples of how such integration is being realised in institutes around the world.
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Rethinking soil and water conservation in a changing society, a case study in eastern Burkina Faso. V. Mazzucato and D. Niemeijer. Tropical Resource Management Papers 32. Wageningen University and Research Centre, 2000, xxii + 380 p. ISBN 90-6754-596-1. ISSN 0926-9495. Softcover.
Soil and conservation projects have had limited success in Africa despite various intervention approaches tried throughout the 20th century. The lack of success highlights the fact that there is a need for new ways through which to study soil and water conservation. This study argues that soil and water conservation is a complex issue in need of an integrated approach. It first analyses the evidence of land degradation, the raison d'être of soil and water conservation technologies, in the research area and the country as a whole, by looking at the indicators and proxies that are used in land degradation narratives. It then analyses how farmers conserve land and water and why they do it in the way they do. Analyzing the technologies that farmers use, the economic principles that guide their allocative decisions, as well as their social institutions that mediate

access to resources necessary for an environmentally sustainable system, looks at these questions. Special attention is given to how both technologies and institutions have changed over time in reaction to changes in the social, economic and environmental contexts in which agriculture is practiced.
The study found no evidence of land degradation in the research area. Farmers were found to have intensified their agricultural systems in ways that are often ignored by studies on soil and water conservation. Through adaptive management of their agricultural practices, as well as through changes in their social organization around the land, farmers react to changing social, economic, and environmental contexts to make their system more productive and environmentally sustainable. Consequently, this study suggests that forms of intensification in African production systems can best be understood through analytical frameworks that focus on the interplay of social and environmental histories, rather than assume a simple trend towards increasing land degradation. The study offers an example of such an analytical framework and how it can be operationalized, leading to innovative perspectives on African land use systems.
Orders to: Wageningen UR, Department of Environmental Sciences, Erosion and Soil and Water Conservation Group, Nieuwe Kanaal 11, 6709 PA Wageningen, The Netherlands. Fax: +31-317-484759.

Soil – Structure interaction in urban civil engineering. Proceedings of the Workshop, Thessaloniki, 1 and 2 October 1999. A. Avdelas, editor. COST Action C7. Directorate-General for Research, European Commission. European Communities, Luxembourg, 2000, ix + 169 p. ISBN 92-828-9533-5. EUR 19206. Softcover.
The COST C7 Action started in 1996. Several countries were eager to come up with practical recommendations for how to take soil-structure interaction effect in large civil engineering projects in urban areas. The formulated objectives were to make recommendations as comprehensive as possible in a European dimension. They should correspond to the state of the art technology and be so formulated that not only the specialists, but also all professionals involved in the planning and design of structures could read them and take them into account. This report contains the proceedings of a meeting held in 1999, the papers being arranged in the four COST C7 Working Groups: Advanced numerical analysis; Interaction between structural and geotechnical engineers; Field measurements and case histories; and Geotechnical and environmental engineering for urban planning. For updates of the work, which will be completed in 2002, see homepage: www.vtt.fi/rte/projects/yki4/cost/costk.htm. For information on the COST Action C7: Dr. F. Charmaison, European Commission, DG for Research, Unit AP/2 - COST, Wetstraat 200, B-1049 Brussels, Belgium. Fax: +32-2-296-42-89. E-mail: Franck.Charmaison@cec.eu.int.
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Multi-scale land use modelling with the CLUE Modelling Framework. G.H.J. Koning, A. Veldkamp, K. Kok, N. de Ridder, L.O. Fresco and J. Schoorl. Dutch National Research Programme on Global Air Pollution and Climate Change, Bilthoven, 2000, 155 p. ISBN 90-5851-034-4. Report number 410 200 053 (2000). Softcover.
Land Use and Land Cover Change (LULCC) plays an important role in global climate change. It influences water and energy balances and can be both a source and a sink of greenhouse gases. Deforestation causes CO2 emissions, while on the other hand important quantities of carbon can be sequestered in above and below ground organic matter in terrestrial (agro)ecosystems. For global change policies it is relevant to include information of LULCC, as it contributes to global change but also offers possibilities for mitigation measures. In order to be able to describe and analyse possible LULCC in the near future, modelling approaches are necessary that can be used for scenario analysis. The Conversion of Land Use and its Effects (CLUE) model was developed, and is being presented and discussed in this publication. The model uses quantitative information as the main drivers of land use change at different spatial scales, derived from historical and actual land use patterns. This information is integrated in a spatially explicit dynamic modelling procedure in which near future land use changes are simulated for different scenarios. In these scenarios (inter)national developments can be evaluated, such as changing national demands for food, market liberalisation or nature protection, but also regional and local developments like migration and land degradation. The model was applied in several countries in Central and South America and in Asia. It is shown that it is important to include LULCC in global climate change policies, and the CLUE model can play an important role in supporting these policies. For information about the CLUE model, contact Dr. K. Kok, International Centre for Integrative Studies (ICIS), P.O. Box 616, 6200 MD Maastricht, The Netherlands. E-mail: k.kok@icis.unimaas.nl.
Requests to: Ir. G.J. Heij, Programme Office NRP, P.O. Box 1, 3729 BA Bilthoven, The Netherlands. Fax: +31-30-2744436. E-mail: nopsecr@rivm.nl. Homepage: www.nop.nl.

Scaling the Land Use System. A modelling approach with case studies for Central America. K. Kok. PhD thesis, Wageningen University, 2001, vii + 155 p. ISBN 90-5808-355-1. Softcover.
This thesis describes and discusses the application of a land use change model that quantitatively accounts for various aspects of 'scale'. The unique aspect of the model is its aim to apply a multi-scale methodology as opposed to a theoretical elaboration on the existence of the 'scale-effect'. The overall objective of this project is to analyse the scale sensitivity of land use modelling. It is also shown how different parts of the model function, how model results can be interpreted and validation results be discussed. The thesis applies the land use change model to Central America, in which main land use change processes are in many ways complementary to particularly the study areas of Verburg (China and

Java), which are presented in his thesis. (P.H. Verburg. Exploring the spatial and temporal dynamics of land use, Wageningen University, 2000). The main reaction of land use in Central America to the fast growing demand for agricultural products is an area expansion, which results in a continuing deforestation. Past, present and future developments of land use and its drivers are discussed. The thesis is intended to add to the general understanding of modelling the land use system, and will keep alive the discussion about how to model land use best.
Another related thesis is G.H.J. de Koning. Spatially explicit analysis of land use change: a case study for Ecuador. Wageningen University, 1999.
Requests to: Dr. K. Kok, International Centre for Integrative Studies (ICIS), P.O. Box 616, 6200 MD Maastricht, The Netherlands. E-mail: k.kok@icis.unimaas.nl.

Case Studies of Rangeland Desertification. Proceedings from an international workshop in Iceland. Rala Report 200. O. Arnalds and S. Archer, editors. Agricultural Research Institute, Reykjavik, 1999, 149 p. ISSN 1010-0121.
The ever-increasing demand for food by a rapidly growing population has exerted environmental stress resulting in widespread ecosystems degradation. An extreme form of such degradation is desertification, which affects the living conditions of about one billion people. As a result, this topic spawned the U.N. Convention to Combat Desertification (UN-CCD). Desertification has occurred in most regions of the world, cutting across a broad spectrum of contrasts in climate, ecosystem types, land uses and socio/economic settings. The complexity of this phenomenon has challenges our ability to categorize, inventory, monitor and repair the condition of the land. The improper, incomplete or out-of-context transfer of knowledge from one region or land use category to another magnifies shortcomings in communication and understanding. One of the most important distinctions to be made in relation to land degradation is between cultivated land used for annual crop production and rangelands. Rangelands represent a variety of ecosystems and landforms not suited for intensive agriculture or forestry, because of limitations imposed by climate, soils, or topography. Issues relevant to rangeland desertification around the world were discussed at a workshop in Reykjavik, Iceland, in 1997, and the present publication contains a compilation of the presented case studies as well as the conclusions reached.
The other outcome is the book Rangeland Desertification (see next review)
Requests to: Dr. O. Arnalds, Agricultural Research Institute (RALA), Keldnaholt, IS-112 Reykjavik, Iceland. Fax: +354-577-1020. E-mail: ola@rala.is

Rangeland Desertification. Advances in Vegetation Science 19. O. Arnalds and S. Archer. Kluwer Academic Publishers, Dordrecht, Boston, 2000, x + 209 p. ISBN 0-7923-6071-0. Hardcover.
As mentioned above, this book is a part of the outcome of a workshop, held in Iceland in 1997. The papers in this volume focus on concepts and principles of rangeland desertification. The chapters in the first section explore the spatial and temporal aspects of disturbance interactions, thresholds and non-linear change with respect to vegetation, hydrology, nutrient cycling and erosion. Chapters in the second section are dedicated to socio-economic constraints, remedies and approaches for preventing and reversing degradation. It begins with an overview of the United Nations databases on desertification, followed by chapters discussing approaches for implementing conservation practices. A concluding chapter shows how environmental accountability can be woven into the policy and law of a society. Reversal of the effects of desertification is most difficult in countries with limited resources. One chapter articulates the problems facing developing countries; another describes the constraints to implementing the articles of the UN-CCD in Africa.
The book provides a contemporary, process-oriented perspective on rangeland degradation, which is of value to students, policy-makers and professionals.
Price: EUR 81.50, USD 95.50, GBP 59.50.
Orders to: see below.

GIS and Remote Sensing Techniques in Land- and Water-management. A. van Dijk and M.G. Bos, editors. Kluwer Academic Publishers, Dordrecht, Boston, 2001, ix + 92 p. ISBN 0-7923-6788-X. Hardcover.
Managing land and water is a complex affair and man has constantly to make decisions to allocate and use these natural resources. Decision and action in any use of resources often have strong interactions and side effects on others, and it is therefore important to forecast and monitor the impacts of the decisions. Compulsory for forecasting and monitoring are reliable information and clear data manipulation procedures. Remote sending has considerable potential to provide reliable information, while GIS is an easy tool to manipulate and analyse the data. This book describes in seven practical examples how GIS and remote sensing techniques are applied in land- and water-management successfully.
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Tools for Land Use Analysis on Different Scales. With Case Studies for Costa Rica. System Approaches for Sustainable Agriculture Development, volume 8. B.A.M. Bouman, H.G.J. Jansen, R.A. Schipper, H. Hengstdijk en A. Nieuwenhuyse, editors. Kluwer Academic Publishers, Dordrecht, Boston, 2000, ix + 274 p. ISBN 0-7923-6479-1. Hardcover. With CD-ROM.
Regional development is intrinsically related to the way in which the land is used. Given the rising awareness of the multifunctionality of the world's land resources, policy makers now face the complex task of accommodating multiple objectives of an increasing number of stakeholders in regional development. This implies a need for tools that can be employed to provide insights into the opportunities and limitations to land use. Those tools should be capable of quantifying trade-offs between socio-economic, sustainability and environment-related policy objectives. This book offers a

detailed account of a range of interdisciplinary methodologies for land use analysis, developed over a twelve year period (1986-1998) in Costa Rica through collaborative research of Wageningen University, The Netherlands, the Tropical Agriculture Research and Higher Education Centre (CATIE) and the Ministry of Agriculture and Livestock, both in Costa Rica. The methodologies span a number of spatial scales, ranging from the field level to the national level. Concepts of systems analysis and information technology play a pivotal role in each of these technologies. Together, they form a unique toolbox that deserves ample use in the process of agricultural policy design. The CD-ROM contains a practical account of the methodologies presented in the book, including a full documentation of models, manuals, a number of introductory exercises, as well as previously unavailable data sets. The CD-ROM offers an opportunity for familiarization with the methodologies by students, research specialists and decision-makers alike.
Price: NLG 240.00, USD 118.00, GBP 74.50.
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Observing Land from Space: Science, Customers and Technology. Advances in Global Change Research 4. M.M. Verstraete, M. Menenti and J. Peltoniemi, editors. Kluwer Academic Publishers, Dordrecht, Boston, 2000, vii + 341 p. ISBN 0-7923-6503-8. Hardcover.
The European Network for the development of Advanced Models to interpret Optical Remote Sensing data over terrestrial environments (ENAMORS) is a consortium of academic and research institutions involved in methodological research and in applications of remote sensing techniques for earth observation. Its activities include the organization of conferences, *the first of which took place in Tuusula, Finland*, in September 1997. This meeting assembled scientists, engineers, users and policy-makers, and provided a forum to debate scientific priorities, technological opportunities and information requirements. This fourth volume in the series Advances in Global Change Research contains the proceedings of the meeting in Finland and summarizes the discussions and the conclusions reached. It offers in 30 papers a broad overview of the science and technology or remote sensing, its policy applications and the needs of operational users in the context of climate change and environmental degradation over land.
For information about ENAMORS see its homepage www.enamors.org. For information about the Centre for Earth Observation see its homepage www.ceo.org.
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Methane emissions from rice paddies; experiments and modelling. P. M. van Bodegom. PhD thesis, Wageningen University, 2000, 215 p. ISBN 90-5808-283-0. Softcover.
This thesis describes model development and experimentation on the comprehension and prediction of methane emissions from rice paddies. The large temporal variability in these emissions and the dynamic non-linear relationships between processes underlying these emissions impairs the applicability of empirical relations. Mechanistic concepts are therefore the starting point of analysis throughout the thesis. The process of methane production was investigated by soil slurry incubation experiments at different temperatures and with additions of different electron donors or acceptors. The experiments were sued to calibrate and validate a mechanistic model on methane production that describes competition for acetate and H2/CO2, inhibition effects and chemolithotrophic reactions. The redox sequence leading eventually to methane production was well predicted by the model, calibrating only the maximum conversion rates. The field scale model was validated by independent methane emission measurements in the Philippines, China and Indonesia. The model predicted methane emissions well with only few generally available sit-specific input parameters. The field scale model was coupled to a Geographic Information System to scale up regional emissions from rice paddies. It appears that data availability and not model uncertainty limits the upscaling process from rice paddies to regions.
Requests to: Dr. P. van Bodegom, Department of Systems Ecology, Free University, De Boelelaan 1087, 1081 HV Amsterdam, The Netherlands. Homepage: www.bo.vu.nl/html/systems_ecology.html.

Technical and Social Systems Approaches for Sustainable Rural Development. W. Doppler and J. Calatrava, *editors*. Margraf Verlag, Weikersheim, 2000, x + 380 p. ISBN 3-8236-1332-4. Softcover.
The European Group of the International Farming Systems Association (IFSA) offers a forum for discussions on different systems approaches in farming and rural development. The main activity is the organisation of European Symposia. The present volume contains the Proceedings of the Second European Symposium of the Association of Farming Systems Research and Extension, held in Granada in 1996. Papers were presented in the following sections: (1) Setting the frame: sustainable farming and rural development (5 papers); (2) Designing sustainable agro-ecological systems (15 papers); (3) Integrating social and technical perspectives in natural resource management (11 papers); (4) Making the most of agri-ecological diversity and local knowledge (9 papers); (5) Policy and institutional development (8 papers); and (6) Training (6 papers).
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Ecotoxicologie Appliqueé. J. Römbke et J.F. Moltmann. Margraf Verlag, Weikersheim, 2000, ix + 324 p. ISBN 3-8236-1336-7.
La mission de l'écotoxicologie est d'évaluer, de surveiller er de prévoir le devenir et les effets des substances dans l'environnement. L'objectif de l'écotoxi-

cologie est de fournir une base scientifique pouvant permettre l'estimation de ces substances avec un effort et des coûts raisonnable. En retour, ceci fournit une base pour des évaluations en vue de décider des substances qui peuvent être libérées ou tolérées par l'environnement, et dans quelles quantités. L'écotoxicologie est devenue nécessaire lorsque l'homme a commencé à introduire des produits chimiques dans l'environnement. Personne ne s'était préoccupé du devenir de ces produits chimiques jusqu'au moment où ils ont commencé à se manifester dans des endroits inattendus, ou lorsqu'ils ont eu des effets néfastes sur les organismes vivant dans l'environnement. Certains substances ont des effets immédiates, néfastes, tandis que d'autres peuvent avoir des impacts qui ne se manifestes que plus tard, par exemple lorsque la population animale ou végétale décroit, à la suite d'une baisse de fertilité. L'écotoxicolgie est aussi devenue nécessaire lorque beaucoup de nouvelles substances qui, á l'origine n'existaient pas dans la nature ont été synthétisées. La plupart de ces substances artificielles ont des effets notables, mêmes lorsqu'elles sont fortement diluées.
Dans treize chapitres cette publication donne des renseignements sur les aspects diverses de l'écotoxicologie.
Prix: DEM 70.00, EUR 35.00.
Commandes à: voir en bas.

Rural and Farming Systems Analyses: Environmental Perspectives. W. Doppler and A. Koutsouris, editors. Margraf Verlag, Weikersheim, 1999, vii + 382 p. ISBN 3-8236-1320-0. Softcover.
This book forms the proceedings of the Third European Symposium of the Association of Farming Systems Research and Extension, which was held in Hohenheim in March 1998. The volume has an introductory chapter about the framework of this symposium and papers in the following sections: (1) Concepts and approaches for integrating environmental perspectives (7 papers); (2) Management strategies for coping with the environment (5 papers); (3) Use of local resources for rural development (5 papers); (4) The role of institutions in managing ecosystems (6 papers); and Farming and rural systems in zones of transition (8 papers).
Common results of the discussions in the three symposia held to date on these issues make clear that rural and farming systems analysis is based on the systems philosophy. The history of rural and farming systems research shows an increasing effort in taking into consideration farmers' and rural people's conditions and development aspects and involve a wide range of disciplines. The discussions have shown that rural and farming systems research provides a basis and forum for different views of different disciplines never offered by mono-disciplinary discussions and shows ways to integrate them.
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Modelling of Transport Processes in Soils at various scales in time and space. J. Feijen and K. Wiyo, editors. International Workshop of EurAgEng's Field of Interest on Soil and Water, Leuven, 24-26 November 1999. Wageningen Pers, Wageningen, 1999, 786 p. ISBN 90-74134-76-9. Softcover.
The soil protects to varying degrees the underlying aquifers. The climate, land use and the soil properties determine the amount of fresh water and chemicals that seep into the underground. A good understanding of the filtering and cleaning capacity of the soil is of paramount importance for assessing the vulnerability of the underlying aquifers. This understanding is a must to better define policies for land use, the use of chemicals and the dumping of wastes. To discuss these issues, a workshop was organised under the auspices of EurAgEng's Field of Interest on Soil and Water. These proceedings include the texts of the keynote papers and oral and poster presentations in the following sections: (1) Modelling transport processes at the local level (9 papers); (2) Characterisation of pore structure (8 papers); (3) Measurement techniques for local-scale transport parameters (17 papers); (4) Processes determining water flow and transport of nitrates, phosphates, heavy metals and pesticides in spatially variable field soils (11 papers); (5) Effects of plants on the upper boundary condition (4 papers); (6) Inverse optimization, calibration and validity of simulation models (5 papers); (7) Determination of field-scale parameters by upscaling local-scale parameters (4 papers); (8) Application of modelling at field-scale (7 papers); (9) Processes determining water flow and transport of nitrates, phosphates, heavy metals and pesticides at the regional scale (5 papers); (10) Determination of critical parameters for transport processes at the regional-scale (2 papers); (11) Determination of grid-scale parameters by upscaling local-scale parameters (5 Papers); (12) Obtaining model parameters, boundary and initial parameters from secondary and soft information (5 papers); and (13) Application of modelling at regional scale (8 papers).
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Laboratory Design, Construction, and Renovation. Participants, Process, and Product. Board on Chemical Sciences and Technology, National Research Council. National Academy Press, Washington, D.C., 2000, xii + 156 p. ISBN 0-309-06633-6. Softcover.
In response to concerns of the community of users and administrators of research facilities in the USA, a committee was appointed by the National Research Council (NRC) to provide guidance on effective approaches for building laboratory facilities in the chemical and biochemical sciences. All of the members of the committee shared the community's concern about the problems of building laboratory facilities. At the end, the

committee arrived at a consensus and decided to focus on how to have a successful laboratory facility designed and built, not on the details of laboratory construction. This study does not duplicate the numerous other publications on laboratory construction, which are mentioned in the bibliography. It is the committee's hope that scientists-users, institutional administrators and managers will use this report to become informed users of design services and that the professional design community will use the report to enhance its ability to interact with its clients.
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Reclamation of Drastically Disturbed Lands. Agronomy series number 41. R.I. Barnhisel, R.G. Darmody and W.L. Daniels, editorial committee. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, 2000, xxiii + 1082 p. ISBN 0-89118-146-6. Hardcover.
The first edition of this book, published under the same title in 1978, was a compilation of papers presented at a symposium. It was mainly concerned with land disturbed by mining, especially coal. In the United States, the passage of the Surface Mining Control and Reclamation Act in 1977 significantly affected reclamation regulations and procedures. Since the first edition, a number of new technologies and management practices have been introduced which enhance reclamation and cost efficiency, and can ultimately provide economic benefits to society. These, as well as other advances in land reclamation, are included in this second edition. Reclamation is not just controlling erosion and vegetating land surfaces following coal mining, but may include all types of physical disturbance of soils and landscapes. A few chapters have been added to address other scenarios of land reclamation that were not addressed before. It does not include reclamation or rehabilitation of lands affected by salts, or by wind and water erosion. Largely, the monograph was restricted to lands directly affected by large-scale disturbing actions from mining or construction activities such as roads and pipelines. It also includes a chapter on the reclamation of mine tailings.
This second edition will be very useful to professionals and students, also outside the United States.
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Land Application of Agricultural, Industrial, and Municipal By-Products. SSSA Book Series: 6. J.F. Power and W.A. Dick, editors. Soil Science Society of America, Madison, 2000, xix + 653 p. ISBN 0-89118-834-7. Hardcover.
Environmental quality is one of the major issues and concerns worldwide. Of particular importance is the protection and sustainability of valuable soil and water resources. With increasing human populations, concentrated animal production areas, and expanding industries, safe disposal of by-product materials is becoming a greater challenge. Often, agricultural, industrial, and municipal by-products are applied to land. While they can be beneficial to plants and soils, there can be negative impacts on soil, water, and air quality. The application of by-products to land will be an important issue in decades to come. In 1995, the Soil Science Society of America appointed an Organizing Committee to investigate the need and feasibility of publishing a comprehensive monograph on these issues. This Committee recommended proceeding with the development and production of the present monograph, for which an Editorial Committee was selected. Authors presented their chapters at the 1997 Annual Meeting of the SSSA. The chapters address most of the major concerns associated with the application of various by-products to land. The fundamental processes involved in recycling by-products through land application are discussed, providing the reader with a basic understanding of the science involved. Problems and potential benefits from land application are outlined. Finally, a number of successful land application technologies and programs are presented. The chapters of this monograph are designed to provide readers with a comprehensive reference source on land application of by-products materials.
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Physical and Chemical Processes of Water and Solute Transport/Retention in Soils. SSSA Special Publication number 56. H.M. Selim and D.L. Sparks, editors. Soil Science Society of America, Madison, 2001, 280 p. ISBN 0-89118-835-5. Softcover.
The subject of water and solute transport in porous media is one of the most fascinating areas of science. Tremendous advances have been recently made in understanding the soil physical/chemical processes of water and solute transport/retention in soils. The transport and retention of water, nutrients, and inorganic and organic contaminants in the environment is greatly affected by physical and chemical processes and reactions in porous media such as soils. To understand and model these processes/reactions, it is important that multiple scales – ranging from the landscape to the molecular – be investigated. Over the past decade numerous developments at multiple scales, have occurred in the soil, physical, and environmental sciences. These developments, which are discussed in this book, include: employment of fractal and spatial heterogeneity analyses in describing transport phenomena; development of sophisticated molecular models; use of in situ spectroscopic and microscopic techniques to elucidate reaction mechanisms and models in soils; and, inclusion of time-dependent phenomena in predicting solute transport/retention is soils. This publication presents the state-of-the-art on physicochemical processes of water/solute transport/retention.
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Soil Carbon Sequestration and the Greenhouse Effect. SSSA Special Publication number 57. R. Lal,

editor. Soil Science Society of America, Madison, 2001, xvii + 236 p. ISBN 0-89118-836-3. Softcover.
There is concern worldwide about increases in greenhouse gases and their potential effects on global climatic change. Carbon dioxide is increasing in the atmosphere due to fossil fuel combustion, cement manufacture, deforestation, land use change, and agricultural activities. Several attempts at balancing the global C budget have pointed out the so-called "missing C". Some have attributed this "missing C" to absorption by the terrestrial ecosystems, primarily in North America. It is apparent, therefore, that terrestrial ecosystems in general, but world soils in particular, play an important role in the global C cycle. Depending upon land use, farming or cropping systems, tillage method, or other soil management practices, soil can be a major source or sink for the atmospheric CO2. There are several land uses, farming systems, and management practices that render soil as a net sink for the atmospheric CO2. Such land uses and management practices are specific to soils and ecoregions, and need to be validated and adapted for site-specific situations. Further, the rates of soil C sequestration with recommended management practices also differ among soil types and conditions, and need to be determined. The importance of the strategy of soil C sequestration cannot be overemphasized. At present, it is the most cost-effective short-term option of reducing the emission of CO2 into the atmosphere. Further, enhancement of soil organic C has numerous ancillary benefits, including improvement in soil structure, increase in soil buffering and water and nutrient retention capabilities, decrease in risks of soil erosion, and increase in agronomic productivity. Soil C sequestration is a byproduct of recommended agricultural practices for achieving food security. This publication delivers research information on soil C sequestration from croplands, rangelands, and set-aside lands in North America.
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Impacts of El Niño and Climate Variability on Agriculture. ASA Special Publication number 63. C. Rosenzweig, K. Boote, S. Hollinger, A. Iglesias and J. Phillips, editorial committee. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, 2001, xvii + 126 p. ISBN 0-89118-148-2. Softcover.
This publication is the proceedings of a symposium held in Beltsville, October 1998. It is evident that seasonal weather at any specific location is strongly influenced by major climate variability systems such as the El Niño-Southern Oscillation and the North Atlantic Oscillation. Predictive models using knowledge of these phenomena have been developed that permit seasonal weather forecasts for regions of the earth. Can these seasonal forecasts be used for decision-making by crop producers? Reasonable accurate climate predictions would allow producers and others to mitigate the negative impacts of El Niño events while attempting to maximize the crop production potential of seasons having favorable rainfall and temperature regimes.
This publication contains papers that evaluate the impacts of climate variability on crop production and the potential of using climate forecasts for enhancing agricultural production.
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Forest Soils and Ecosystem Sustainability. Special Issue Forest Ecology and Management, volume 138, numbers 1-3, November 2000. J.R. Boyle and R.F. Powers, guest editors. Elsevier, Amsterdam, London, 2000, 462 p. ISSN 0378-1127. Softcover.
This special issue of Forest Ecology and Management contains selected and edited papers from the Ninth North American Forest Soils Conference, held at Tahoe City in August 1998.
The papers describe soils as the functioning foundations of potentially sustainable, productive forests managed for many purposes. The volume centers on impacts of both extensive and intensive management, how such impacts can be measured, and how findings can be scaled from small forest plots, to landscapes, or to biomes. The papers provide provocative visions for advancing the science and better understanding of the relevance of forest soils. Most papers have North American authors, but there are also contributions from Australia and New Zealand.
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Shifting Ground. The changing agricultural soils of China and Indonesia. P.H. Lindert. The MIT Press, Cambridge and London, 2001, xii + 351 p. ISBN 0-262-12227-8. Hardcover.
In this book the environmental concerns are evaluated about soil degradation in two very large countries, where anecdotal evidence has suggested serious problems. Using new archival data sets, changes in soil productivity are shown in China and Indonesia over long enough periods to reveal the influence of human activity. These countries are good test case because of their geography and history. China has been at the centre of global concerns about desertification and water erosion, which it may have accelerated through intenseve agriculture. Most of Indonesia's lands were created by volcanoes and erosion, and its rapid deforestation and shifting slash-and-burn agriculture have been singled out for international censure. The author's investigation suggests that human mismanagement is not on average worsening the soil quality in these countries. Human cultivation lowers soil nitrogen and organic matter, but has offsetting positive effects. Beyond the importance of the immediate findings contained in this book, it opens a new area of study – quantitative soil history – and raises the standard for debating soil trends.
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Shades of Green, A review of UK farming systems. P.B. Tinker, editor. Royal Agricultural Society of England, 2000, iv + 100 p. ISBN 0-902629-99-9. Softcover.
Organic farming is a contentious subject. It is growing fast with strong support, but there are many voices that query its long-term value. One cannot judge organic farming on its own; it must be seen in comparison with the alternatives, the most important of which is conventional farming. However, a number of other variants are developing rapidly, based around "Integrated Farming Systems", or "Integrated Cropping Systems". Such agricultural management systems aim to use inputs at minimum levels to produce a good yield, and only when necessary. All other proven procedures which are environment friendly, desirable for animal welfare or directed to ensure high food quality should also be used. There are several such integrated systems, which are less well-defined organic agriculture and depend more upon the judgement and attitudes of the individual farmer. The papers in this publication are mainly concerned with farming systems in the United Kingdom, but they are certainly of value for other regions of the world. It contains a number of interesting soil papers.
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Orders to: Royal Agricultural Society of England, National Agricultural Centre, Stoneleigh Park, Warwickshire CV8 2LZ, England. Fax: +44-24-7669-6900. E-mail: info@rase.org.uk. Homepage: www.rase.org.uk.

Sustainable Forest Management and Global Climate Change. Selected case studies from the Americas. M.H.I. Dore and R. Guevara, editors. Edward Elgar, Cheltenham and Northampton, 2000, xii + 281 p. ISBN 1-84064-161-4. Hardcover.
The UN Framework Convention on Climate Change recognises that, in the formulation of a global strategy for reducing global emissions of carbon (the main factor in global warming) forests could play an important role. This book highlights that role and demonstrates how the forests of the world may be harvested judiciously and sustainably. The authors argue that the forests are more than just a source of timber and wood; they discuss the role that forests play in reducing global warming, in preventing soil erosion and in helping to minimise the loss of biodiversity. Drawing on the expertise of contributors associated with the analysis of forests, this book is an in-depth and fascinating discussion as well as a policy guide for the sustainable management of forests.
The book begins by considering the relevant biophysical aspects of forest management and then goes on to study the value of forests for providing carbon sinks that absorb, in part, the carbon released into the atmosphere through the burning of fossil fuels. The book ends with a more detailed analysis of case studies in forest policy in North, Central and South America, ranging from the boreal forests of North America and the forests of the humid tropics to the forests in the arid regions of South America.
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Chinese Soil Taxonomy. (Revised English version). Cooperative Research Group on Chinese Soil Taxonomy. Science Press, Beijing and New York, 2001, xii + 203 p. ISBN 7-03-008852-2. Softcover.
As a result of 15 years work by the Cooperative Research Group on Chinese Soil Taxonomy, this third version now includes much more detail on the classification of the soils in China, according to both internationally recognised standards as well as the diagnostic horizons and properties as developed in China. It has a special focus on anthropogenic, aridic, alpine, tropical and subtropical soils.
The book also gives information on the development of soil classification in China and the key system down to the subgroup level. A soil map of China at the scale of 1 to 12 million is included, showing the distribution of soils at suborder and great group level. This publication will be valuable for soil scientists and agronomists interested in the soils of this country, and their worldwide relationships.
Requests to: Prof. Zitong Gong or Dr. Ganlin Zhang, Institute of Soil Science, Academy of Sciences, Nanjing 210008, China. Fax: +86-25-3353590. E-mail: glzhang@issas.ac.cn.

Atlas de la Province Extrême-Nord Cameroun. C. Seignobos and O. Iyébi-Mandjek, scientific editors, P. Peltre, CD-ROM. IRD Éditions, Paris and Minrest/INC, Yaoudé, 2000, 171 p. ISBN 2-7099-1444-1.
This very well produced atlas, one of the last regional atlases to cover this West African country, deals with the part north of 10 degrees N, up to Lake Chad, the province called Extreme-North Cameroon. The 39 maps, at a scale of 1:650.000, have the usual scope of human and physical geographical subjects. For soil scientists and agriculturalists, however, there is more than this! There are maps and extensive descriptions of the following subjects: geomorphology, climate, hydrology, hydrogeology, phytogeography, man-induced vegetation, soils and their potential, and the repartition of important crops, e.g. sorghum, groundnuts, rice and cotton. All chapters have a list of references.
Persons with a fast computer can assess the maps and texts via the CD-ROM enclosed in the atlas.
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Pesticide/Soil Interactions. Some current research methods. J. Cornejo and P. James, coordination. Techniques et Pratiques. INRA Éditions, Paris, 2000, 490 p. ISBN 2-7380-0922-0. ISSN 1150-3912. Softcover.
This book is an output of the COST Action 66, entitled:

Fate of Pesticides in the Soil and the Environment, an EU project from 1993 till 1998. It provides research methods and mathematical models for those seeking to understand and to predict the environmental fate of pesticides. It is not an exhaustive catalogue of laboratory tests, outdoor experiments or mathematical models and it does not give definitive answers to evaluate the risks of soil and water pollution. The purpose is rather to gather technical and objective descriptions of some current research methods and mathematical models developed and/or used in Europe. Each method is described in the same way, concentrating on what enables its setting up, on its advantages and drawbacks. The different sections are opened by an introductory chapter to provide the reader with comparison and guidance on the proposed methods. The introductory chapter also gives an overview of the behaviour of the pesticide in soil and environment. This publication might be helpful in drawing up future European guidelines for pesticide registration.
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Shades of Green – a review of UK farming systems. Royal Agricultural Society of England. P.B. Tinker (Ed.), 2000. ISBN: 0-902629-99-9, 101 pages, paperback.
Just what are the merits or disbenefits of the various farming systems within the UK? Is organic farming by definition, intrinsically good? How damaging to the environment is 'conventional', high input agriculture? Does the real future of sustainable farming lie somewhere in the middle with conservation grade or LEAF type systems?
The RASE acknowledges the wide variety of opinions in this area and has published this work to promote informed and robust debate rather than highly polarised and sterile mud slinging.
The authors of each chapter have been guaranteed complete editorial independence. None have strong prior connections with any single agricultural sector or system.
Contents/Contributors:
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Geochemical Atlas of the Slovak Republic - Part V. Soils. Authors: Jan Curlik, Peter Sefcik. Soil Science and Conservation Research Institute, Bratislava (Slovakia) 2000. 99 pages, 83 maps, scale 1:1.000.000.
The project is an organic part of the national programme "Geochemical Atlas of Slovakia". This is Slovakian contribution to the "International Correlation Geological Programme No. 259", approved by UNESCO. The programme was aimed to compilation of geochemical maps and adequate databases - it was coordinated by the Geological Survey of Slovak Republic. The Slovakian national programme, which is fully internationally framed into the international programme, has great significance for recognition of abiotic environmental constituents in the country.
The atlas will be helpful at creation an integrated view on spatial chemical element distribution, geogene and antrophogene conditioned enhanced concentrations, including risk elements remote transport into the soils. This aspect is supported by the presentation some relevant soil characteristics that enable mutual correlation of the contents in relation to soil properties.
The authors hope, the atlas will attract attention of scientific community to the soil as essential part of environment, needs of its conservation, soil degradation processes and their harmful impact on food chain, and water resources quality.
Price: USD 51.00
Orders to: Soil Science and Conservation Research Institute, Gagarinova 10; 82713 Bratislava, Slovak Republic. Fax: +421-7-43427485; E-mail: sci@vupu.sk.

Understanding Soil Change. Soil Sustainability over Millennia, Centuries, and Decades. D.D. Richter, Jr. and D. Markewitz. Cambridge University Press, Cambridge, 2001, xv + 255 p. ISBN 0-521-77171-4. Hardcover.
Humans are increasingly living in urban and suburban environments, away from the land and apart from the soil, yet the quality of human life and the earth's environment has never depended more on soil management than it does today. Humanity's expanding systems of food, fiber, and water production are now entirely dependent on the management practices on several billions of hectares of soils. For these reasons, soil deserves a much greater share of human attention and affection. In the recent words of one scientist, soil is "the central processing unit of the earth's environment." Our understanding of soil's role in the great global cycles of chemical elements lags far behind our impact on these cycles. This book argues that the management of soil at local, regional, and global scales

must continue to improve, but that this improvement is limited by the notable absence of long-term soil experiments from which we can learn about how soils change through time.

This book tells the story of changes in one soil: of the genesis, degradation, and renewal of a soil on a nearly forgotten farm in rural South Carolina, USA. The farm was known for many years as the Old Ray Place, after its colorful owner, Rev. Thomas Ray (1780-1862). The book too explores the particulars of the southern landscape as a way to learn things that are more universal about soil, ecosystems, management, nature, and time. The region was covered with acidic soils with primary hardwood forests until about 1800, changed to long-cultivated cotton, and recently to intensively managed pine forests. These well-documented records significantly enrich the science of ecology and pedology, and provide valuable lessons for land management throughout the world.

The book calls for the establishment of a global network of soil ecosystem studies, to provide further information on sustainable land management, vital as human demands on soil continue to increase.

In their foreword, W.A. Reiners and P.A. Sanchez write: "It is a grand tour of soil change at different temporal scales, done with elegance and scientific rigor. This story will be of interest to ecologists who have never had a soil science course, as well as to advanced pedologists, biogeochemists, agronomists, foresters, and land managers."

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Cover Crops in Smallholder Agriculture. Lessons from Latin America. S. Anderson, S. Gündel and B. Pound, with B. Triomphe. ITDG Publishing, London, 2001, xii + 136 p. ISBN 1-85339-530-7. Softcover.

In the last chapter of this publication, the authors arrive at the following purpose-oriented definition of cover crops: "A cover crop is the live soil-surface cover used as a temporal or spatial component in annual or perennial cropping and agroforestry systems for fulfilling one, or several, purposes including weed management, soil productivity restoration and maintenance, the provision of livestock feed and/or human food, and diversification of income options."

Cover crops have the potential to be an important component in complex, diverse, risk-prone and resource-poor farming situations Lessons learned in Latin America about the use and dissemination of these crops in different agroecosystems deserve to be made widely available to those involved in rural development projects and applied research in English-speaking as well as Spanish-speaking regions. This publication features case studies from four countries in Latin America, which address key issues regarding cover crop integration in smallholder agricultural systems. A wide range of agroecosystems is covered, enabling the information to be adapted for use in other regions. Each chapter addresses a different theme, including: the value of cover crops as food, feed and forage; land husbandry with cover crops; farmer experimentation and diffusion of cover crop innovations; and research strategies for cover crop innovations. The different facets of cover crops cannot be treated separately from each other. The book discusses the crosscutting nature of the various aspects of cover crops and concludes with a discussion of future strategies regarding cover crop integration into smallholder agricultural systems.

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Agro-Silvo-Pastoral Land Use in Sahelian Villages. Advances in Geoecology 33. L. Stroosnijder and T. van Rheenen. Catena Verlag, Reiskirchen, 2001, x + 408 p. ISBN 3-923381-45-X. Hardcover.

Wageningen University began interdisciplinary research in the Sahel in 1975 following alarming signs of drought and the subsequent famine. Results of a biotic study on Primary Production in the Sahel (PPS) carried out in Mali showed that rainfed production of silvopastoral areas with more than 400 mm annual rainfall was constrained by poor availability of plant nutrients. This conclusion was in contrast with the then prevailing public opinion that low rainfall and drought were the main causes of low agricultural productivity and famine. After the PPS study numerous other studies were conducted and training given. Many research documents were synthesized in various books. The aim of these activities was ultimately to raise the standard of living of the rural population by increasing productivity of the silvopastoral areas, the major source of income and security apart from (subsistence) cropping of millet and sorghum. In 1992, Wageningen University formulated and funded a seven-year interdisciplinary research programme on agro-silvo-pastoral land use in Sahelian villages. It is the aim of this book to summarize and synthesize data and observations obtained during this period. A state of the art understanding, and newly developed concepts concerning the actors, natural resources and land use involved, is presented together with the collected information that led to these concepts. The procedure followed to integrate this knowledge is subsequently explained. This approach was then used to derive an answer to the interdisciplinary research question that was the starting point of the research, namely: Under which economic and social conditions are Sahelian villages able and willing to improve the productivity of heir natural resources and subsequently use and manage them sustainably?

The field research was conducted in three provinces in three different socio-ecological zones. Chapter 1 introduces agro-silvo-pastoral land use in Sahelian villages from a systems perspective. In the following three chapters a state of the art understanding concerning actors, natural resources and land use practices is pre-

sented. In chapter 5 the manner in which a land use analysis approach can be used is shown. The Epilogue puts the reader in a reflective mood. What have we learnt? And indeed an even more important question: where do we see challenges ahead? The book is well illustrated; the references are many, both in English and French.
Price: DEM 198.00, USD 141.
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Subsoil Compaction. Distribution, Processes and Consequences. Advances in Geoecology 32. R. Horn, J.H. van den Akker and J. Arvidsson, editors. Catena Verlag, Reiskirchen, 2001, vii + 462 p. ISBN 3-923381-44-1. Hardcover.
Subsoil compaction induced by compression and shearing is characterized as one of the most harmful and persisting degradation phenomena. During the last 3 tot 4 decades not only the mass of the agricultural and forestry machinery has been enlarged 3-4 fold, but also the frequency of wheeling has increased by the same proportion. It is often reported that more than 30 Mha of farmland in Europe are irreversibly degraded by subsoil compaction, while worldwide more than 80 Mha are deformed as a result of such non site and time adjusted agricultural and/or perhaps also forest management strategies. Although many of the effects, which cause e.g. a reduced pentration of roots, infiltration of water, aeration and delayed nutrient adsorption and desorption phenomena, are already well known, often described and partly explained monocausaly, there is still an urgent need to get a more complete insight in the processes and the restrictions to the applied prediction models. Processes inside unsaturated aggregated soils and their pore systems during soil compaction and shearing have to be more completely understood, defined and also related as coupled processes to the changes in physical, chemical and biological properties in the three phase soil systems in order to get more complete process-oriented knowledge and information for defining prevention strategies and recommendation for a site-adjusted and sustainable land use. Especially the discussions about vulnerability, economics, and even climatic (global) change aspects require not only more specific research under defined laboratory and field conditions, but also the intense discussion amongst scientists from various disciplines. These issues were discussed during three workshops in March 1999, and the present book contains a section of the papers and posters presented. These cover the topics: Theory (10 papers); Modeling (11 papers); Properties (17 papers); Distribution (7 papers); and Methods (6 papers). All chapters have a preface.
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Soils of Malaysia. Their Characteristics and Identification. Volume 1. S. Paramananthan. Academy of Sciences Malaysia, Kuala Lumpur and Param Agricultural Soil Surveys, Petaling Jaya, 2000, xiii + 616 p. Softcover.
Although soil surveys have been carried out in Malaysia for over 50 years, little or no attempt has been made to make Standard Descriptions for these soils. Up to now 527 soil series have been established, and this first volume in the series Soils in Malaysia contains 100 such standard descriptions of soils mapped in Peninsular Malaysia, Sabah and Sarawak. This series of books will become a reference manual for those who in some way or other work with soils in Malaysia. The book starts with an introduction to the Malayan soil classification and an overview of the organic and mineral soils occurring in the country. Each standard description presents a representative profile description with analytical data, the range of properties and the differentiating characteristics of the soil. Also mentioned is the prominent land use and remarks on the suitability for agriculture are added. All soils are classified in the Malaysian Soil Taxonomy (1998), the USDA Soil Taxonomy (1998) and the FAO-Unesco Soil Map of the World Revised Legend (1990).
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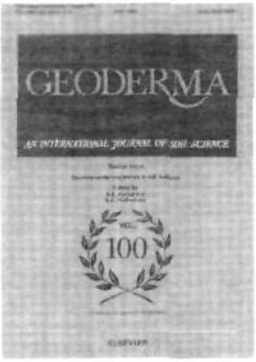

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